Estudio para análisis de falla EAF 005/2016

"Apertura intempestiva del 52A2 S/E Punta de Cortés"

Fecha de Emisión: 28-01-2016

1. Descripción pormenorizada de la perturbación

a. Fecha y Hora de la Falla

Fecha	07-01-2016
Hora	01:13:00

b. Estimación de consumos desconectados

Consumos desconectados (MW)	000043.84

c. Origen de la falla:

Maniobra manual de apertura del 52A2 y 52A3 de S/E P. de Cortés no autorizada por el CDC, que provoca que centrales que inyectan en S/E Tinguiririca quedan generando en isla alimentando los consumos de SS/EE San Fernando y Teno 154 kV, con posterior salida de servicio de centrales y operación EDAC

c.1 Fenómeno físico:

OPE7: Error de personal u operador

La instalación no ha sido afectada por este fenómeno físico en el período de un año calendario

c.2 Elemento donde se produjo la falla:

PR6: Interruptores

c.3 Fenómeno eléctrico:

FR81: Frecuencia

c.4 Modo (comportamiento de interruptores principales):

13: Opera según lo esperado

d. Comuna donde se presenta la falla:

6101: Rancagua

2. Descripción del equipamiento afectado

a. Sistema de Generación

Central	Unidad	Pérdida de Generación (MW)	H. Desconexión	H. Normalización
La Confluencia	1	000030.00	01:13	01:22

Total : **30 MW**

b. Sistema de Transmisión

Elemento Afectado	Tramo	Hora Desc.	Hora Norm.

c. Consumos

Sub-Estación	Pérdida de Consumo (MW)	% consumo pre-falla	Hora Desc.	Hora Norm.
S/E Colchagua	000001.73	000000.031	01:13	01:22
S/E Colchagua	000003.13	000000.056	01:13	01:22
S/E Colchagua	000001.95	000000.035	01:13	01:31
S/E Colchagua	000003.11	000000.056	01:13	01:38
S/E Rauquén	000003.81	000000.068	01:13	01:30
S/E Rauquén	000002.39	000000.043	01:13	01:24
S/E Rauquén	000002.83	000000.051	01:13	02:00
S/E Curicó	000001.83	000000.033	01:13	01:27
S/E Curicó	000002.30	000000.041	01:13	01:26
S/E Curicó	000004.60	000000.082	01:13	02:18
S/E Curicó	000002.00	000000.036	01:13	02:19
S/E San Vicente de Tagua Tagua	000005.32	000000.095	01:13	03:13
S/E San Vicente de Tagua Tagua	000007.54	000000.135	01:13	03:13
S/E Teno	000001.30	000000.023	01:13	01:21

Total : **43.84 MW** **0.785 %**

- Horas y montos señalados corresponden a lo informado por Transelec S.A., Transnet S.A., Cooperativa de Abastecimiento de Energía Eléctrica Curicó Ltda., Arauco Bioenergía S.A. e Hidroeléctrica La Higuera S.A.

3. Estimación de la energía no suministrada

Sub-Estación	Empresa	Tipo de Cliente	Pérdida de Consumo (MW)	Tiempo Desc. (Hr)	ENS (MWHr)
S/E Colchagua	CGE	Regulado	000001.73	00000.15	0000000000.3
S/E Colchagua	CGE	Regulado	000003.13	00000.15	0000000000.5
S/E Colchagua	CGE	Regulado	000001.95	00000.30	0000000000.6
S/E Colchagua	CGE	Regulado	000003.11	00000.42	0000000001.3
S/E Rauquén	CGE	Regulado	000003.81	00000.28	0000000001.1
S/E Rauquén	CGE	Regulado	000002.39	00000.18	0000000000.4
S/E Rauquén	CGE	Regulado	000002.83	00000.78	0000000002.2
S/E Curicó	CGE	Regulado	000001.83	00000.23	0000000000.4
S/E Curicó	CGE	Regulado	000002.30	00000.22	0000000000.5
S/E Curicó	COOP. ELECTRICA CURICO (CEC)	Regulado	000004.60	00001.08	0000000005.0
S/E Curicó	COOP. ELECTRICA CURICO (CEC)	Regulado	000002.00	00001.10	0000000002.2
S/E San Vicente de Tagua Tagua	CGE	Regulado	000005.32	00002.00	0000000010.6
S/E San Vicente de Tagua Tagua	AGROSUPER	Libre	000007.54	00002.00	0000000015.1
S/E Teno	ARAUCO BIOENERGIA	Libre	000001.30	00000.13	0000000000.2

Clientes Regulados : **25.1 MWHr**

Clientes Libres : **15.3 MWHr**

Total : **40.4 MWHr**

- Horas y montos señalados corresponden a lo informado por Transelec S.A., Transnet S.A., Cooperativa de Abastecimiento de Energía Eléctrica Curicó Ltda. y Arauco Bioenergía S.A.

4. Descripción de las configuraciones en los momentos previo y posterior a la falla

Demanda del sistema previo a la falla: 005584.57 MW

Regulación de Frecuencia

Unidad reguladora: Ralco U2

Operación Programada

En anexo Nº 1 se adjunta el detalle de la generación programada para el día 07 de Enero de 2016

Operación Real

En anexo Nº 2 se adjunta el detalle de la generación real del día 07 de Enero de 2016

Movimiento de centrales e informe de novedades relevantes del CDC

En anexo Nº 3 se presenta el detalle del movimiento de centrales e informe de novedades relevantes del CDC para el día 07 de Enero de 2016

Mantenimientos

En anexo Nº 4 se presenta el detalle de los mantenimientos programados y forzados para el día 07 de Enero de 2016

Estado y configuración previo a la falla

En los momentos previos a la desconexión forzada las instalaciones de transmisión se encontraban en servicio con la siguiente topología:

- Interruptores 52A3 y 52A4 de S/E Itahue de las líneas 154 kV Itahue - Tinguiririca Nº1 y Nº2 respectivamente abiertos por control de oscilaciones de potencia en el Sistema de 154 kV
- Transformador Nº2 154/66 kV de S/E Malloa alimentado de circuito 1 de la línea 154 kV Alto Jahuel - Rancagua - Tinguiririca, con el seccionador 52AS de S/E Malloa abierto
- S/E Teno 154 kV alimentada desde la línea 154 kV Itahue - Tinguiririca Nº1
- Línea 154 kV Alto Jahuel - Rancagua - Tinguiririca Nº2 fuera de servicio por falla desde las 01:08 horas, con S/E Punta de Cortés 154 kV y el transformador Nº1 154/66 kV de S/E Malloa fuera de servicio (evento asociado a EAF 004/2016)
- Línea 154 kV Itahue - Tinguiririca Nº2 fuera de servicio desde las 01:08 horas (evento asociado a EAF 004/2016)
- Central La Higuera Unidad Nº1 fuera de servicio a solicitud del CDC desde las 01:10 horas

Otros antecedentes relevantes

De acuerdo con lo informado por Transnet S.A.:

Según lo indicado en comunicaciones oficiales con el CDEC-SIC vía carta UER N°754/2015, Transnet cuenta con una propuesta de mejoras a la lógica de operación y muestreo del relé SEL451 del paño BT2 de SE San Vicente de Tagua - Tagua confeccionada por la empresa TECMA (desarrollador del presente esquema EDACxCEx), las cuales considera incorporación de ecuaciones que generan mayor seguridad ante la detección de componentes de secuencia negativa y directa, utilización del ángulo del fasor de secuencia positiva para el cálculo del ángulo entre otras.

Las pruebas efectivas de dichas mejoras en los laboratorios de TECMA, según lo indicado por la carta UER N°754/2015 y disponibilidad de la empresa TECMA está coordinada para la segunda semana de Febrero del 2016, donde participarán especialistas de Transnet para emitir una versión final del ajuste, lo cual será comunicado oportunamente a través de los medios habituales a la DO del CDEC-SIC. La implementación final de las mejoras se tiene planificada para el primer semestre del 2016 en los relés EDACxCEx de Transnet (situación detectada con ocasión del EAF 187/2015).

Acciones correctivas a largo plazo

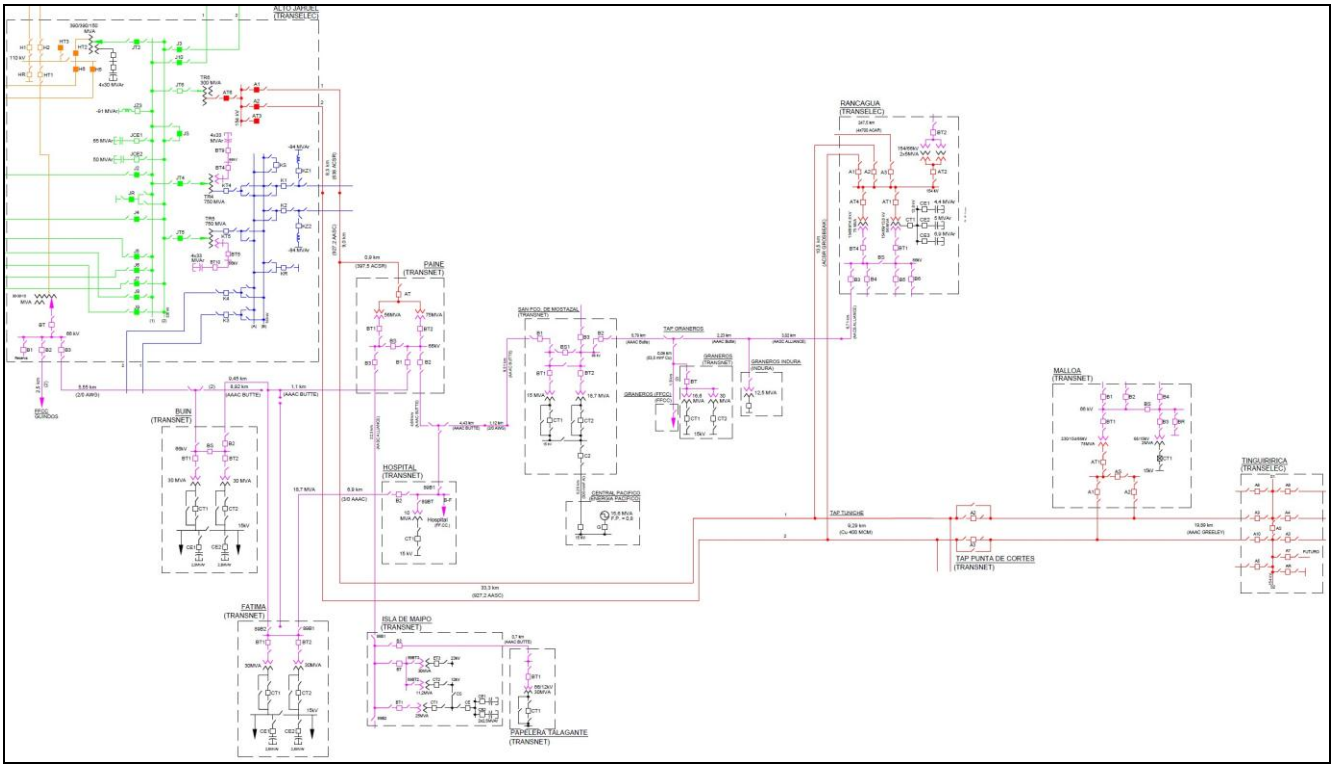
- Transelec S.A. señala que "No hay"
- Cooperativa de Abastecimiento de Energía Eléctrica Curicó Ltda. no se ha pronunciado al respecto
- Arauco Bioenergía S.A. señala que "No se necesitan ya que se concluye una correcta operación del esquema EDAC BF"
- Hidroeléctrica La Higuera S.A. indica "N/A"
- Transnet S.A. señala que "No aplica"

Acciones correctivas a corto plazo

- Transelec S.A. señala que "No hay"
- Cooperativa de Abastecimiento de Energía Eléctrica Curicó Ltda. no se ha pronunciado al respecto
- Arauco Bioenergía S.A. señala que "No se necesitan ya que se concluye una correcta operación del esquema EDAC BF"
- Hidroeléctrica La Higuera S.A. indica "N/A"
- Transnet S.A. señala que " El día 12 de enero a las 15:00 hrs se revisó visualmente el control SEL 351R del reconectador 52C0 alimentador Zapallar y los ajustes relacionados a la falla por EDAC 1 en SE Curicó, de lo cual visualmente no se encontró nada anormal, ya que el control se encontraba encendido y operativo con todos sus contactos correctamente conectados, por lo que se coordinó para el día miércoles 20 de enero la revisión del alambrado de control."

Usuario : TRANSNET / Solicitante : Rolando Rodríguez Mera						DPO	DCO	DOP
						Aprob	Aprob	Aprob
SD01189/2016	12/01/2016 17:06	> Subestacion: CURICO_____066 Otro Elemento de Subestacion : OTROS N ° : Intervención / Programada > Revisión de alambrado de control por no operación EDAC del interruptor 52C0 circuito Zapallar S/E Curico. **> Aprobada sin Activación CDC**	**20/01/2016 08:00**	**20/01/2016 18:00**		Aprob. CDC		

Diagrama simplificado de las instalaciones previo a la falla



5. Cronología de eventos y la descripción de las causas de los eventos

Hora	Evento
01:13:00	Maniobra de apertura apertura del 52A2 de S/E Punta de Cortés sin autorización del CDC. Centrales que inyectan en S/E Tinguiririca quedan generando en isla alimentando los consumos de SS/EE San Fernando y Teno 154 kV
01:13:00	Central La Confluencia U-1 sale del servicio en forma intempestiva
01:13:00	Central El Paso U-2 y U-3 salen del servicio en forma intempestiva (unidades en prueba)
01:13:00	Apertura del 52C3 (alimentador Enap) de S/E Colchagua por operación de EDAC BF, escalón 3
01:13:00	Apertura del 52C5 (alimentador Sarmiento) de S/E Rauquén por operación de EDAC BF, escalón 3
01:13:00	Apertura del 52C5 (alimentador Maggi) de S/E Colchagua por operación de EDAC BF, escalón 3
01:13:00	Apertura del 52C2 (alimentador Los Vidales) de S/E Rauquén por operación de EDAC BF, escalón 3
01:13:00	Apertura del 52C2 (alimentador Tinguiririca) de S/E Colchagua por operación de EDAC BF, escalón 5
01:13:00	Apertura del 52C1 (alimentador Miraflores) de S/E Colchagua por operación de EDAC BF, escalón 6
01:13:00	Apertura del 52C3 (alimentador Rucatremo) de S/E Curicó por operación de EDAC BF, escalón 4
01:13:00	Apertura del 52C4 (alimentador Quilvo) de S/E Rauquén por operación de EDAC BF, escalón 2
01:13:00	Apertura del 52C5 (alimentador Aguas Negras) de S/E Curicó por operación de EDAC BF, escalón 1
01:13:00	Deslastre de cargas en S/E Teno MDP por operación de EDAC BF, escalón 1
01:13:00	Apertura del 52BT2 (transformador Nº2) de S/E San Vicente de Tagua Tagua por operación de EDAC CEx
01:13:00	Apertura del 52C7 (alimentador Los Niches) de S/E Curicó por operación de EDAC BF, escalón 4
01:13:00	Apertura del 52C6 (alimentador La Obra) de S/E Curicó por operación de EDAC BF, escalón 2

6. Normalización del servicio

Fecha	Hora	Acción
07-01-2016	01:17:00	Se realiza cierre del 52A3 de S/E Itahue de la línea 154 kV Itahue - Tinguiririca Nº1, sincronizando SS/EE San Fernando, Teno y Malloa al SIC
07-01-2016	01:21:00	Se normalizan cargas deslastradas en S/E Teno MDP
07-01-2016	01:22:00	Central La Confluencia U-1 sincroniza al sistema
07-01-2016	01:22:00	Se realiza cierre del 52C3 (alimentador Enap) de S/E Colchagua
07-01-2016	01:22:00	Se realiza cierre del 52C5 (alimentador Maggi) de S/E Colchagua
07-01-2016	01:24:00	Se realiza cierre del 52C2 (alimentador Los Vidales) de S/E Rauquén
07-01-2016	01:26:00	Se realiza cierre del 52C3 (alimentador Rucatremo) de S/E Curicó
07-01-2016	01:27:00	Se realiza cierre del 52C5 (alimentador Aguas Negras) de S/E Curicó
07-01-2016	01:30:00	Se realiza cierre del 52C4 (alimentador Quilvo) de S/E Rauquén
07-01-2016	01:31:00	Se realiza cierre del 52C2 (alimentador Tinguiririca) de S/E Colchagua
07-01-2016	01:38:00	Se realiza cierre del 52C1 (alimentador Miraflores) de S/E Colchagua
07-01-2016	02:00:00	Se realiza cierre del 52C5 (alimentador Sarmiento) de S/E Rauquén
07-01-2016	02:18:00	Se realiza cierre del 52C6 (alimentador La Obra) de S/E Curicó
07-01-2016	02:19:00	Se realiza cierre del 52C7 (alimentador Los Niches) de S/E Curicó
07-01-2016	03:13:00	Se realiza cierre del 52BT2 (transformador Nº2) de S/E San Vicente de Tagua Tagua
07-01-2016	10:39:00	Se realiza cierre del 52A2 de S/E Punta de Cortés
08-01-2016	01:54:00	Se realiza cierre del 52A3 de S/E Punta de Cortés

- Horas, maniobras y eventos señalados corresponden a lo informado por Transelec S.A., Transnet S.A., Cooperativa de Abastecimiento de Energía Eléctrica Curicó Ltda., Arauco Bioenergía S.A., Hidroeléctrica La Higuera S.A. y a lo consignado en el Informe de Novedades Relevantes del CDC

7. Análisis de las causas de la falla y de la actuación de los dispositivos de protección y control

Maniobra manual de apertura del 52A2 y 52A3 de S/E P. de Cortés no autorizada por el CDC, que provoca que centrales que inyectan en S/E Tinguiririca quedan generando en isla alimentando los consumos de SS/EE San Fernando y Teno 154 kV, con posterior salida de servicio de centrales y operación EDAC

De acuerdo con lo consignado en el Informe de Novedades del CDC, alrededor de las 01:13 horas del día 07-01-2016, en "S/E Punta de Cortés CC de Transelec abre interruptores de línea de 154 kV Tinguiririca – Rancagua – Alto Jahuel 1 y 2, no autorizado por el CDC", lo que sumado a la falla ocurrida en la línea 154 kV Alto Jahuel - Rancagua - Tinguiririca Nº2 a las 01:08 horas y la topología de las líneas 154 kV Itahue - Tinguiririca Nº1 y Nº2, provoca que las SS/EE Teno 154 kV y San Fernando 154 kV queden operando en isla eléctrica alimentadas desde las centrales La Higuera, La Confluencia, San Andrés y El Paso (central en pruebas).

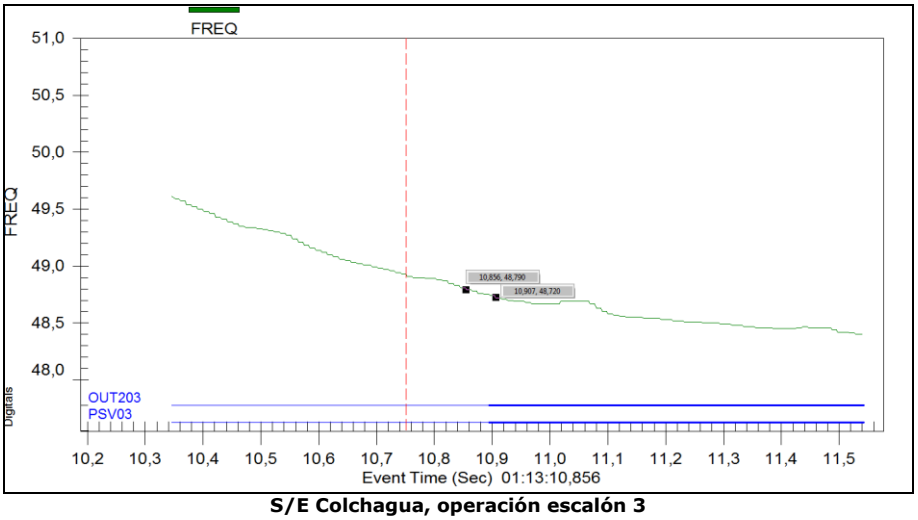
Debido a la inestabilidad con queda operando la mencionada isla eléctrica, se produce la salida de servicio de las unidades Nº2 y Nº3 de central El Paso (central en pruebas de puesta en servicio) y de la unidad Nº1 de central La Confluencia.

Respecto de la salida de servicio de central La Confluencia, su propietario ha informado que ésta se produjo por la operación del EDAG en S/E Tinguiririca, indicando que a "*las 01:07 horas comienza a producirse un fuerte desequilibrio de cargas, y oscilación en la frecuencia. Se intentó bajar carga de las unidades generadoras en virtud de la frecuencia, sin embargo tomó el control de las unidades el sistema EDAG*":

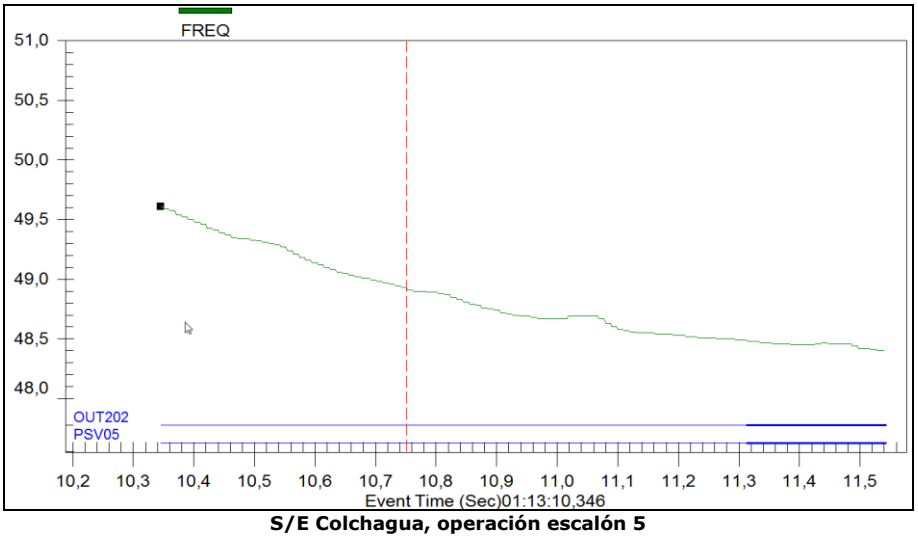
- 01:07 horas: fuertes variaciones de cargas y frecuencia.
- 01:08 horas: tomó control de las unidades el EDAG cual mandó a bajar las cargas de las unidades, sin embargo no fue suficiente.
- 01:13 horas: EDAG provoca la apertura del interruptor, quedando la unidad en vacío, pero a velocidad nominal y lista para conectar. Se esperó a que el fenómeno de oscilación de frecuencia y el desequilibrio de cargas se controlara.
- 01:22 horas: se vuelve a sincronizar unidad, subiendo carga en forma lenta, en observancia del comportamiento de la frecuencia.

Dado que para los eventos anteriores, el propietario de central La Confluencia no ha aportado registros de la operación del EDAG en S/E Tinguiririca, no es posible analizar si éste operó o no adecuadamente.

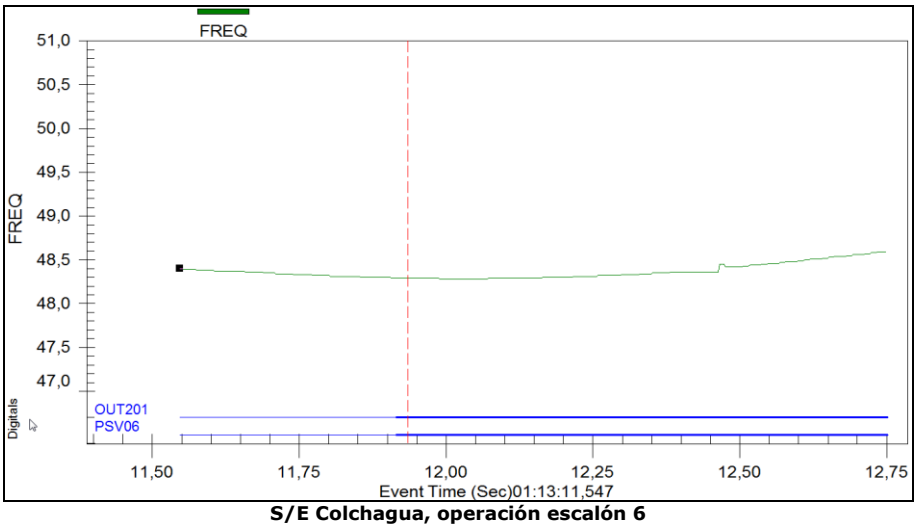
Tras la salida de servicio de las centrales previamente mencionadas, se produce una caída en la frecuencia de la isla eléctrica, lo que provoca la operación de diversos escalones del EDAC BF en las correspondientes instalaciones, presentándose a continuación sus registros.



S/E Colchagua, operación escalón 3



S/E Colchagua, operación escalón 5



S/E Colchagua, operación escalón 6

RELE DE FRECUENCIA Date: 12/01/2016 Time: 17:02:45.326
SE COLCHAGUA Serial Number: 2006076077

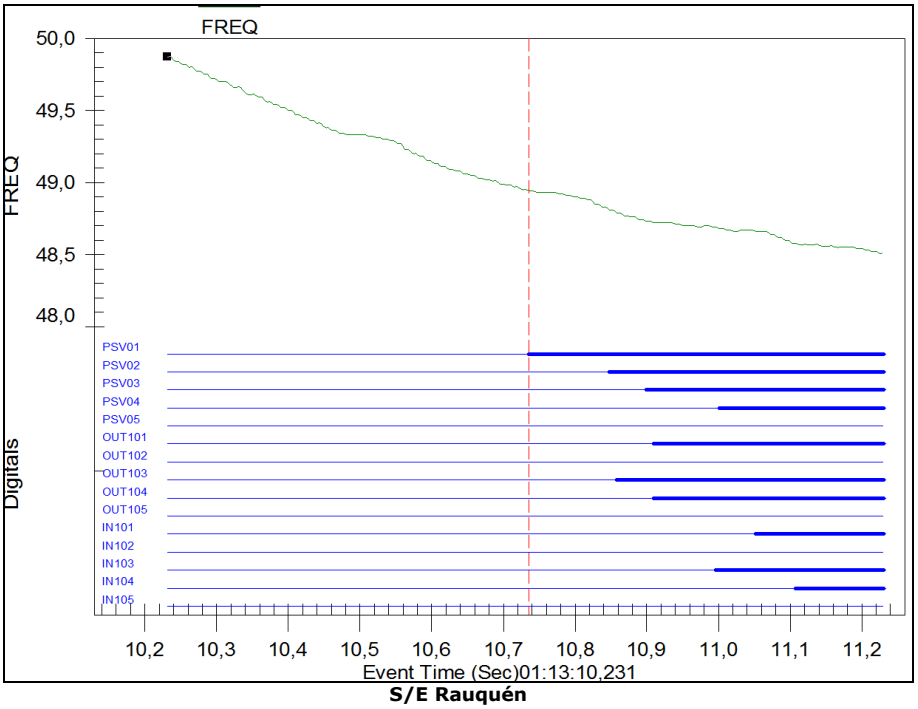
FID=SEL-451-1-R200-V0-Z004004-D20060814

#	DATE	TIME	ELEMENT	STATE
147	06/01/2016	08:00:00.003	OP-00-08HR	Deasserted
146	07/01/2016	00:00:00.003	OP-00-08HR	Asserted
145	07/01/2016	01:13:10.693	EDAC1	Asserted
144	07/01/2016	01:13:10.733	EDAC1T	Asserted
143	07/01/2016	01:13:10.751	ER	Asserted
142	07/01/2016	01:13:10.751	ASV012	Asserted
141	07/01/2016	01:13:10.751	ASV014	Asserted
140	07/01/2016	01:13:10.756	ER	Deasserted
139	07/01/2016	01:13:10.756	ASV012	Deasserted
138	07/01/2016	01:13:10.756	ASV014	Deasserted
137	07/01/2016	01:13:10.774	EDAC2	Asserted
136	07/01/2016	01:13:10.815	EDAC2T	Asserted
135	07/01/2016	01:13:10.830	ER	Asserted
134	07/01/2016	01:13:10.830	ASV012	Asserted
133	07/01/2016	01:13:10.830	ASV014	Asserted
132	07/01/2016	01:13:10.835	ER	Deasserted
131	07/01/2016	01:13:10.835	ASV012	Deasserted
130	07/01/2016	01:13:10.835	ASV014	Deasserted
129	07/01/2016	01:13:10.856	EDAC3	Asserted
128	07/01/2016	01:13:10.897	EDAC3T	Asserted
127	07/01/2016	01:13:10.897	OUT106	Asserted
126	07/01/2016	01:13:10.897	OUT203	Asserted
125	07/01/2016	01:13:10.897	OUT205	Asserted
124	07/01/2016	01:13:10.915	ER	Asserted

123	07/01/2016	01:13:10.915	ASV011	Asserted
122	07/01/2016	01:13:10.915	ASV014	Asserted
121	07/01/2016	01:13:10.920	ER	Deasserted
120	07/01/2016	01:13:10.920	ASV011	Deasserted
119	07/01/2016	01:13:10.920	ASV014	Deasserted
118	07/01/2016	01:13:10.938	EDAC4	Asserted
117	07/01/2016	01:13:10.979	EDAC4T	Asserted
116	07/01/2016	01:13:10.992	ER	Asserted
115	07/01/2016	01:13:10.992	ASV012	Asserted
114	07/01/2016	01:13:10.992	ASV014	Asserted
113	07/01/2016	01:13:10.999	ER	Deasserted
112	07/01/2016	01:13:10.999	ASV012	Deasserted
111	07/01/2016	01:13:10.999	ASV014	Deasserted
110	07/01/2016	01:13:11.004	IN203	Asserted
109	07/01/2016	01:13:11.007	IN205	Asserted
108	07/01/2016	01:13:11.017	52C3.ENAP	Deasserted
107	07/01/2016	01:13:11.017	52C5.MAGGI	Deasserted
106	07/01/2016	01:13:11.017	ASV013	Deasserted
105	07/01/2016	01:13:11.025	FREQ<49.0_DFDT=<0.6	Asserted
104	07/01/2016	01:13:11.025	FREQ<48.8_DFDT=<0.6	Asserted
103	07/01/2016	01:13:11.025	EDAC1	Deasserted
102	07/01/2016	01:13:11.025	EDAC3	Deasserted
101	07/01/2016	01:13:11.040	ASV012	Asserted
100	07/01/2016	01:13:11.048	ASV012	Deasserted
99	07/01/2016	01:13:11.123	EDAC1	Asserted
98	07/01/2016	01:13:11.123	EDAC3	Asserted
97	07/01/2016	01:13:11.123	FREQ<49.0_DFDT=<0.6	Deasserted
96	07/01/2016	01:13:11.123	FREQ<48.8_DFDT=<0.6	Deasserted
95	07/01/2016	01:13:11.246	FREQ<49.0_DFDT=<0.6	Asserted
94	07/01/2016	01:13:11.246	FREQ<48.8_DFDT=<0.6	Asserted
93	07/01/2016	01:13:11.246	EDAC1	Deasserted
92	07/01/2016	01:13:11.246	EDAC3	Deasserted
91	07/01/2016	01:13:11.261	ASV012	Asserted
90	07/01/2016	01:13:11.269	ASV012	Deasserted
89	07/01/2016	01:13:11.277	EDAC5	Asserted
88	07/01/2016	01:13:11.318	EDAC5T	Asserted
87	07/01/2016	01:13:11.318	OUT202	Asserted
86	07/01/2016	01:13:11.336	ER	Asserted
85	07/01/2016	01:13:11.336	ASV011	Asserted
84	07/01/2016	01:13:11.336	ASV014	Asserted
83	07/01/2016	01:13:11.341	ER	Deasserted
82	07/01/2016	01:13:11.341	ASV011	Deasserted
81	07/01/2016	01:13:11.341	ASV014	Deasserted
80	07/01/2016	01:13:11.473	IN202	Asserted
79	07/01/2016	01:13:11.486	52C2.TINGUIRIRICA	Deasserted
78	07/01/2016	01:13:11.622	EDAC1	Asserted
77	07/01/2016	01:13:11.622	EDAC3	Asserted
76	07/01/2016	01:13:11.622	FREQ<49.0_DFDT=<0.6	Deasserted
75	07/01/2016	01:13:11.622	FREQ<48.8_DFDT=<0.6	Deasserted
74	07/01/2016	01:13:11.664	FREQ<49.0_DFDT=<0.6	Asserted
73	07/01/2016	01:13:11.664	FREQ<48.8_DFDT=<0.6	Asserted
72	07/01/2016	01:13:11.664	EDAC1	Deasserted
71	07/01/2016	01:13:11.664	EDAC3	Deasserted
70	07/01/2016	01:13:11.677	ASV012	Asserted
69	07/01/2016	01:13:11.682	ASV012	Deasserted
68	07/01/2016	01:13:11.876	EDAC6	Asserted
67	07/01/2016	01:13:11.917	EDAC6T	Asserted
66	07/01/2016	01:13:11.917	OUT201	Asserted
65	07/01/2016	01:13:11.935	ER	Asserted
64	07/01/2016	01:13:11.935	ASV011	Asserted
63	07/01/2016	01:13:11.935	ASV014	Asserted
62	07/01/2016	01:13:11.940	ER	Deasserted
61	07/01/2016	01:13:11.940	ASV011	Deasserted
60	07/01/2016	01:13:11.940	ASV014	Deasserted
59	07/01/2016	01:13:12.197	EDAC6	Deasserted
58	07/01/2016	01:13:12.461	IN201	Asserted
57	07/01/2016	01:13:12.471	52C1.MIRAFLORES	DEASSERTED
56	07/01/2016	01:13:12.621	EDAC5	Deasserted
55	07/01/2016	01:13:12.698	EDAC1T	Deasserted
54	07/01/2016	01:13:12.698	EDAC3T	Deasserted
53	07/01/2016	01:13:12.698	OUT203	Deasserted
52	07/01/2016	01:13:12.698	OUT205	Deasserted
51	07/01/2016	01:13:12.909	EDAC4	Deasserted

50	07/01/2016	01:13:13.094	FREQ<48.8_DFDT=<0.6	Deasserted
49	07/01/2016	01:13:13.227	EDAC6T	Deasserted
48	07/01/2016	01:13:13.227	OUT201	Deasserted
47	07/01/2016	01:13:13.406	EDAC2	Deasserted
46	07/01/2016	01:13:13.646	EDAC5T	Deasserted
45	07/01/2016	01:13:13.646	OUT106	Deasserted
44	07/01/2016	01:13:13.646	OUT202	Deasserted
43	07/01/2016	01:13:13.933	EDAC4T	Deasserted
42	07/01/2016	01:13:14.428	EDAC2T	Deasserted
41	07/01/2016	01:13:14.484	EDAC2	Asserted
40	07/01/2016	01:13:14.525	EDAC2T	Asserted
39	07/01/2016	01:13:14.541	ASV012	Asserted
38	07/01/2016	01:13:14.548	ASV012	Deasserted
37	07/01/2016	01:13:14.965	FREQ<48.8_DFDT=<0.6	Asserted
36	07/01/2016	01:13:14.981	ASV012	Asserted
35	07/01/2016	01:13:14.988	ASV012	Deasserted
34	07/01/2016	01:13:15.970	FREQ<48.8_DFDT=<0.6	Deasserted
33	07/01/2016	01:13:16.420	EDAC2	Deasserted
32	07/01/2016	01:13:16.793	FREQ<49.0_DFDT=<0.6	Deasserted
31	07/01/2016	01:13:17.441	EDAC2T	Deasserted
30	07/01/2016	01:22:24.130	IN203	Deasserted
29	07/01/2016	01:22:24.142	52C3.ENAP	Asserted
28	07/01/2016	01:22:29.616	IN205	Deasserted
27	07/01/2016	01:22:29.626	52C5.MAGGI	Asserted
26	07/01/2016	01:30:45.905	IN202	Deasserted
25	07/01/2016	01:30:45.913	52C2.TINGUIRIRICA	Asserted
24	07/01/2016	01:37:52.668	IN201	Deasserted
23	07/01/2016	01:37:52.678	52C1.MIRAFLORES	Asserted
22	07/01/2016	01:37:52.678	ASV013	Asserted
21	07/01/2016	08:00:00.002	OP-00-08HR	Deasserted

Registro SER Colchagua



S/E Rauquén

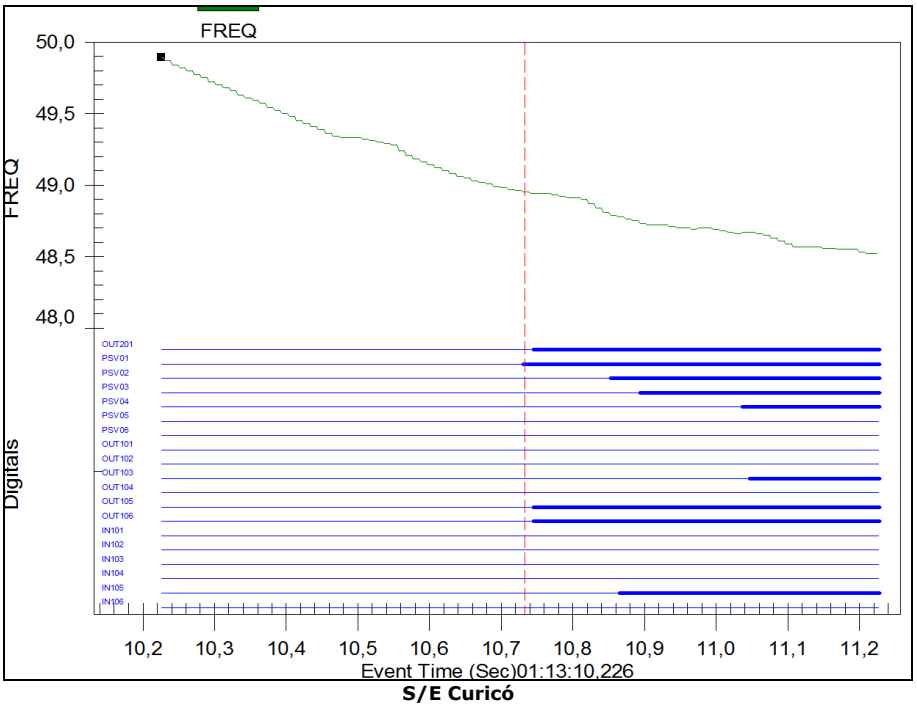
RELE DE FRECUENCIA Date: 11/01/2016 Time: 12:06:25.691
S/E RAUQUEN Serial Number: 2006076075

FID=SEL-451-1-R200-V0-Z004004-D20060814

#	DATE	TIME	ELEMENT	STATE
34	21/12/2015	13:31:13.375	Los Vidales ex Rauqu 52C2	cerrado
33	07/01/2016	01:13:10.733	EDAC1	Asserted
32	07/01/2016	01:13:10.845	EDAC2	Asserted
31	07/01/2016	01:13:10.858	QUILVO	Asserted
30	07/01/2016	01:13:10.858	Quilvo	Trip EDAC 2
29	07/01/2016	01:13:10.896	EDAC3	Asserted
28	07/01/2016	01:13:10.909	CTO_RAUQUEN	Asserted
27	07/01/2016	01:13:10.909	SARMIENTO	Asserted
26	07/01/2016	01:13:10.909	Los Vidales ex Rauq	Trip EDAC 3
25	07/01/2016	01:13:10.909	Sarmiento	Trip EDAC 3

24	07/01/2016	01:13:10.996	Cto Quilvo	52C4 abierto
23	07/01/2016	01:13:10.999	EDAC4	Asserted
22	07/01/2016	01:13:11.050	Los Vidales ex Rauqu 52C2 abierto	
21	07/01/2016	01:13:11.109	Cto Sarmiento	52C5 abierto
20	07/01/2016	01:13:11.307	EDAC5	Asserted
19	07/01/2016	01:13:11.917	EDAC6	Asserted
18	07/01/2016	01:13:12.321	EDAC1	Deasserted
17	07/01/2016	01:13:12.321	EDAC3	Deasserted
16	07/01/2016	01:13:12.333	Los Vidales ex Rauq	Reset Trip EDAC 3
15	07/01/2016	01:13:12.333	Sarmiento	Reset Trip EDAC 3
14	07/01/2016	01:13:13.227	EDAC6	Deasserted
13	07/01/2016	01:13:13.636	EDAC5	Deasserted
12	07/01/2016	01:13:13.932	EDAC4	Deasserted
11	07/01/2016	01:13:14.433	EDAC2	Deasserted
10	07/01/2016	01:13:14.446	Quilvo	Reset Trip EDAC 2
9	07/01/2016	01:13:14.525	EDAC2	Asserted
8	07/01/2016	01:13:14.540	Quilvo	Trip EDAC 2
7	07/01/2016	01:13:17.440	EDAC2	Deasserted
6	07/01/2016	01:13:17.456	Quilvo	Reset Trip EDAC 2
5	07/01/2016	01:23:51.000	Los Vidales ex Rauqu 52C2 cerrado	
4	07/01/2016	01:30:11.811	Cto Quilvo	52C4 Cerrado
3	07/01/2016	01:59:46.651	Cto Sarmiento	52C5 Cerrado
2	08/01/2016	08:53:44.114	Los Vidales ex Rauqu 52C2 abierto	
1	08/01/2016	08:53:44.149	Los Vidales ex Rauqu 52C2 cerrado	

Registro SER S/E Rauquén



S/E Curicó

RELE DE FRECUENCIA Date: 11/01/2016 Time: 12:42:44.996
S/E CURICO Serial Number: 2006076073

FID=SEL-451-1-R200-V0-Z004004-D20060814

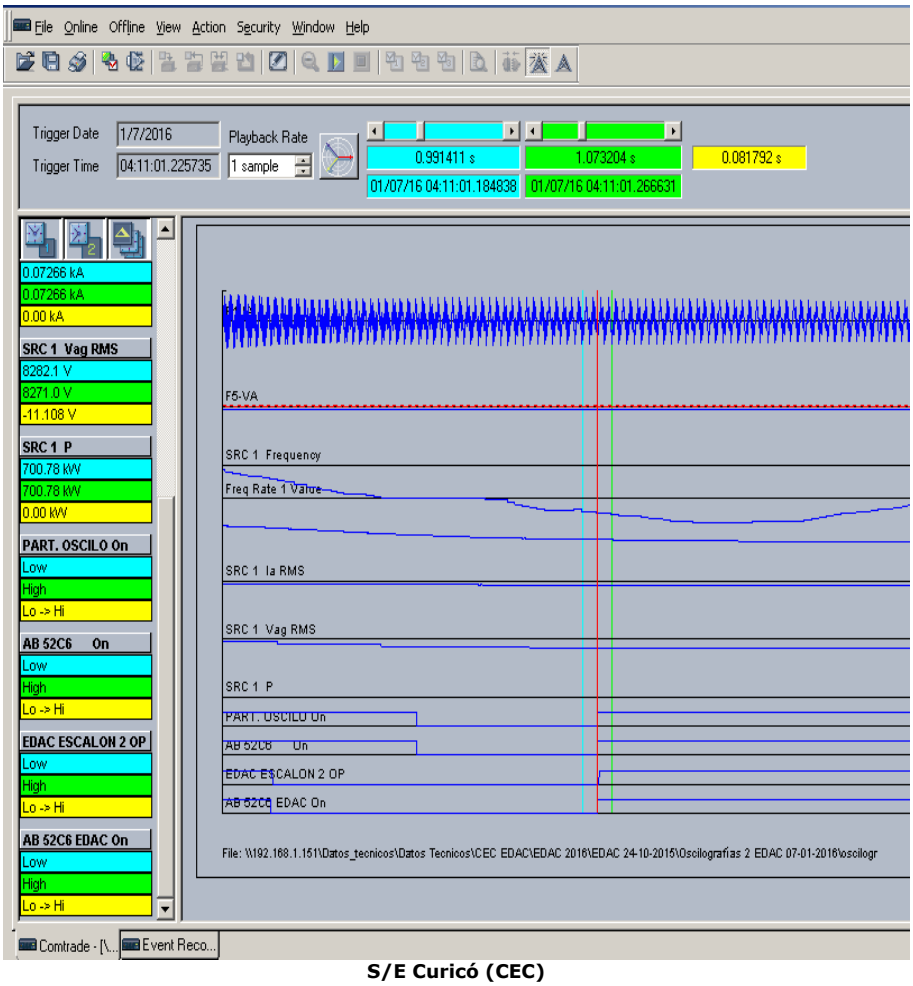
#	DATE	TIME	ELEMENT	STATE
28	16/12/2015	13:13:35.995	BOMBERO GARRIDO	52C4 CERRADO
27	07/01/2016	01:13:10.731	EDAC1	Asserted
26	07/01/2016	01:13:10.746	C5_AGUAS_NEGRAS	Asserted
25	07/01/2016	01:13:10.746	C0_ZAPALLAR	Asserted
24	07/01/2016	01:13:10.746	AGUAS NEGRAS C5	Trip EDAC 1
23	07/01/2016	01:13:10.746	ZAPALLAR C0	TRip EDAC 1
22	07/01/2016	01:13:10.853	EDAC2	Asserted
21	07/01/2016	01:13:10.866	AGUAS NEGRAS	52C5 ABIERTO
20	07/01/2016	01:13:10.894	EDAC3	Asserted
19	07/01/2016	01:13:11.038	EDAC4	Asserted
18	07/01/2016	01:13:11.048	C3_RUCATREMO	Asserted
17	07/01/2016	01:13:11.048	RUCATREMO C3	TRIP EDAC4
16	07/01/2016	01:13:11.295	RUCATREMO	52C3 ABIERTO
15	07/01/2016	01:13:11.315	EDAC5	Asserted
14	07/01/2016	01:13:11.914	EDAC6	Asserted
13	07/01/2016	01:13:12.401	EDAC1	Deasserted
12	07/01/2016	01:13:12.401	EDAC3	Deasserted
11	07/01/2016	01:13:12.414	AGUAS NEGRAS C5	Reset Trip EDAC 1

10	07/01/2016	01:13:12.414	ZAPALLAR C0	Reset Trip EDAC 1
9	07/01/2016	01:13:13.224	EDAC6	Deasserted
8	07/01/2016	01:13:13.633	EDAC5	Deasserted
7	07/01/2016	01:13:13.930	EDAC4	Deasserted
6	07/01/2016	01:13:13.942	RUCATREMO C3	REset Trip EDAC 4
5	07/01/2016	01:13:14.430	EDAC2	Deasserted
4	07/01/2016	01:13:14.512	EDAC2	Asserted
3	07/01/2016	01:13:17.438	EDAC2	Deasserted
2	07/01/2016	01:25:29.763	RUCATREMO	52C3 CERRADO
1	07/01/2016	01:27:13.571	AGUAS NEGRAS	52C5 CERRADO

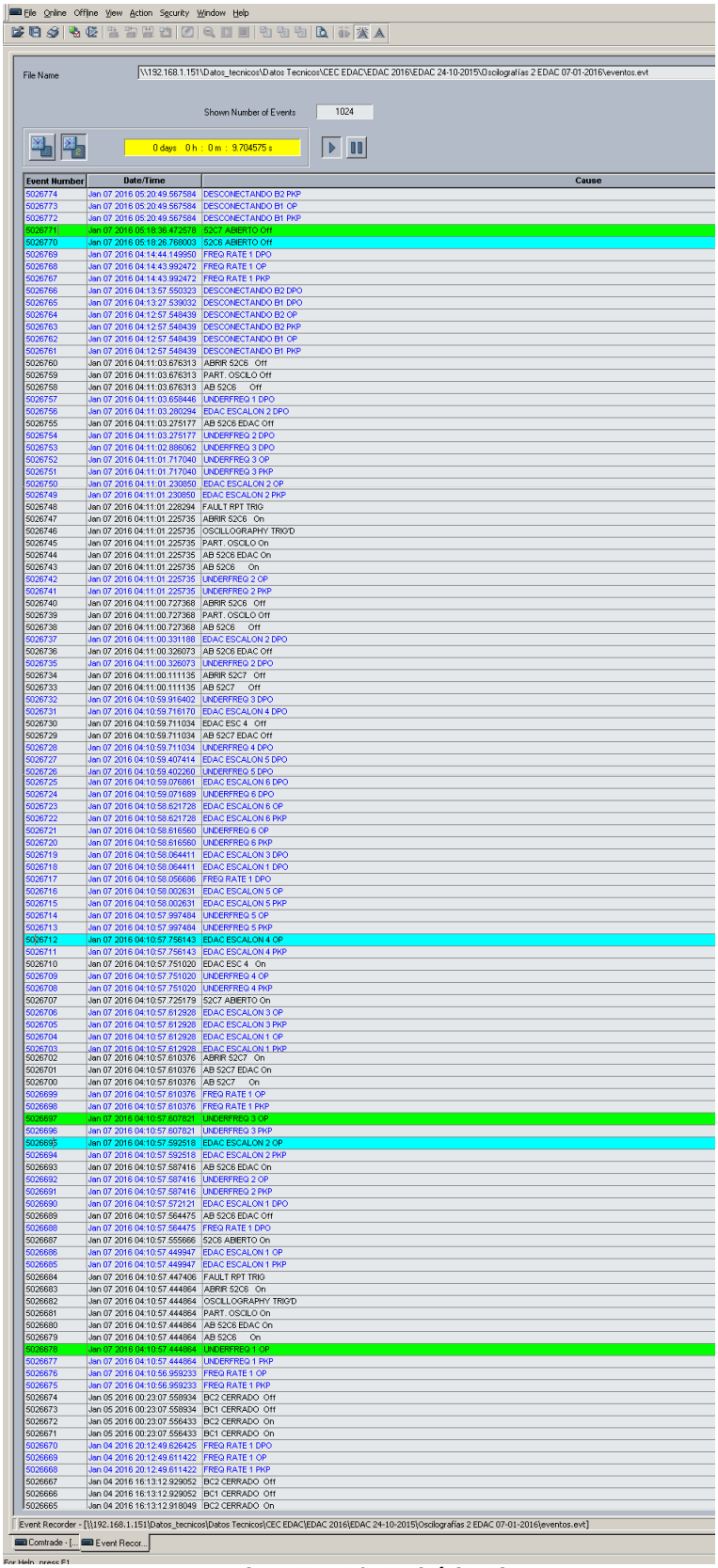
Registro SER S/E Curicó

En los registros previos (oscilografías y registros SER) asociados a la SS/EE indicadas, se aprecia que la frecuencia bajó respecto de los valores de los escalones operados del EDAC BF (y con un gradiente más rápido que -0.6Hz/s al bajar de 49.0 Hz y 48.8), operando los respectivos escalones del EDAC BF justificadamente en estas instalaciones, produciéndose en ellas la apertura de los respectivos interruptores de los alimentadores MT, salvo para el caso del 52C0 (alimentador Zapallar) de S/E Curicó.

En el caso del 52C0 (alimentador Zapallar) de S/E Curicó, en los respectivos registros se observa la orden de TRIP a la protección del alimentador 52C0 Zapallar, sin que se produzca la apertura del interruptor, lo que se encuentra en investigación por parte de Transnet S.A.



S/E Curicó (CEC)

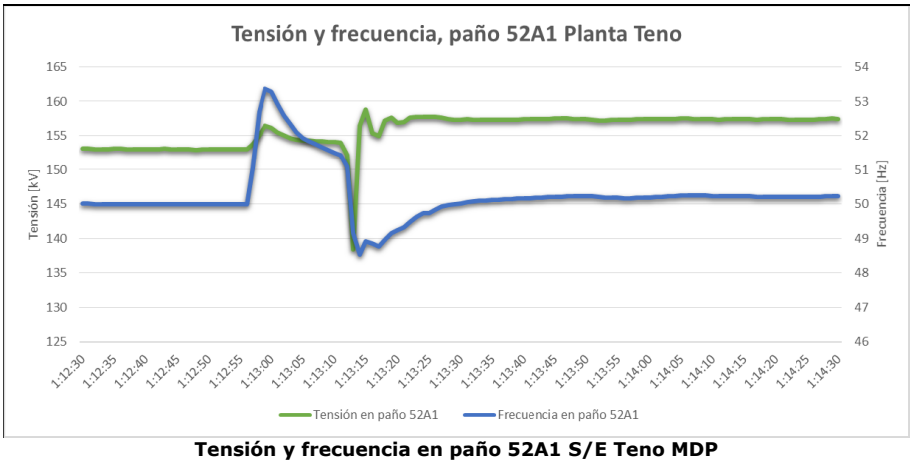


Registro SER S/E Curicó (CEC)

A partir de los registros previos se aprecia que se dieron las condiciones de operación para el escalón Nº2 del alimentador 52C6 La Obra Zapallar y para el escalón Nº4 del alimentador 52C7 Los Niches de S/E Curicó.

Event Number	Date/Time	
1625407	Jan 07 2016 01:13:10.720339	C+MC04 ABTO On
1625406	Jan 07 2016 01:13:10.718836	5400MC01 ABT On
1625405	Jan 07 2016 01:13:10.718337	MCC03 WY CER Off
1625404	Jan 07 2016 01:13:10.717836	IMEAS CERRAD On
1625403	Jan 07 2016 01:13:10.717836	IMEAS ABTO On
1625402	Jan 07 2016 01:13:10.717836	5400MC01 CER On
1625401	Jan 07 2016 01:13:10.717335	Q+MC04 ABTO On
1625400	Jan 07 2016 01:13:10.713334	5400MC01 CER Off
1625399	Jan 07 2016 01:13:10.711334	IMEAS CERRAD Off
1625398	Jan 07 2016 01:13:10.634146	EDAC OPERADO On
1625397	Jan 07 2016 01:13:10.634146	TR MCC03 WY On
1625396	Jan 07 2016 01:13:10.634146	TR MCC02 WY On
1625395	Jan 07 2016 01:13:10.634146	TR MMCCPLC01 On
1625394	Jan 07 2016 01:13:10.634146	TR C+MC03 On
1625393	Jan 07 2016 01:13:10.634146	TR C+MC04 On
1625392	Jan 07 2016 01:13:10.634146	TR IMEAS On
1625391	Jan 07 2016 01:13:10.634146	TR 5400MC01 On
1625390	Jan 07 2016 01:13:10.634146	TR Q+MC04 On
1625389	Jan 07 2016 01:13:10.634146	TR Q+MC06 On
1625388	Jan 07 2016 01:13:10.634146	EDAC OPERADO On
1625387	Jan 07 2016 01:13:10.634146	ESC 1 OPERAD On
1625386	Jan 07 2016 01:13:10.634146	UNDERFREQ 1 OP
1625385	Jan 07 2016 01:13:10.634146	UNDERFREQ 1 PKP
1625384	Jan 07 2016 01:13:09.728799	FREQ RATE 1 OP
1625383	Jan 07 2016 01:13:09.728799	FREQ RATE 1 PKP
1625382	Jan 07 2016 01:07:26.724592	FREQ RATE 1 DPO
1625381	Jan 07 2016 01:07:26.649735	FREQ RATE 1 PKP
1625380	Jan 07 2016 01:07:26.345305	FREQ RATE 1 DPO
1625379	Jan 07 2016 01:07:26.252853	FREQ RATE 1 OP
1625378	Jan 07 2016 01:07:26.252853	FREQ RATE 1 PKP
1625377	Dec 29 2015 11:46:09.999443	FREQ RATE 1 DPO
1625376	Dec 29 2015 11:46:09.964429	FREQ RATE 1 OP
1625375	Dec 29 2015 11:46:09.964429	FREQ RATE 1 PKP
1625374	Dec 18 2015 08:00:48.507876	FREQ RATE 1 DPO
1625373	Dec 18 2015 08:00:48.475395	FREQ RATE 1 OP
1625372	Dec 18 2015 08:00:48.475395	FREQ RATE 1 PKP
1625371	Dec 18 2015 08:00:43.619715	FREQ RATE 1 DPO
1625370	Dec 18 2015 08:00:43.684800	FREQ RATE 1 PKP
1625369	Dec 18 2015 08:00:43.677895	FREQ RATE 1 DPO
1625368	Dec 18 2015 08:00:43.645430	FREQ RATE 1 OP
1625367	Dec 18 2015 08:00:43.645430	FREQ RATE 1 PKP
1625366	Dec 07 2015 11:25:43.153372	FREQ RATE 1 DPO
1625365	Dec 07 2015 11:25:43.098262	FREQ RATE 1 OP

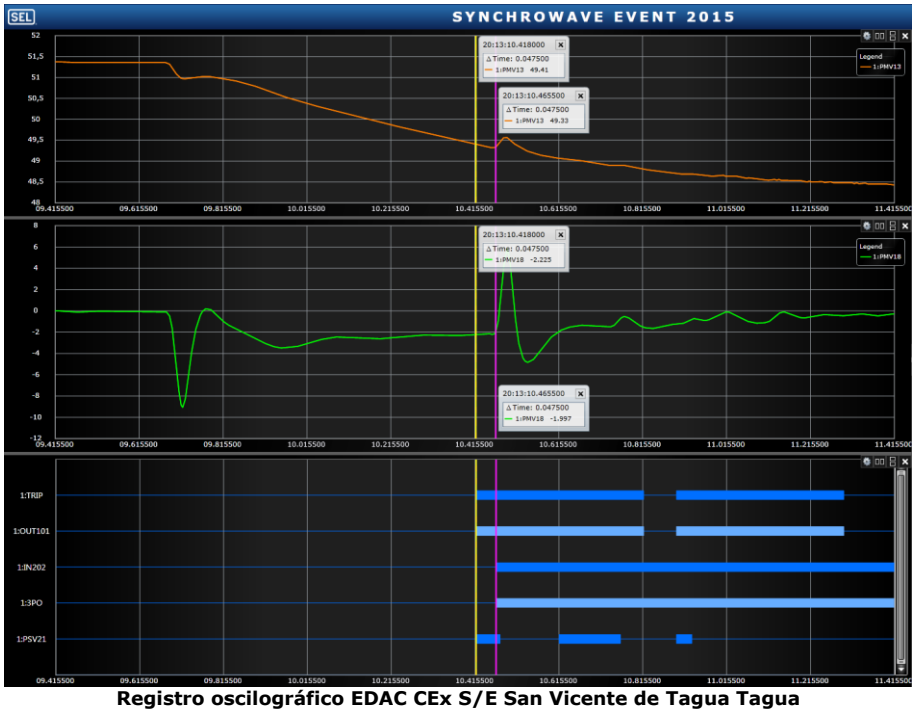
Registro SER S/E Teno MDP



Tensión y frecuencia en paño 52A1 S/E Teno MDP

A partir de los registros previos se aprecia que se dieron las condiciones de operación para el escalón Nº1 de S/E Teno MDP, que da orden de deslastre de carga a los alimentadores 52CB4, 52CB5, 52CB6, 52CB7, 52CB8, 52CB9, 52CB10, 52CB11 y 52CB12 de dicha instalación.

Además de la operación de los escalones del EDAC BF en las SS/EE previamente indicadas, se produce además la apertura del 52BT2 de S/E San Vicente de Tagua Tagua por operación del EDAC CEx, cuyos registros se presentan a continuación.



Registro oscilográfico EDAC CEx S/E San Vicente de Tagua Tagua

EDACxCEx Date: 01/13/2016 Time: 10:25:10.345
SE SVTT Serial Number: 1132530086
FID=SEL-451-5-R314-V0-Z019012-D20130618

#	DATE	TIME	ELEMENT	STATE
66	01/06/2016	20:07:26.6739	OUT105	ASSERTED
65	01/06/2016	20:07:26.6789	OUT105	DEASSERTED
64	01/06/2016	20:07:26.7214	OUT105	ASSERTED
63	01/06/2016	20:13:09.9188	PCT01Q	ASSERTED
62	01/06/2016	20:13:09.9288	PCT02Q	ASSERTED
61	01/06/2016	20:13:09.9614	PCT03Q	ASSERTED
60	01/06/2016	20:13:10.4188	PSV21	ASSERTED
59	01/06/2016	20:13:10.4188	PSV22	ASSERTED
58	01/06/2016	20:13:10.4188	PSV23	ASSERTED
57	01/06/2016	20:13:10.4188	PCT11Q	ASSERTED
56	01/06/2016	20:13:10.4188	OUT101	ASSERTED
55	01/06/2016	20:13:10.4188	OUT104	ASSERTED
54	01/06/2016	20:13:10.4188	OUT106	ASSERTED
53	01/06/2016	20:13:10.4438	IN201	DEASSERTED
52	01/06/2016	20:13:10.4663	IN202	ASSERTED
51	01/06/2016	20:13:10.4714	PSV23	DEASSERTED
50	01/06/2016	20:13:10.4714	PCT03Q	DEASSERTED
49	01/06/2016	20:13:10.4764	PSV21	DEASSERTED
48	01/06/2016	20:13:10.4764	PSV22	DEASSERTED
47	01/06/2016	20:13:10.4764	PCT01Q	DEASSERTED
46	01/06/2016	20:13:10.4764	PCT02Q	DEASSERTED
45	01/06/2016	20:13:10.4813	PCT11Q	DEASSERTED
44	01/06/2016	20:13:10.5413	PCT11Q	ASSERTED
43	01/06/2016	20:13:10.6163	PSV21	ASSERTED
42	01/06/2016	20:13:10.6163	PCT01Q	ASSERTED
41	01/06/2016	20:13:10.6188	PSV22	ASSERTED
40	01/06/2016	20:13:10.6188	PCT02Q	ASSERTED
39	01/06/2016	20:13:10.6213	PSV23	ASSERTED
38	01/06/2016	20:13:10.6213	PCT03Q	ASSERTED
37	01/06/2016	20:13:10.6263	PSV23	DEASSERTED
36	01/06/2016	20:13:10.6263	PCT03Q	DEASSERTED
35	01/06/2016	20:13:10.7588	PSV22	DEASSERTED
34	01/06/2016	20:13:10.7588	PCT02Q	DEASSERTED
33	01/06/2016	20:13:10.7638	PSV21	DEASSERTED
32	01/06/2016	20:13:10.7638	PCT01Q	DEASSERTED
31	01/06/2016	20:13:10.8188	OUT101	DEASSERTED
30	01/06/2016	20:13:10.8188	OUT104	DEASSERTED
29	01/06/2016	20:13:10.8188	OUT106	DEASSERTED
28	01/06/2016	20:13:10.8963	PSV21	ASSERTED
27	01/06/2016	20:13:10.8963	PCT01Q	ASSERTED
26	01/06/2016	20:13:10.8963	OUT101	ASSERTED
25	01/06/2016	20:13:10.8963	OUT104	ASSERTED
24	01/06/2016	20:13:10.8963	OUT106	ASSERTED
23	01/06/2016	20:13:10.9063	PSV22	ASSERTED
22	01/06/2016	20:13:10.9063	PCT02Q	ASSERTED
21	01/06/2016	20:13:10.9188	PSV22	DEASSERTED
20	01/06/2016	20:13:10.9188	PCT02Q	DEASSERTED
19	01/06/2016	20:13:10.9338	PSV21	DEASSERTED
18	01/06/2016	20:13:10.9338	PCT01Q	DEASSERTED

17	01/06/2016	20:13:11.2963	OUT101	DEASSERTED
16	01/06/2016	20:13:11.2963	OUT104	DEASSERTED
15	01/06/2016	20:13:11.2963	OUT106	DEASSERTED
14	01/06/2016	20:13:20.7438	PCT11Q	DEASSERTED
13	01/06/2016	20:16:57.2263	PCT01Q	ASSERTED
12	01/06/2016	20:16:57.2413	PCT02Q	ASSERTED
11	01/06/2016	20:16:57.2988	PCT02Q	DEASSERTED
10	01/06/2016	20:16:57.3263	PCT01Q	DEASSERTED
9	01/06/2016	20:19:07.2563	OUT105	DEASSERTED
8	01/06/2016	22:11:09.5831	IN202	DEASSERTED
7	01/06/2016	22:11:09.6081	IN201	ASSERTED

Registro SER EDAC CEx S/E San Vicente de Tagua Tagua

Se observa en la oscilografía previa la activación del escalón N°1 por EDACxCEx en S/E San Vicente de Tagua Tagua a través del elemento auxiliar PSV21, dando orden de TRIP hacia el interruptor 52BT2 de esta S/E (0UT101=1). La frecuencia calculada de forma determinística (PMV13) al momento de la activación es de 49,41 Hz y el gradiente de frecuencia (PMV18) de -2.22 Hz/s, lo cual cumple con la condición de activación del Escalón N°1 de S/E San Vicente de Tagua Tagua (frecuencia menor a 49.5 Hz y gradiente menor a -0.9 Hz/s).

A partir de las medidas anteriores, y las medidas de los relés de las SS/EE Colchagua, Rauquén y Curicó, en donde se registraron gradientes de frecuencia en torno a -1.2 Hs/z y -1.3 Hz/s, es posible inferir que para este evento las condiciones sistémicas en la isla eléctrica que se formó alcanzaban a los niveles de actuación de este escalón, sin perjuicio del cálculo de las variables de frecuencia y su gradiente realizadas por el relé de S/E San Vicente de Tagua Tagua (cabe recordar que para el evento del EAF 187/2015 el relé se comportó de manera incorrecta).

8. Detalle de toda la información utilizada en la evaluación de la falla

- Detalle de la generación programada para el día 07 de enero de 2016 (Anexo Nº1)
- Detalle de la generación real del día 07 de enero de 2016 (Anexo Nº2)
- Detalle del Movimiento de Centrales e Informe de Novedades Relevantes del CDC correspondientes al día 07 de enero de 2016 (Anexo Nº3)
- Detalle de los mantenimientos programados y forzados para el día 07 de enero de 2016 (Anexo Nº4)
- Informes de fallas de instalaciones ingresados en el sistema CDEC por Transelec S.A., Transnet S.A., Cooperativa de Abastecimiento de Energía Eléctrica Curicó Ltda., Arauco Bioenergía S.A. e Hidroeléctrica La Higuera S.A. (Anexo Nº5)
- Otros antecedentes aportados por Transelec S.A., Transnet S.A., Arauco Bioenergía S.A. y Cooperativa de Abastecimiento de Energía Eléctrica Curicó Ltda. (Anexo Nº6)

9. Análisis de las actuaciones de protecciones

9.1 Pronunciamiento CDEC y Propiedad

La maniobra manual de apertura del 52A2 y 52A3 de S/E P. de Cortés no autorizada por el CDC provocó que centrales que inyectan en S/E Tinguiririca quedaran generando en isla alimentando los consumos de SS/EE San Fernando 154 kV y Teno 154 kV, con posterior salida de servicio de centrales y operación EDAC

La propiedad de la instalación afectada corresponde a Transelec S.A.

9.2 Desempeño Protecciones Eléctricas

De acuerdo con los antecedentes proporcionados por los coordinados involucrados:

- No se produjo la operación de protecciones eléctricas para este evento

9.3 Desempeño EDAC

Ante este evento se produjo la operación de EDAC. Así, y de acuerdo con los antecedentes proporcionados por los coordinados involucrados:

- Se concluye como correcta la apertura del 52C3 (alimentador Enap) de S/E Colchagua por operación de EDAC BF, escalón 3
- Se concluye como correcta la apertura del 52C5 (alimentador Sarmiento) de S/E Rauquén por operación de EDAC BF, escalón 3
- Se concluye como correcta la apertura del 52C5 (alimentador Maggi) de S/E Colchagua por operación de EDAC BF, escalón 3
- Se concluye como correcta la apertura del 52C2 (alimentador Los Vidales) de S/E Rauquén por operación de EDAC BF, escalón 3
- Se concluye como correcta la apertura del 52C2 (alimentador Tinguiririca) de S/E Colchagua por operación de EDAC BF, escalón 5
- Se concluye como correcta la apertura del 52C1 (alimentador Miraflores) de S/E Colchagua por operación de EDAC BF, escalón 6
- Se concluye como correcta la apertura del 52C3 (alimentador Rucatremo) de S/E Curicó por operación de EDAC BF, escalón 4
- Se concluye como correcta la apertura del 52C4 (alimentador Quilvo) de S/E Rauquén por operación de EDAC BF, escalón 2
- Se concluye como correcta la apertura del 52C5 (alimentador Aguas Negras) de S/E Curicó por operación de EDAC BF, escalón 1
- Se concluye como correcto el deslastre de cargas en S/E Teno MDP por operación de EDAC BF, escalón 1
- Se concluye como correcta la apertura del 52C7 (alimentador Los Niches) de S/E Curicó por operación de EDAC BF, escalón 4
- Se concluye como correcta la apertura del 52C6 (alimentador La Obra) de S/E Curicó por operación de EDAC BF, escalón 2
- Se concluye como incorrecta la no apertura del 52C0 (alimentador Zapallar) de S/E Curicó por operación de EDAC BF, escalón 1
- Se presume como correcta la apertura del 52BT2 (transformador Nº2) de S/E San Vicente de Tagua Tagua por operación de EDAC CEx

9.4 Desempeño EDAG

Ante este evento se produjo la operación de EDAG. Así, y de acuerdo con los antecedentes proporcionados por los coordinados involucrados:

- Faltan antecedentes para pronunciarse respecto del desempeño del EDAG en S/E Tinguiririca que actuó sobre central La Confluencia Unidad Nº1

10. Análisis de las acciones e instrucciones del CDC y la actuación de los CC que corresponda

Respecto de las actuaciones del CDC y los CC durante la falla del día 07-01-2016, se destaca el siguiente evento consignado en el Informe de Novedades relevantes del CDC:

Hora	Observación
01:12	S/E Punta de Cortés CC de Transelec abre interruptores de línea de 154 kV Tinguiririca – Rancagua – Alto Jahuel 1 y 2, no autorizado por el CDC. Centrales que inyectan en S/E Tinguiririca quedan generando en isla alimentando los consumos de SS/EE San Fernando y Teno. Por operación de EDAC se pierden 23 y 25 MW de consumos correspondientes a SS/EE San Fernando y Teno, se autoriza la reposición inmediata.

11. Recomendación respecto de las instalaciones a las cuales la DO debería solicitar una auditoría

Se solicitará a Hidroeléctrica La Higuera S.A. toda la información asociada a la operación del EDAG en S/E Tinguiririca

Se solicitará a Transnet informar el estado de avance y/o resultados asociado a la revisión del EDAC BF del 52C0 (alimentador Zapallar) de S/E Curicó

Para el análisis de esta falla no se requirió la realización de auditorías en ninguna de las instalaciones del SIC

ANEXO Nº 1
Detalle de la generación programada para el día 07 de enero de 2016

Operación Programada del Sistema Interconectado Central

jueves 07 enero 2016

Centrales	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Prog.
Pasada	1,629	1,613	1,605	1,600	1,586	1,585	1,585	1,583	1,593	1,666	1,769	1,776	1,785	1,776	1,776	1,776	1,755	1,764	1,712	1,700	1,746	1,782	1,769	1,749	40,680
Molles	7	5	5	5	5	5	5	5	5	7	17	18	18	8	4	4	4	4	4	2	1	18	18	18	192
Sauce Andes	1	1	1	1	1	1	1	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	19
Aconcagua Ublanco	54	54	54	54	54	54	54	54	54	54	55	55	55	55	55	55	55	55	55	55	55	55	55	55	1,310
Aconcagua Ujuncal	24	24	24	24	24	24	24	24	24	24	24	24	25	25	25	25	25	25	25	25	25	25	25	25	588
Los Quilos	35	35	35	35	35	35	35	35	35	27	27	27	35	35	35	35	35	35	35	35	35	35	35	35	816
Florida	25	24	23	23	23	23	24	23	13	12	12	12	12	12	12	12	12	12	12	12	22	21	21	22	419
Maitenes	12	12	13	12	12	13	13	12	12	13	13	13	13	12	12	13	13	12	12	13	13	12	13	12	300
Alfalfal	160	160	160	158	158	156	156	155	155	145	145	151	150	145	145	145	145	145	150	152	145	156	156	155	3,648
Queltehues	39	40	40	39	40	40	39	39	40	40	40	40	41	40	40	41	42	41	42	42	41	41	42	42	971
Puntilla	11	12	12	12	12	11	11	11	11	12	14	11	12	12	14	12	13	12	12	12	13	13	13	12	290
Volcán	13	13	13	13	13	12	13	13	12	12	13	13	13	12	13	13	13	12	13	13	13	13	13	13	307
Los morros	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1	0	3	3	3	3	3	3	67
Sauzal	73	70	72	72	71	72	71	72	72	72	71	70	70	71	73	73	72	71	70	70	71	72	71	71	1,713
Sauzal 60 Hz	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sauzalito	12	11	12	12	12	12	12	12	12	12	12	12	11	12	12	12	12	12	11	11	11	12	12	12	283
Curillinque	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	2,016
San Ignacio	5	5	5	5	5	5	5	5	5	5	34	34	34	34	34	34	34	34	34	34	34	34	34	34	526
Loma Alta	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	888
Rucúe	61	61	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	1,486
Pullinque	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	30	30	30	30	30	30	15	450
Pilmaiquén	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	480
Capullo	5	5	5	5	4	4	4	5	5	5	6	6	5	5	5	5	5	5	5	5	5	5	5	5	119
Peuchén	0	0	0	0	0	0	0	0	0	0	37	37	37	37	37	37	37	37	30	18	0	0	0	0	344
Mampil	0	0	0	0	0	0	0	0	14	0	18	23	23	23	23	23	23	23	20	20	19	8	0	0	260
Chacabuquito	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Antuco	162	162	162	162	162	162	162	162	162	162	162	162	162	162	162	162	162	162	162	162	162	162	162	162	3,888
Abanico	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	840
Isla	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	1,608
Eyzaguirre	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
Quilleco	26	26	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	646
El Rincon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chiburgo	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	3	3	3	20	429
Palmucho	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	744
Hornitos	54	54	54	54	54	54	54	54	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	1,312
Puclaro	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
Ojos de Agua	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	120
Coya	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	288
Lircay	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	480
El Manzano	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	72
Pehui	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Truful-Truful	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
La Paloma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trueno	1	0	1	1	0	1	1	0	1	1	1	0	1	1	0	1	1	1	1	1	0	1	1	0	17
San Clemente	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	120
Los Bajos	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	120
Auxiliar del Maipo	4	4	4	4	4	4	4	4	4	2	3	3	3	3	3	4	3	4	4	3	3	3	3	4	84
La Higuera	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	2,040
Juncalito	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
El Tártaro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Guayacan	12	13	13	13	12	12	12	12	12	12	13	13	13	13	13	12	13	13	12	13	13	13	13	13	303
Confluencia	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	1,968
Mariposas	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	72
Los Corrales	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	23
Los Corrales II	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
Carena	10	10	10	10	10	10	10	10	10	8	8	8	8	10	10	10	10	10	10	10	10	10	10	10	232
Diuto	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	72
Dongo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mallarauco	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	72
Lican	0	0	0	0	0	0	0	0	0	8	8	8	8	8	8	8	8	8	8	8	8	6	0	0	102
Chacayes	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	2,640
Muchi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
La Arena	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Allipén	3	2	3	2	2	2	2	3	3	3	3	3	3	3	3	2	3	2	2	2	2	2	2	2	59
Nalcas	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
Callao	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Reca	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Purisima	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rucatayo	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	480
Providencia	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
Robleria	3	3	3	3	3	3	3	3	2	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	69
Don Walterio	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	48
El Canelo	2	2	2	2	2	2	2	2	2	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	23
MC1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	48
MC2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
Ensenada	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Renaico	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	144
Rio Huasco	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
Las Vertientes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
El Llano	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
Los Hierros	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	96
Los Padres	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
San Andrés	35	35	30	30	30	30	30	30	35	35	35	35	35	40	40	40	40	40	40	40	40	40	40	40	865
Maisan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Collil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Las Flores	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
Laja 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Angostura	80	70	60	60	50	50	50	50	50	150	150	150	150	150	150	150	130	130	80	80	160	180	180	160	2,670
Llauquereo	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
Picoiquén	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	72
Los Hierros II	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
Trailelfú	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quillaileo	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	5
Pichilonco	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
Térmicas	2,705	2,705	2,705	2,705	2,705	2,705	2,705	2,705	2,810	2,853	2,854	2,953	2,945	2,933	2,924	2,932	2,948	2,990	2,957	2,957	2,957	2,957	2,957	2,957	68,524
TAL - TAL 2_GNL_1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TAL - TAL 2_GNL_2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tal - Tal 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tal - Tal 2_diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TAL - TAL 1_GNL_1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TAL - TAL 1_GNL_2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tal - Tal 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tal - Tal 1_diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diego de Almagro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
El Salvador	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Guacolda 1	125	125	125	125	125	125	125	125	125	125	100	60	60	60	60	60	60	60	125	125	125	125	125	125	2,520
Guacolda 2	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	3,648
Guacolda 3	0	0	0	0	0	0	0	0	5	48	74	95	107	115	126	134	150	152	152	152	152	152	152	152	1,918
Guacolda 4	152	152	152	152	152	152	152	152	152	152	152	140	120	100	80	80	80	120	152	152	152	152	152	152	3,304
Guacolda 5	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	3,648
Huasco TG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Huasco TG_IFO180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
L.Verde TG (18 MW)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Los Vientos TG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nehuenco gas + Nehuenco gas_C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nehuenco diesel + Nehuenco die	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nehuenco GNL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nehuenco 9B gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nehuenco 9B diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nehuenco 9B GNL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nehuenco II CC + Nehuenco II CA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nehuenco II diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nehuenco II GNL	260	260	260	260	260	260	260	260	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	7,840
San Isidro gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
San Isidro diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
San Isidro GNL	0	0	0	0	0	0	0	0	0	0	0	130	130	130	130	130	130	130	0	0	0	0	0	0	910
San Isidro II gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
San Isidro II diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
San Isidro II GNL	380	380	380	380	380	380	380	380	380	380	380	380	380	380	380	380	380	380	380	380	380	380	380	380	9,120
San Isidro II GNL_CA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ventanas 1	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	2,520
Ventanas 2	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	3,600
Nueva Ventanas	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	6,000
Laguna Verde	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nueva Renca GNL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nueva Renca FA_GLP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nueva Renca FA_GNL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nueva Renca	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nueva Renca diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Renca	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Campiche	272	272	272	272	272	272	272	272	272	272	272	272	272	272	272	272	272	272	272	272	272	272	272	272	6,528
Celco	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	120
Petropower 1	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	1,560
Laja	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	216
Bocamina I	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bocamina II	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arauco	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	240
Cholguán	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	216
Licantén	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	144
Valdivia	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	912
Antilhue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Horcones TG (24 MW)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Horcones TG_diesel (24 MW)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Coronel TG (43 MW)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Coronel TG diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nueva Aldea 1	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	360
Nueva Aldea 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nueva Aldea 3	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	888

Viñales	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	528
Candelaria 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Candelaria 1_die	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Candelaria 1_GNL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Candelaria 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Candelaria 2_die	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Candelaria 2_GNL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trongol (2.8 MW)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lebu (2.5 MW)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cañete (3.1 MW)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Traiguen (1.7 MW)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Curacautin (2.2 MW)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Collpulli (2.5 MW)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Yungay_1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Yungay_2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Yungay_3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Yungay_4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Yungay_1 _GAS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Yungay_2_GAS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casablanca 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casablanca 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Las Vegas (2.3 MW)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Curauma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Con Con (2.7 MW)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ESCUADRON (ex FPC)	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	288
Constitucion 1_elektr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maule	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Monte Patria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Punitaqui	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EnorEsperanza_DS1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EnorEsperanza_DS2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EnorEsperanza_TG1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Degañ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Olivos	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
El_Totoral	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quintay	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Placilla	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CHILOE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quellon_2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Colmito Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Colmito GNL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Los Pinos	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chuyaca	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Skretting	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cenizas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Lidia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trapen	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Espinos	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
San Gregorio + Linares	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eagon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Salmofood I	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Teno	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Newen_diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Newen_gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Watts I	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Watts II	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Multiexport I	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Multiexport II	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cardones	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quintero DIESEL A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quintero DIESEL B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quintero GNL A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quintero GNL B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Louisiana Pacific	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peñon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
San_Lorenzo_U1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
San_Lorenzo_U2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
San_Lorenzo_U3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tapihue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Termopacifico	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Loma Los Colorados I	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
Loma Los Colorados II	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	384
Emelda U1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Emelda U2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
COLIHUES HFO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
COLIHUES DIESEL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Curicó	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PUNTA_COLORADA_IFO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PUNTA_COLORADA_DIESEL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Masisa	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	120
Calle-Calle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cementos_Bio-Bio_F_OIL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cementos_Bio-Bio_DIE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Southern	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lautaro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tomaval	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Skretting Osorno	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Energía Pacífico	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lonquimay	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tirúa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lautaro-Comasa	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	624
Lautaro-Comasa 2	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	528
Danisco	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
JCE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Maria	355	355	355	355	355	355	355	355	355	355	355	355	355	355	355	355	355	355	355	355	355	355	355	355	8,520
Laja CMPC	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	360
Santa Fe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CMPC Pacífico	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	552
Santa Marta	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	264
CMPC Santa Fe	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	120
Los Guindos	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Embalse	**1,595**	**1,188**	**934**	**851**	**811**	**863**	**1,006**	**1,140**	**1,522**	**1,889**	**1,911**	**1,853**	**1,812**	**1,802**	**1,924**	**2,056**	**2,133**	**1,983**	**1,886**	**1,873**	**1,933**	**2,312**	**2,317**	**1,945**	**39,539**
Cipreses	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	2,232
Rapel	0	0	0	0	0	0	0	0	0	225	275	275	200	200	150	150	150	50	0	0	0	190	190	40	2,095
El Toro	210	210	210	211	211	211	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	5,043
Colbún	400	300	0	0	0	0	100	100	240	320	320	300	300	300	300	300	300	300	300	300	300	300	300	300	5,680
Machicura	32	32	32	32	32	32	32	32	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	1,568
Canutillar	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	3,840
Pehuenche	380	120	120	0	0	0	120	250	327	359	221	183	217	207	299	411	488	488	441	428	438	447	452	420	6,816
Pangue	80	60	60	60	60	70	70	70	70	100	210	210	210	210	240	260	260	260	260	260	310	440	440	300	4,570
Ralco	240	213	259	295	255	297	221	225	340	340	340	340	340	340	390	390	390	340	340	340	340	390	390	340	7,695
Eólicas	**76**	**68**	**82**	**82**	**90**	**97**	**115**	**123**	**100**	**73**	**96**	**135**	**174**	**201**	**187**	**180**	**153**	**122**	**89**	**67**	**62**	**46**	**52**	**64**	**2,534**
Eólica Canela	0	0	0	0	0	0	0	0	0	1	2	3	5	6	6	5	4	2	1	1	0	0	0	0	36
Eólica Canela 2	0	0	0	0	0	0	0	0	1	2	6	11	14	16	17	16	12	8	5	3	1	1	1	0	114
Eólica Lebu	6	5	4	4	5	5	6	5	4	5	5	5	5	5	3	4	4	4	3	2	1	1	1	1	93
Eólica El Totoral	0	0	0	0	0	1	1	1	1	2	4	8	11	13	13	12	9	5	2	1	1	0	0	0	85
Eólica Monte Redondo	0	0	0	1	3	7	9	10	9	8	8	9	10	9	8	7	5	3	2	1	1	0	0	0	110
Eólica Ucuquer	0	0	0	0	0	0	0	0	1	2	1	0	1	0	1	3	3	3	2	2	4	1	0	2	26
Eólica Ucuquer 2	0	0	0	0	0	0	0	0	2	4	1	0	1	0	1	3	3	3	2	2	3	1	0	2	28
Eólica Talinay	1	0	0	1	5	11	16	16	13	11	12	14	15	14	12	11	10	10	9	10	12	11	6	2	222
Eólica Punta Colorada	1	0	0	2	0	0	3	8	2	2	4	7	10	9	8	8	15	15	7	0	4	3	4	0	112
Eólica Cuel	6	6	6	6	8	8	8	7	4	2	1	1	1	3	5	5	5	6	6	7	7	7	7	6	128
Eólica El Arrayan	1	0	0	0	0	2	4	5	4	4	5	11	17	18	14	9	6	5	3	2	2	1	1	1	115
Eólica San Pedro	5	7	11	12	16	14	16	18	15	13	13	10	11	8	4	2	2	3	6	9	8	12	21	27	263
Eólica Los Cururos	0	0	0	1	2	3	3	4	4	11	25	38	43	39	35	28	20	11	6	4	2	0	0	0	279
Eólica Punta Palmeras	22	3	7	2	3	0	1	2	0	0	0	0	2	9	4	10	3	2	4	0	0	0	0	0	74
Eólica Taltal	34	47	54	53	47	42	40	39	33	0	0	0	0	20	25	31	33	29	22	15	9	4	9	23	609
Eólica Talinay Poniente	0	0	0	0	1	4	8	8	7	6	9	18	28	32	31	26	19	13	9	8	7	4	2	0	240
Eólica Raki	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solares	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**54**	**168**	**275**	**332**	**367**	**387**	**388**	**380**	**370**	**348**	**311**	**246**	**134**	**15**	**0**	**0**	**0**	**3,775**
Solar Tambo Real	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	3
Solar SDGx01 (Andacollo)	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	4
Solar Esperanza	0	0	0	0	0	0	0	0	0	1	2	2	2	2	2	2	2	1	1	0	0	0	0	0	17
Solar Llano de Llampos	0	0	0	0	0	0	0	9	25	45	63	75	83	86	85	79	67	51	34	16	2	0	0	0	720
Solar San Andrés	0	0	0	0	0	0	0	6	16	28	37	44	47	48	47	45	41	35	25	14	2	0	0	0	435
Solar Santa Cecilia	0	0	0	0	0	0	0	0	0	1	1	2	2	2	2	2	2	1	0	0	0	0	0	0	15
Solar PSF Pama	0	0	0	0	0	0	0	0	0	0	1	1	1	2	1	1	1	1	0	0	0	0	0	0	9
Solar PSF Lomas Coloradas	0	0	0	0	0	0	0	0	0	0	1	1	1	2	1	1	1	1	0	0	0	0	0	0	9
Solar Diego de Almagro	0	0	0	0	0	0	0	4	15	24	26	28	29	29	28	28	28	26	22	12	1	0	0	0	300
Solar Las Terrazas	0	0	0	0	0	0	0	0	1	1	1	2	3	3	3	3	2	1	1	0	0	0	0	0	21
Solar Javiera	0	0	0	0	0	0	0	11	31	47	56	60	62	61	61	61	60	57	47	27	3	0	0	0	644
Solar Chañares	0	0	0	0	0	0	0	5	15	23	28	30	31	31	31	30	30	28	23	13	1	0	0	0	319
Solar Lalackama	0	0	0	0	0	0	0	6	20	36	42	45	48	48	48	48	46	42	32	17	2	0	0	0	480
Solar PV Salvador	0	0	0	0	0	0	0	12	37	55	57	60	59	58	58	58	58	56	50	28	3	0	0	0	649
Solar Luna	0	0	0	0	0	0	0	0	0	1	2	2	3	3	2	2	1	1	0	0	0	0	0	0	17
Solar Lalackama 2	0	0	0	0	0	0	0	1	8	12	12	11	11	9	8	8	8	9	11	7	1	0	0	0	116
Solar Sol	0	0	0	0	0	0	0	0	0	1	2	2	3	3	2	2	1	1	0	0	0	0	0	0	17
Total Generación SIC	**6,005**	**5,574**	**5,326**	**5,238**	**5,192**	**5,250**	**5,411**	**5,605**	**6,193**	**6,756**	**6,962**	**7,084**	**7,103**	**7,100**	**7,191**	**7,314**	**7,337**	**7,170**	**6,890**	**6,731**	**6,713**	**7,097**	**7,095**	**6,715**	**155,052**
Termoeléctrico	**45.0%**	**48.5%**	**50.8%**	**51.6%**	**52.1%**	**51.5%**	**50.0%**	**48.3%**	**45.4%**	**42.2%**	**41.0%**	**41.7%**	**41.5%**	**41.3%**	**40.7%**	**40.1%**	**40.2%**	**41.7%**	**42.9%**	**43.9%**	**44.0%**	**41.7%**	**41.7%**	**44.0%**	
Hidroeléctrico	**53.7%**	**50.3%**	**47.7%**	**46.8%**	**46.2%**	**46.6%**	**47.9%**	**48.6%**	**50.3%**	**52.6%**	**52.9%**	**51.2%**	**50.6%**	**50.4%**	**51.5%**	**52.4%**	**53.0%**	**52.3%**	**52.2%**	**53.1%**	**54.8%**	**57.7%**	**57.6%**	**55.0%**	
Solar	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.0%**	**2.7%**	**4.1%**	**4.8%**	**5.2%**	**5.4%**	**5.5%**	**5.3%**	**5.1%**	**4.7%**	**4.3%**	**3.6%**	**2.0%**	**0.2%**	**0.0%**	**0.0%**	**0.0%**	
Eólico	**1.27%**	**1.22%**	**1.54%**	**1.57%**	**1.73%**	**1.85%**	**2.13%**	**2.19%**	**1.61%**	**1.08%**	**1.38%**	**1.91%**	**2.45%**	**2.83%**	**2.60%**	**2.46%**	**2.09%**	**1.70%**	**1.29%**	**1.00%**	**0.92%**	**0.65%**	**0.73%**	**0.95%**	

ANEXO Nº 2
Detalle de la generación real del día 07 de enero de 2016

Operación Real del Sistema Interconectado Central (MWh)

jueves 07 enero 2016

																								Generación		
Centrales	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Real	Máxima	Prog.
Pasada	1,801	1,538	1,524	1,551	1,586	1,610	1,614	1,627	1,624	1,641	1,696	1,724	1,754	1,749	1,755	1,752	1,743	1,803	1,852	1,785	1,785	1,821	1,824	1,803	40,961	1,852	40,680
Los Molles	5.0	3.0	3.0	3.0	3.0	3.0	3.0	6.0	11.0	18.0	18.0	18.0	9.0	5.0	5.0	5.0	3.0	3.0	3.0	3.0	12.0	18.0	18.0	10.0	188	18	192
Sauce Andes	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.8	0.9	0.9	0.9	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	24	1	19
Aconcagua Ublanco	55.4	55.4	55.3	55.1	55.3	55.0	54.9	54.3	52.8	51.6	51.0	50.7	50.5	50.3	50.0	50.2	51.1	53.3	55.3	55.4	55.4	55.4	55.4	55.3	1,284	55	1,310
Aconcagua Ujuncal	24.5	23.2	24.0	25.5	25.2	26.1	27.0	27.7	26.9	27.0	27.0	27.5	27.4	27.4	27.4	27.1	25.4	26.3	26.9	26.9	27.0	27.1	27.0	27.0	635	28	588
Los Quilos	34.2	35.5	34.1	35.1	35.1	35.3	33.7	35.2	34.8	35.3	35.0	34.0	34.5	34.7	35.1	34.3	34.9	35.9	36.3	36.3	36.6	36.4	36.7	36.9	846	37	816
Florida 1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	72	3	0
Florida 2	18.0	19.0	18.0	18.0	19.0	18.0	18.0	18.0	10.0	9.0	10.0	10.0	10.0	10.0	9.0	10.0	10.0	9.0	14.0	15.0	16.0	17.0	17.0	18.0	340	19	419
Florida 3	2.0	2.0	2.0	3.0	2.0	2.0	2.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	51	3	0
Maitenes	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.0	12.0	12.0	12.0	12.0	12.0	296	13	300
Alfalfal	150.1	151.6	153.6	148.0	144.6	140.6	132.5	136.7	136.3	134.8	134.6	132.5	132.1	131.5	129.3	129.5	129.4	130.6	138.6	140.3	143.8	148.7	153.9	152.9	3,357	154	3,648
Queltehues	39.0	39.0	39.0	39.0	39.0	39.0	38.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0	42.0	41.0	41.0	41.0	41.0	42.0	971	42	971
Puntilla	16.0	16.5	16.9	17.0	16.8	16.9	17.6	17.6	17.2	16.1	15.3	16.6	17.5	14.5	17.3	17.0	15.9	14.5	15.7	16.5	16.0	16.3	16.0	16.1	394	18	290
Volcan	13.0	13.0	13.0	13.0	12.0	13.0	13.0	12.0	13.0	13.0	12.0	13.0	13.0	13.0	12.0	13.0	13.0	13.0	12.0	13.0	13.0	13.0	13.0	13.0	307	13	307
Los Morros	3.0	3.1	3.1	2.9	3.0	2.9	3.0	2.9	2.9	2.9	3.0	2.9	3.0	2.8	3.1	3.1	3.1	3.1	3.1	3.0	3.1	3.0	3.1	3.0	72	3	67
Sauzal 50Hz	69.0	70.0	54.0	75.0	77.0	77.0	75.0	71.0	70.0	67.0	62.0	68.0	68.0	69.0	70.0	69.0	69.0	69.0	69.0	69.0	74.0	75.0	75.0	75.0	1,686	77	1,713
Sauzal 60Hz	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Sauzalito	11.0	10.0	0.0	0.0	0.0	5.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	12.0	11.0	11.0	225	12	283
Curillinque	84.0	85.0	85.0	84.0	84.0	84.0	84.0	83.0	83.0	83.0	83.0	82.0	83.0	82.0	84.0	82.0	83.0	82.0	82.0	82.0	83.0	83.0	84.0	84.0	1,998	85	2,016
San Ignacio	17.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	7.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	242	17	526
Loma Alta	37.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0	36.0	37.0	36.0	37.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	37.0	37.0	879	37	888
Rucue	60.0	60.0	60.0	60.0	60.0	69.0	72.0	73.0	72.0	73.0	72.0	72.0	72.0	72.0	70.0	70.0	61.0	62.0	70.0	72.0	71.0	71.0	72.0	72.0	1,638	73	1,486
Pullinque	15.1	15.1	15.1	15.1	15.1	15.1	15.1	15.1	15.1	15.1	15.2	15.1	15.1	15.1	15.1	15.1	15.4	29.4	30.2	30.2	30.1	30.1	30.2	16.0	453	30	450
Pilmaiquén	20.2	20.3	20.4	20.4	20.5	20.5	20.5	20.6	20.5	20.3	19.9	20.3	20.3	20.4	20.5	20.4	19.9	19.3	21.2	21.3	21.3	21.5	20.1	20.2	491	22	480
Capullo	4.4	4.2	4.1	4.0	4.0	4.1	4.0	4.2	4.4	5.0	5.5	5.5	5.5	5.1	4.9	4.2	4.2	4.1	4.3	4.5	4.5	4.8	4.6	4.6	109	6	119
Peuchén	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.3	34.4	37.0	37.6	38.1	38.1	38.1	38.1	38.1	38.1	38.1	30.2	8.7	0.0	0.0	435	38	344
Mampil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.3	19.2	19.1	21.5	22.0	22.0	22.0	22.0	22.0	22.0	21.4	18.9	17.3	6.2	273	22	260
Chacabuquito	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Antuco	167.0	167.0	167.0	167.0	167.0	163.0	160.0	160.0	160.0	160.0	160.0	160.0	160.0	160.0	160.0	160.0	160.0	161.0	168.0	163.0	161.0	161.0	161.0	164.0	3,897	168	3,888
Abanico	37.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	35.0	36.0	35.0	35.0	36.0	36.0	35.0	36.0	35.0	36.0	36.0	36.0	36.0	35.0	36.0	36.0	859	37	840
Isla	67.0	67.0	67.0	67.0	66.0	66.0	66.0	65.0	66.0	65.0	66.0	66.0	64.0	65.0	65.0	65.0	64.0	64.0	64.0	65.0	65.0	66.0	66.0	66.0	1,573	67	1,608
Eyzaguirre	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	29	1	24
Quilleco	24.0	24.0	24.0	24.0	25.0	27.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	31.0	30.0	29.0	25.0	25.0	29.0	29.0	30.0	31.0	31.0	678	31	646
El Rincón	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	7	0	0
Chiburgo	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	8.0	3.0	3.0	3.0	20.0	417	20	429
Palmucho	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	672	28	744
Hornitos	47.4	47.9	48.3	48.6	48.9	49.1	49.4	52.3	53.2	53.0	52.8	52.5	52.3	52.0	51.9	51.9	52.2	52.5	52.7	53.0	53.3	53.7	52.6	52.2	1,234	54	1,312
Puclaro	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	24	1	24
Ojos de Agua	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	7.7	8.2	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	201	8	120
Coya	12.1	6.9	7.9	12.0	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.0	11.6	12.0	11.8	12.0	11.8	11.8	11.9	12.1	12.0	12.0	12.1	279	12	288
Lircay	20.2	20.2	20.2	20.2	20.2	20.1	20.1	20.1	20.1	20.1	20.1	20.2	20.2	20.2	20.1	20.1	20.1	20.1	20.1	20.1	20.2	20.1	20.1	20.1	483	20	480
El Manzano	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.3	3.2	3.2	3.2	3.3	3.2	3.3	3.4	3.4	3.3	78	3	72
Pehui	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	4	0	0
Truful Truful	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	17	1	4
La Paloma	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Trueno	0.7	0.3	1.1	1.1	0.2	1.1	1.1	0.0	1.1	0.9	0.2	1.1	0.8	0.3	1.1	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	18	1	17
San Clemente	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	120	5	120
Los Bajos	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.1	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	126	5	120
Auxiliar del Maipo	3.5	3.6	3.8	3.9	3.8	3.9	3.4	3.6	3.6	3.0	3.3	3.4	3.2	3.3	3.6	3.4	3.4	3.6	3.5	3.5	3.5	3.3	3.6	3.7	84	4	84
La Higuera	154.5	74.0	83.9	84.4	84.5	84.4	84.3	84.8	84.6	84.8	84.4	85.2	84.8	84.6	85.0	84.4	84.8	84.2	84.6	84.5	85.0	85.4	84.9	85.1	2,091	155	2,040
Juncalito	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1.0	1.0	0.9	0.9	22	1	24
El Tártaro	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Guayacán	12.7	12.7	12.7	12.6	12.7	12.7	12.5	12.6	12.5	12.5	12.2	12.3	12.2	12.2	12.2	11.7	10.9	11.9	11.7	12.0	12.0	12.2	12.7	12.7	295	13	303
Confluencia	81.7	49.9	81.8	81.8	81.8	81.8	81.7	81.8	81.8	81.8	81.8	81.8	81.8	81.8	81.8	81.8	81.8	81.8	81.8	81.8	81.9	81.9	81.8	81.9	1,931	82	1,968
Mariposas	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.2	3.2	3.2	78	3	72
Los Corrales	0.5	0.7	0.6	0.5	0.6	0.6	0.7	0.7	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.6	0.6	0.6	0.5	0.6	0.6	17	1	23
Los Corrales II	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	17	1	24
Carena	9.6	9.6	9.4	9.4	9.4	9.4	8.9	9.3	8.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	9.4	9.4	9.4	9.6	9.4	9.6	9.4	9.4	164	10	232
Diuto	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.9	72	3	72
Dongo	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Mallarauco	3.5	3.4	3.5	3.5	3.4	3.5	3.4	2.7	3.3	3.5	3.5	3.6	3.6	3.6	3.6	3.4	3.4	3.2	3.2	3.2	3.2	3.1	3.1	3.1	81	4	72
Licán	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	7.4	8.4	8.2	8.4	8.2	8.4	8.3	8.2	8.2	8.1	8.0	6.7	2.9	0.0	100	8	102
Chacayes	110.9	96.1	55.4	60.3	94.2	108.0	108.5	109.1	108.9	109.1	108.5	95.8	111.7	111.5	112.2	112.0	111.9	112.1	112.5	111.5	111.7	111.9	111.6	111.0	2,506	113	2,640
Muchi	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
La Arena	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Reca	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	8	0	0
Purísima	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	10	0	0
Allipen	1.6	1.4	1.4	1.5	1.4	1.4	1.4	1.7	1.0	1.5	1.1	1.4	1.5	1.5	1.2	1.5	1.5	1.3	1.5	1.5	1.5	1.5	1.5	1.5	34	2	59
El Canelo	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.8	44	2	23
Nalcas	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	24	1	24
Callao	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	6	0	0
Rucatayo	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.6	21.4	21.2	21.2	21.2	21.2	21.2	21.2	21.1	21.4	22.0	22.7	22.9	23.0	521	23	480
Renaico	5.7	5.7	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.7	5.8	5.7	5.7	5.8	139	6	144
Providencia	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	17	1	24
Don Walterio	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	38	2	48
Robleria	2.6	2.6	2.5	0.2	2.6	2.6	2.5	2.5	2.5	2.6	2.5	2.6	2.5	2.6	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.6	59	3	69
MC1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	51	2	48
MC2	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	14	1	24
Ensenada	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Río Huasco	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	31	1	24
San Andrés	37.8	37.3	37.1	30.6	30.6	30.6	30.6	30.8	35.0	35.8	35.7	35.8	36.9	39.5	40.2	40.3	40.3	40.2	40.1	38.8	36.4	35.7	27.2	25.9	849	40	865
El Llano	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.2	1.2	1.2	1.2	1.2	31	1	24
Las Vertientes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Laja 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Los Hierros	2.6	2.7	2.7	2.8	2.9	2.9	2.9	3.0	3.1	3.1	3.1	3.1	3.0	3.1	3.0	2.9	2.7	2.7	2.5	2.5	2.5	2.6	2.7	2.8	68	3	96
Maisan	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	5	0	0
Los Padres	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	2	0	0
Alto Renaico	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Quillaileo	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	3	0	5
Pichilonco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	24
Donguil	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	3	0	0
María Elena	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	2	0	0
Collil	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3	0	1
Llauquereo	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0	0	24
Los Hierros II	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	24
Pulelfu	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.2	3.6	3.8	3.8	3.8	3.5	3.3	3.2	3.2	3.3	3.3	3.3	3.3	3.3	3.3	3.3	79	4	0
Las Flores	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	21	1	24
Picoiquén	3.4	3.4	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.5	3.4	3.4	3.4	3.4	3.4	3.4	80	4	72
Angostura	140.0	45.0	44.0	44.0	44.0	44.0	45.0	45.0	44.0	44.0	70.0	99.0	122.0	134.0	141.0	140.0	141.0	187.0	201.0	142.0	140.0	182.0	201.0	198.0	2,637	201	2,670
El Paso	40.4	7.3	17.1	26.2	27.8	27.4	34.0	36.4	38.4	39.8	39.3	40.2	39.0	32.0	28.6	28.3	28.6	28.7	28.8	28.8	28.2	29.4	28.7	30.1	734	40	0
Trailelfú	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	7	0	0
Itata	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.8	0.3	5	2	0
Térmicas	2,692	2,604	2,673	2,663	2,654	2,658	2,666	2,631	2,651	2,882	2,928	3,037	3,030	3,118	3,159	3,198	3,253	3,249	3,201	3,218	3,298	3,315	3,359	3,366	71,503	3,366	68,524
Taltal 2 GNL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Taltal 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Taltal 2 Diesel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Taltal 1 GNL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Taltal 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Taltal 1 Diesel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
D. Almagro	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
El Salvador	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Guacolda 1	132.1	132.0	132.0	132.0	133.0	132.0	132.0	132.0	132.0	132.0	132.0	97.0	60.0	60.0	60.0	60.0	60.0	60.0	94.0	108.0	130.0	130.0	130.0	129.8	2,632	133	2,520
Guacolda 2	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	149.0	149.0	149.0	149.0	149.0	149.0	149.0	149.0	3,592	150	3,648
Guacolda 3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	44.0	104.0	149.0	152.0	153.0	152.0	152.0	153.0	152.0	152.0	153.0	152.0	152.0	152.0	1,980	153	1,918
Guacolda 4	152.0	151.0	152.0	152.0	152.0	152.0	152.0	152.0	152.0	152.0	152.0	152.0	152.0	152.0	151.0	152.0	152.0	152.0	152.0	152.0	152.0	152.0	152.0	152.0	3,646	152	3,304
Guacolda 5	152.0	152.2	152.2	152.0	152.2	152.0	152.4	119.8	61.2	42.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.4	53.2	63.0	100.4	111.2	1,623	152	3,648
Huasco TG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Huasco TG IFO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
L.Verde TG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Los Vientos TG	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31.1	114.2	108.4	6.8	0.0	0.0	0.0	0.0	0.0	266	114	0
Nehuenco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Nehuenco Diesel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Nehuenco GNL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Nehuenco TG 9B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Nehuenco TG 9B Diesel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Nehuenco TG 9B GNL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Nehuenco II	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Nehuenco II Diesel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Nehuenco II GNL	291.0	264.0	264.0	264.0	265.0	263.0	264.0	277.0	365.0	363.0	365.0	359.0	358.0	356.0	357.0	355.0	352.0	355.0	357.0	357.0	362.0	363.0	364.0	364.0	7,904	365	7,840
San Isidro	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
San Isidro Diesel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
San Isidro GNL	219.0	15.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	218.0	238.0	236.0	235.0	234.0	233.0	230.0	231.0	232.0	234.0	235.0	237.0	237.0	238.0	239.0	3,743	239	910
San Isidro II	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
San Isidro II Diesel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
San Isidro II GNL	91.0	303.0	376.0	369.0	369.0	370.0	372.0	375.0	365.0	365.0	366.0	365.0	368.0	372.0	370.0	372.0	372.0	372.0	372.0	371.0	370.0	377.0	376.0	377.0	8,555	377	9,120
Ventanas 1	88.0	87.0	86.0	86.0	86.0	82.0	81.0	71.0	71.0	106.0	106.0	106.0	93.0	85.0	86.0	87.0	88.0	82.0	85.0	85.0	85.0	88.0	96.0	93.0	2,109	106	2,520
Ventanas 2	147.0	143.0	143.0	143.0	143.0	143.0	143.0	148.0	149.0	146.0	146.0	145.0	142.0	151.0	144.0	146.0	147.0	146.0	148.0	146.0	146.0	146.0	154.0	160.0	3,515	160	3,600
Nueva Ventanas	248.0	248.0	249.0	249.0	248.0	248.0	248.0	249.0	249.0	248.0	248.0	246.0	246.0	247.0	249.0	249.0	249.0	248.0	248.0	247.0	247.0	247.0	247.0	247.0	5,949	249	6,000
L.Verde TV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Nueva Renca GNL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Nueva Renca FA_GLP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Nueva Renca FA_GNL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Nueva Renca	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Nueva Renca Diesel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Renca U1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Renca U2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Campiche	272.0	272.0	272.0	272.0	272.0	272.0	272.0	272.0	272.0	272.0	272.0	272.0	272.0	273.0	272.0	272.0	272.0	272.0	272.0	272.0	272.0	272.0	272.0	272.0	6,529	273	6,528
Constitución A. Biomasa	1.6	2.2	2.6	4.4	3.7	3.5	2.8	3.1	5.5	7.4	6.6	6.6	4.2	6.1	5.8	5.6	6.2	6.9	6.1	6.6	7.1	7.0	6.4	4.6	123	7	120
Constitución A. IFO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Petropower	55.0	55.0	55.0	55.0	55.0	55.0	55.0	53.0	55.0	54.0	53.0	52.0	52.0	52.0	52.0	50.0	51.0	51.0	53.0	52.0	52.0	53.0	53.0	54.0	1,277	55	1,560
Laja	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	7.0	6.0	7.0	6.0	7.0	6.0	7.0	6.0	8.0	6.0	150	8	216
Bocamina	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Bocamina 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Arauco	17.7	15.7	16.4	17.8	18.3	18.3	17.5	7.6	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.6	14.4	12.8	12.1	13.1	190	18	240
Cholguán Biomasa	7.0	6.7	6.6	7.1	7.1	7.1	7.3	8.6	9.7	9.1	10.2	9.7	8.0	8.4	8.1	7.6	7.5	7.7	8.7	8.8	8.5	8.6	8.2	7.7	194	10	216
Cholguán IFO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Licantén Biomasa	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	144
Licantén LN	4.3	4.6	4.7	4.8	4.6	4.8	4.8	4.8	5.0	4.6	3.6	5.0	3.9	4.0	4.2	4.3	4.5	4.1	4.1	4.2	4.4	4.7	4.5	4.9	107	5	0
Valdivia LN	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	264	11	912
Valdivia Biomasa	23.2	21.4	26.9	22.2	20.7	22.1	21.7	11.2	3.5	4.1	4.6	4.2	4.3	4.1	3.3	4.2	3.4	4.5	23.0	26.3	30.4	34.1	30.1	29.9	383	34	0
Valdivia IFO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Antilhue TG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Horcones TG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Horcones Diesel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
TG_Coronel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
TG_Coronel Diesel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Nueva Aldea	9.5	9.1	9.2	10.4	10.0	9.9	10.0	11.3	11.0	11.6	12.1	14.3	14.3	14.1	13.1	13.0	12.5	10.4	10.7	10.8	10.3	9.0	7.7	6.3	261	14	360
Nueva Aldea 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Nueva Aldea 3	26.4	27.1	25.9	24.9	23.9	26.4	26.3	30.8	34.8	35.8	38.3	38.8	39.3	37.8	38.3	40.1	40.4	44.1	43.8	39.6	36.2	29.5	26.6	24.1	799	44	888
Viñales	31.6	31.1	31.7	30.1	30.0	30.0	30.0	31.1	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	31.9	31.9	28.3	28.0	28.0	27.9	28.0	28.0	734	32	528
Candelaria 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Candelaria 1 Diesel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Candelaria 1 GNL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Candelaria 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Candelaria 2 Diesel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Candelaria 2 GNL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Curanilahue	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Lebu	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Cañete	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Chufkén (Traiguén)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Curacautin	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Collipulli	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Yungay G1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0

Yungay G2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Yungay G3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Yungay Diesel 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Yungay Diesel 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Yungay Diesel 3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Yungay 4ca	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Casablanca 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1	0	0
Casablanca 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Las Vegas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Curauma	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1	1	0
Concon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Escuadrón (ex FPC)	9.4	9.4	9.4	8.4	8.4	9.4	9.6	9.9	9.9	10.4	10.1	10.1	10.1	9.5	10.1	9.0	10.0	10.3	10.6	10.5	9.4	9.3	9.9	8.0	231	11	288
Constitución 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0	0	0
Maule	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	2	2	0
Monte Patria	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Punitaqui	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Esperanza 1	0.0	0.0	0.0	0.0	0.7	1.4	1.4	1.4	1.4	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7	1	0
Esperanza 2	0.0	0.0	0.0	0.0	0.8	1.6	1.6	1.6	1.6	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8	2	0
Esperanza TG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Degan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Olivos	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Totoral	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2	1	0
Quintay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Placilla	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Chiloé	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Quellon II	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Colmito GNL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Colmito Diesel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Los Pinos	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Chuyaca	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Skretting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Cenizas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Santa Lidia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Trapén	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.8	27.3	21.2	28.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	85	28	0
Los Espinos	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
San Gregorio	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Linares Norte	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Biomar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Eagon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Salmofood I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Teno	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Newen Diesel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Newen Butano	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Newen Propano	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Newen Gas Natural	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Newen Mezcla Butano/Propano	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Watts I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Watts II	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Multiexport I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Multiexport II	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Los Álamos	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Cardones	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Quintero DIESEL A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Quintero DIESEL B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Quintero GNL A	17.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	61.0	114.0	116.0	115.0	115.0	116.0	116.0	116.0	117.0	117.0	117.0	1,237	117	0
Quintero GNL B	35.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.0	118.0	116.0	116.0	117.0	116.0	115.0	116.0	116.0	117.0	117.0	117.0	116.0	116.0	1,574	118	0
Louisiana Pacific	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
El Peñón	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1	1	0
San Lorenzo de D. de Almagro U1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
San Lorenzo de D. de Almagro U2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
San Lorenzo de D. de Almagro U3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Tapihue	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Termopacífico	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Loma Los Colorados I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	24
Loma Los Colorados II	14.1	14.1	13.9	14.0	14.0	14.0	13.9	14.0	13.8	13.0	13.7	13.5	13.2	13.5	13.5	13.5	13.1	13.4	13.4	12.5	12.5	13.4	13.7	13.7	325	14	384
Emelda U1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Emelda U2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Colihues IFO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Colihues DIE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Curicó	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Punta Colorada IFO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Punta Colorada Diesel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Cabrero	7.6	7.5	7.5	7.5	7.7	8.0	8.2	8.2	7.7	8.1	7.6	8.0	8.1	8.1	7.8	7.9	7.9	7.9	8.0	8.0	8.0	8.0	8.0	7.9	189	8	120
Calle-Calle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Cem Bio Bio IFO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	8.1	8.5	1.1	0.0	0.0	0.0	0.0	0.0	20	9	0
Cem Bio Bio DIESEL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Southern	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Lautaro	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
HBS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Tomaval	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Skretting Osorno	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Energía Pacífico	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Lonquimay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Tirúa	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Lautaro-Comasa	26.1	26.0	25.8	24.1	25.3	26.0	26.0	26.1	26.0	26.0	26.0	26.3	26.0	26.0	26.3	26.0	26.1	25.8	26.1	26.1	26.1	26.3	26.0	26.1	623	26	624
Lautaro-Comasa 2	20.3	20.2	20.1	20.3	20.4	20.0	20.3	19.8	20.2	20.0	20.3	20.1	20.0	20.1	19.8	20.4	20.3	20.3	20.2	20.4	20.1	19.9	20.3	20.4	484	20	528
Danisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Contulmo	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
JCE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Santa María	355.0	355.0	355.0	356.0	354.0	355.0	354.0	354.0	354.0	353.0	353.0	353.0	353.0	354.0	354.0	353.0	352.0	353.0	353.0	354.0	353.0	355.0	354.0	354.0	8,493	356	8,520
Estancilla	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Trebal Mapocho	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Laja CMPC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.4	0.0	0.4	2	1	360
Tamm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Ancali	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Sta Fe	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Santa Marta	10.7	10.7	10.7	10.5	10.5	10.4	10.4	10.5	10.4	10.4	10.4	10.5	10.4	10.4	10.4	10.4	10.3	10.4	10.4	10.4	10.4	10.4	10.5	10.5	251	11	264
Santa Irene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Las Pampas	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	6	0	0
CMPC Pacífico	19.3	20.7	23.2	24.1	25.4	26.5	26.1	26.7	27.7	26.8	27.1	26.9	28.0	28.0	27.7	27.1	23.8	23.6	23.1	23.0	20.4	20.4	20.1	19.1	585	28	552
Energía León (Coelemu)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	4.0	4.0	4.2	4.5	4.4	4.7	4.4	4.5	4.2	4.3	4.3	4.5	4.5	4.5	4.5	4.5	99	5	0
CMPC Santa Fe	9.7	7.1	10.2	9.5	10.3	10.4	10.6	10.5	10.4	8.9	9.5	10.5	10.5	10.0	11.5	12.3	11.9	10.9	11.1	10.7	10.3	9.9	9.6	9.9	246	12	120
Biocruz	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Los Guindos	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
CMPC Cordillera	23.0	22.1	21.6	22.0	12.6	13.3	21.3	20.7	20.6	21.5	22.1	22.2	21.8	21.1	20.8	21.0	20.7	21.1	22.3	23.3	23.4	23.3	23.2	22.2	507	23	0
CMPC Tissue	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Andes Generación	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Embalse	**1,603**	**1,348**	**1,013**	**982**	**974**	**1,029**	**1,124**	**1,218**	**1,550**	**1,737**	**1,914**	**1,941**	**1,981**	**1,856**	**1,920**	**1,856**	**1,757**	**1,623**	**1,369**	**1,310**	**1,430**	**1,868**	**1,824**	**1,476**	**36,703**	**1,981**	**39,539**
Cipreses	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0	93.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0	95.0	92.0	92.0	2,212	95	2,232
Rapel	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.0	99.0	117.0	129.0	116.0	136.0	124.0	60.0	17.0	0.0	0.0	0.0	78.0	84.0	84.0	1,090	136	2,095
El Toro	252.0	228.0	233.0	238.0	240.0	240.0	236.0	240.0	240.0	242.0	237.0	244.0	237.0	235.0	239.0	231.0	232.0	234.0	250.0	250.0	252.0	252.0	248.0	248.0	5,778	252	5,043
Colbun	402.0	310.0	45.0	0.0	0.0	17.0	172.0	203.0	268.0	304.0	350.0	351.0	351.0	351.0	371.0	351.0	351.0	342.0	151.0	100.0	102.0	219.0	239.0	209.0	5,559	402	5,680
Machicura	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	36.0	33.0	32.0	32.0	33.0	33.0	33.0	33.0	34.0	34.0	34.0	34.0	34.0	930	45	1,568
Canutillar	154.0	154.0	156.0	156.0	157.0	157.0	157.0	157.0	157.0	157.0	156.0	155.0	155.0	155.0	155.0	156.0	156.0	157.0	157.0	157.0	157.0	156.0	156.0	155.0	3,745	157	3,840
Pehuenche	242.0	197.0	127.0	127.0	127.0	135.0	126.0	127.0	285.0	347.0	372.0	345.0	378.0	308.0	264.0	259.0	205.0	161.0	124.0	133.0	179.0	371.0	324.0	230.0	5,493	378	6,816
Pangue	159.0	129.0	80.0	80.0	80.0	80.0	80.0	86.0	129.0	180.0	226.0	254.0	254.0	252.0	274.0	300.0	300.0	300.0	267.0	210.0	257.0	300.0	302.0	149.0	4,728	302	4,570
Ralco	256.0	193.0	235.0	244.0	233.0	263.0	216.0	268.0	334.0	325.0	337.0	346.0	352.0	315.0	357.0	310.0	328.0	287.0	295.0	334.0	357.0	363.0	345.0	275.0	7,168	363	7,695
Eólicas	**107**	**95**	**50**	**20**	**21**	**19**	**17**	**34**	**23**	**30**	**36**	**46**	**72**	**110**	**89**	**102**	**110**	**90**	**86**	**66**	**49**	**30**	**14**	**25**	**1,339**	**110**	**2,534**
Eólica Canela 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	1.8	1.1	2.8	1.3	1.2	0.9	0.6	0.0	0.0	0.0	0.0	0.0	10	3	36
Eólica Canela 2	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.5	4.3	4.4	3.9	2.8	2.7	1.6	2.3	0.9	0.1	0.0	0.0	0.0	24	4	114
Eólica Lebu	0.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	1.6	0.3	1.0	1.7	1.9	1.0	0.3	0.1	0.0	0.0	0.0	0.0	9	2	93
Eólica Totoral	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	1.8	4.4	10.3	7.8	6.0	3.6	3.1	1.8	2.3	0.8	0.0	0.0	0.0	0.0	43	10	85
Eólica Monte Redondo	0.0	0.0	0.0	0.0	0.1	1.1	1.9	2.2	1.7	3.6	3.3	6.1	6.5	9.6	7.0	3.8	1.9	1.4	1.0	0.1	0.0	0.0	0.0	0.0	51	10	110
Eólica Ucuquer	0.0	0.1	0.7	1.3	1.9	1.4	1.4	1.6	0.5	0.9	1.2	1.0	1.2	0.5	0.2	0.9	1.2	1.6	1.1	1.8	1.8	1.7	1.3	0.7	26	2	26
Eólica Ucuquer 2	0.0	0.0	0.2	1.2	1.6	1.2	1.2	1.6	0.6	0.9	1.6	1.8	1.6	0.7	0.2	1.9	2.3	2.5	2.8	2.5	2.8	2.7	2.3	1.1	35	3	28
Eólica Talinay	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	3.3	8.4	4.8	2.1	7.8	10.9	11.3	11.9	9.9	10.0	8.3	4.6	3.6	0.4	0.0	98	12	222
Eólica Punta Colorada	0.4	0.8	0.4	0.0	0.2	0.6	2.9	2.2	0.0	0.0	0.0	1.5	0.7	6.5	7.3	13.2	12.7	9.4	8.1	13.5	12.0	8.2	4.5	2.4	108	14	112
Eólica Cuel	1.9	0.1	2.6	5.4	8.1	3.4	0.0	5.0	4.8	0.2	0.0	0.0	1.2	3.8	3.4	4.9	12.1	11.0	7.6	8.9	9.4	6.7	4.4	7.6	113	12	128
Eólica El Arrayán	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	5.7	3.9	3.4	5.1	10.2	14.7	4.5	2.9	2.8	1.1	0.4	0.0	0.0	0.0	0.0	0.0	57	15	115
Eólica San Pedro	18.0	14.7	15.1	9.1	6.8	6.1	4.9	3.1	1.9	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	81	18	263
Eólica Los Cururos	0.0	0.0	0.0	0.0	0.0	0.4	1.1	1.7	2.3	3.6	10.5	12.9	10.6	12.4	9.0	10.0	4.1	2.1	3.0	0.2	0.0	0.0	0.0	0.0	84	13	279
Eólica Punta Palmeras	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.0	2.3	12.8	18.7	13.0	5.0	2.8	1.4	0.7	0.1	0.0	0.0	0.0	0.0	58	19	74
Eólica Taltal	85.6	79.1	31.1	3.0	1.8	3.2	3.2	13.2	3.6	6.2	0.0	0.0	0.0	0.0	0.0	17.3	34.3	33.5	35.6	22.8	14.8	3.0	0.9	12.8	405	86	609
Eólica Talinay Poniente	0.0	0.0	0.0	0.0	0.6	1.3	0.1	0.6	1.9	5.9	3.6	5.1	7.1	21.4	19.4	21.5	14.3	10.4	10.4	6.0	3.4	4.3	0.3	0.0	138	22	240
Eólica Raki	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Solares	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**61**	**297**	**367**	**368**	**376**	**384**	**379**	**369**	**347**	**336**	**315**	**326**	**221**	**19**	**0**	**0**	**0**	**4,164**	**384**	**3,775**
Solar Tambo Real	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	3
Solar SDGx01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.5	0.7	0.7	0.8	0.9	0.4	0.6	0.7	0.5	0.3	0.1	0.0	0.0	0.0	0.0	6	1	4
Solar Esperanza	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.8	1.4	1.9	2.1	2.3	2.3	2.2	1.8	1.3	0.7	0.2	0.0	0.0	0.0	0.0	17	2	17
Solar Llano de Llampos	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.8	59.8	77.0	81.6	84.8	86.0	85.8	84.7	83.5	82.4	79.4	70.1	42.7	2.6	0.0	0.0	0.0	932	86	720
Solar San Andrés	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	13.9	20.3	20.8	22.4	24.6	24.5	23.5	22.1	22.4	22.3	20.9	9.3	0.7	0.0	0.0	0.0	250	25	435
Solar Santa Cecilia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	15
Solar Techos de Altamira	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	1	0	0
Solar Diego de Almagro	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	3.7	8.9	9.4	9.7	12.8	12.8	12.7	11.5	11.5	10.8	7.3	1.9	0.0	0.0	0.0	0.0	113	13	300
Solar PSF Pama	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.6	0.2	0.1	0.0	0.0	0.0	2	1	9
Solar PSF Lomas Coloradas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0	0	9
Solar Las Terrazas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6	1.4	2.1	2.6	2.8	2.8	2.8	2.8	2.5	1.9	1.1	0.3	0.0	0.0	0.0	0.0	24	3	21
Solar PV Salvador	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.7	42.6	41.6	40.0	40.0	37.9	38.0	36.6	33.4	31.0	31.0	40.6	33.3	2.9	0.0	0.0	0.0	458	43	649
Solar Chañares	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	11.3	15.2	15.0	15.7	17.0	17.0	16.5	15.2	15.0	6.1	0.2	7.2	0.6	0.0	0.0	0.0	155	17	319
Solar Lalackama	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	21.3	35.4	31.9	31.7	31.6	30.2	29.7	26.4	25.0	24.8	26.2	24.2	3.5	0.0	0.0	0.0	344	35	480
Solar Javiera	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.5	41.6	41.2	39.6	39.0	38.8	37.1	35.3	30.5	30.1	30.1	46.1	30.7	2.1	0.0	0.0	0.0	451	46	644
Solar Loma Los Colorados	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.2	0.1	0.3	0.3	0.5	0.3	0.1	0.0	0.0	0.0	0.0	0.0	3	1	0
Solar Luz del Norte	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.9	89.8	102.8	100.4	101.6	101.1	98.3	96.2	91.5	87.9	84.8	94.9	60.4	5.8	0.0	0.0	0.0	1,138	103	0
Solar Luna	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	1.1	1.6	1.3	2.5	2.8	2.8	2.7	2.2	1.2	0.8	0.3	0.0	0.0	0.0	0.0	20	3	17
Solar Lalackama 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	6.7	10.9	9.8	10.1	10.1	9.7	9.2	8.2	7.7	8.0	8.1	6.9	1.0	0.0	0.0	0.0	107	11	116
Solar El Pilar - Los Amarillos	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.0	1.6	2.1	2.4	2.6	2.5	2.4	2.0	1.4	0.8	0.2	0.0	0.0	0.0	0.0	19	3	0
Solar Sol	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	1.1	1.6	1.3	2.5	2.8	2.8	2.7	2.2	1.2	0.8	0.3	0.0	0.0	0.0	0.0	20	3	17
Solar Lagunilla	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0
Solar Carrera Pinto	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	3.7	7.2	10.2	10.9	10.9	10.9	10.8	10.8	10.8	9.2	6.0	2.4	0.2	0.0	0.0	0.0	105	11	0
Total Generación SIC	**6,203**	**5,585**	**5,260**	**5,216**	**5,235**	**5,315**	**5,421**	**5,571**	**6,145**	**6,656**	**6,942**	**7,124**	**7,221**	**7,211**	**7,291**	**7,255**	**7,198**	**7,080**	**6,834**	**6,600**	**6,581**	**7,034**	**7,021**	**6,669**	**154,670**	**7,291**	**155,052**
Termoeléctrico	**43.4%**	**46.6%**	**50.8%**	**51.0%**	**50.7%**	**50.0%**	**49.2%**	**47.2%**	**43.1%**	**43.3%**	**42.2%**	**42.6%**	**42.0%**	**43.2%**	**43.3%**	**44.1%**	**45.2%**	**45.9%**	**46.8%**	**48.8%**	**50.1%**	**47.1%**	**47.8%**	**50.5%**	**46.2%**		
Hidroeléctrico	**54.9%**	**51.7%**	**48.2%**	**48.6%**	**48.9%**	**49.6%**	**50.5%**	**51.1%**	**51.7%**	**50.8%**	**52.0%**	**51.4%**	**51.7%**	**50.0%**	**50.4%**	**49.7%**	**48.6%**	**48.4%**	**47.1%**	**46.9%**	**48.9%**	**52.4%**	**52.0%**	**49.2%**	**50.2%**		
Solar	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**1.10%**	**4.83%**	**5.51%**	**5.30%**	**5.28%**	**5.32%**	**5.25%**	**5.06%**	**4.78%**	**4.66%**	**4.45%**	**4.77%**	**3.34%**	**0.30%**	**0.00%**	**0.00%**	**0.00%**	**2.69%**		
Eólico	**1.72%**	**1.70%**	**0.95%**	**0.39%**	**0.40%**	**0.35%**	**0.31%**	**0.61%**	**0.38%**	**0.44%**	**0.52%**	**0.64%**	**1.00%**	**1.52%**	**1.22%**	**1.41%**	**1.52%**	**1.27%**	**1.26%**	**1.00%**	**0.74%**	**0.43%**	**0.20%**	**0.37%**	**0.87%**		

ANEXO Nº 3
Detalle del Movimiento de Centrales e Informe de Novedades Relevantes
del CDC correspondientes al día 07 de enero de 2016

	07/01/2016								
	Sincron. de Unidad		POTENCIA (EN MW) SUBE	BAJA	QUEDA	MOTIVO	Etapa de la Central	Condición del Embalse	Condición de la Central
00:00		Pehuenche			240	Unidad 1 Regula frecuencia y ratifica condicion de agotamiento		Normal	(1) E/S Reguladora
00:00		Colbún			300	Ratifica condicion de agotamiento	COLBUN_sinv	Agotamiento	(6) E/S
00:00		Rapel		40	0	por cambio en politica de precios y ratifica condicion de agotamiento		Agotamiento	(8) F/S
00:00		Nehuenco II		120	260	Por control suministro de Gas	NEHUENCO_2_GNL		(5) E/S Min Técnico
00:00		Arauco		10	4	Por cambio en politica de precios	ARAUCO_1		(7) E/S Plena Carga
00:00		Cipreses			100	No ratifica condición de vertimiento.	CIPRESES_sinv	Normal	(7) E/S Plena Carga
00:06		Colbún	100		400	QCR	COLBUN_sinv	Agotamiento	(6) E/S
00:06		Ralco			204	Unidad 2 regula frecuencia	RALCO_sinv	Normal	(1) E/S Reguladora
00:06		Pehuenche		200	280	Deja regulacion de frecuencia		Agotamiento	(6) E/S
00:07		Quintero 1B		70	0	DCR	QUINTERO_CA_1B_GNL		(8) F/S
00:07		San Isidro II		290	370	Sincronizada la TV	SANISIDRO_2_GNL		(6) E/S
00:08		Quintero 1A		120	0	DCR	QUINTERO_CA_1A_GNL		(8) F/S
00:14		Angostura		50	170	Control Cota Angostura	RALCO_sinv	Normal	(7) E/S Plena Carga
00:20		Angostura		50	120	Control Cota Angostura	RALCO_sinv	Normal	(7) E/S Plena Carga
00:29		Colbún	40		440	QCR	COLBUN_sinv	Agotamiento	(7) E/S Plena Carga
00:31		Pangue	50		200	Control Cota Pangue	RALCO_sinv	Normal	(6) E/S
00:34		Pehuenche		30	250	DCR		Agotamiento	(6) E/S
00:39		Angostura		40	80	Control Cota Angostura	RALCO_sinv	Normal	(7) E/S Plena Carga
00:40		Pangue		120	80	Control Cota Pangue	RALCO_sinv	Normal	(6) E/S
00:40		Angostura		33	47	Control Cota Angostura	RALCO_sinv	Normal	(7) E/S Plena Carga
00:43		San Isidro		100	130	Por control Suministro de gas	SANISIDRO_GNL_CA		(5) E/S Min Técnico
01:04		San Isidro		130	0	Control Suministro de gas	SANISIDRO_GNL_CA		(8) F/S
01:07		Colbún		40	400	DCR	COLBUN_sinv	Agotamiento	(7) E/S Plena Carga
01:24		Colbún		100	300	DCR	COLBUN_sinv	Agotamiento	(7) E/S Plena Carga
01:30		Colbún		50	250	DCR	COLBUN_sinv	Agotamiento	(7) E/S Plena Carga
01:44		Pehuenche		100	150	DCR		Agotamiento	(6) E/S
01:47		Colbún		150	100	DCR	COLBUN_sinv	Agotamiento	(7) E/S Plena Carga
01:48		Pehuenche		30	120	DCR		Agotamiento	(6) E/S
02:24		Colbún		100	0	DCR	COLBUN_sinv	Agotamiento	(8) F/S
03:37		Colihues			0	No se solicita por tiempo de partida. Por falla en L. 154kV Tinguiririca - Rancagua - Jahuel 1 y 2 Sector P. Cortes - Rancagua - Jahuel	COLIHUES_HFO		(8) F/S
03:37		Esperanza DS1	1.6		1.6	Por falla en L. 154kV Tinguiririca - Rancagua - Jahuel 1 y 2 Sector P. Cortes - Rancagua - Jahuel			(7) E/S Plena Carga
03:38		Esperanza DS2	1.8		1.8	Por falla en L. 154kV Tinguiririca - Rancagua - Jahuel 1 y 2 Sector P. Cortes - Rancagua - Jahuel			(7) E/S Plena Carga
03:38		Esperanza TG1	18		18	Por falla en L. 154kV Tinguiririca - Rancagua - Jahuel 1 y 2 Sector P. Cortes - Rancagua - Jahuel No ingresa por lfxxxx			(7) E/S Plena Carga
05:42		Colbún	100		100	QCR	COLBUN_sinv	Agotamiento	(5) E/S Min Técnico
05:43		Pehuenche	50		170	QCR		Agotamiento	(6) E/S
05:55		Pehuenche		50	120	DCR		Agotamiento	(6) E/S
06:18		Colbún	50		150	QCR	COLBUN_sinv	Agotamiento	(5) E/S Min Técnico
06:22		Colbún	50		200	QCR	COLBUN_sinv	Agotamiento	(5) E/S Min Técnico
06:25		Colbún	30		230	QCR	COLBUN_sinv	Agotamiento	(5) E/S Min Técnico
07:06		Guacolda 5		90	60	Segun SICF SD000595/2016			(7) E/S Plena Carga
07:37		Pangue	120		200	Control Cota Pangue	RALCO_sinv	Normal	(6) E/S
07:42		Nehuenco II	120		380	QCR - Por control suministro de Gas	NEHUENCO_2_GNL		(5) E/S Min Técnico
08:08		Pehuenche	80		200	QCR		Agotamiento	(6) E/S
08:10	08:55	San Isidro	240		240	QCR - Disponibilidad de gas	SANISIDRO_GNL_CA		(7) E/S Plena Carga
08:12		Pehuenche	50		250	QCR		Agotamiento	(6) E/S
08:16		Pehuenche	20		270	QCR		Agotamiento	(6) E/S
08:24		Colbún	70		300	QCR	COLBUN_sinv	Agotamiento	(6) E/S
08:27		Arauco			10	Queda generendo en isla con SD 366/2016	ARAUCO_1		(7) E/S Plena Carga
08:29		Pehuenche	60		330	QCR		Agotamiento	(6) E/S
08:35						**INICIO Prorrata por Control TX Línea 220 kV San Andrés - Cardones.**			
08:35		**ERNC**			**-20**	**Prorrata por Control TX Línea 220 kV San Andrés - Cardones. 219 MVA a 23 °C con Sol, flujo N>S.**			
08:35		C. PFV Lalackama		3	47	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 219 MVA a 23 °C con Sol, flujo N>S.			
08:35		C. PFV Diego de Almagro		0	9	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 219 MVA a 23 °C con Sol, flujo N>S.			
08:35		C. PFV Chañares		0	15	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 219 MVA a 23 °C con Sol, flujo N>S.			
08:35		C. PFV Javiera		6	47	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 219 MVA a 23 °C con Sol, flujo N>S.			
08:35		C. PFV San Andrés		0	20	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 219 MVA a 23 °C con Sol, flujo N>S.			
08:35		C. PFV Salvador		5	47	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 219 MVA a 23 °C con Sol, flujo N>S.			
08:35		C. PFV Luz del Norte		6	54	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 219 MVA a 23 °C con Sol, flujo N>S.			
08:35		C. PE Taltal		0	9	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 219 MVA a 23 °C con Sol, flujo N>S.			
08:37		Pehuenche	30		360	QCR		Agotamiento	(6) E/S
09:00		DEGAN			25	En Pruebas SD 47924/2015			(3) E/S En Prueba
09:03	09:06	Guacolda 3	60		60	QCR			(5) E/S Min Técnico
09:03		Guacolda 5		60	0	Con SDCF 606/2016 (Realizar reparación al motor del calentador de aire de la caldera)			(8) F/S
09:04		Esperanza DS1		1.6	0	Por falla en L. 154kV Tinguiririca - Rancagua - Jahuel 1 y 2 Sector P. Cortes - Rancagua - Jahuel (a las 9:36 hrs. F/S)			(8) F/S
09:04		Esperanza DS2		1.8	0	Por falla en L. 154kV Tinguiririca - Rancagua - Jahuel 1 y 2 Sector P. Cortes - Rancagua - Jahuel (a las 9:36 hrs. F/S)			(8) F/S
09:06		**ERNC**			**-30**	**Prorrata por Control TX Línea 220 kV San Andrés - Cardones. 213 MVA a 24 °C con Sol, flujo N>S.**			
09:06		C. PFV Lalackama		5	42	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 213 MVA a 24 °C con Sol, flujo N>S.			
09:06		C. PFV Diego de Almagro		0	9	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 213 MVA a 24 °C con Sol, flujo N>S.			
09:06		C. PFV Chañares		0	15	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 213 MVA a 24 °C con Sol, flujo N>S.			
09:06		C. PFV Javiera		8	39	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 213 MVA a 24 °C con Sol, flujo N>S.			
09:06		C. PFV San Andrés		0	20	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 213 MVA a 24 °C con Sol, flujo N>S.			
09:06		C. PFV Salvador		7	40	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 213 MVA a 24 °C con Sol, flujo N>S.			
09:06		C. PFV Luz del Norte		10	44	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 213 MVA a 24 °C con Sol, flujo N>S.			
09:06		C. PE Taltal		0	10	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 213 MVA a 24 °C con Sol, flujo N>S.			
09:16		El Peñón	2		2	En Pruebas SD 300/2016			(3) E/S En Prueba
09:30		Rapel	100		100	QCR		Agotamiento	(6) E/S
09:41		Pehuenche		40	320	DCR		Agotamiento	(6) E/S
09:51		Colbún	20		320	QCR	COLBUN_sinv	Agotamiento	(6) E/S
09:57		Colbún	30		350	QCR	COLBUN_sinv	Agotamiento	(6) E/S

09:59		Pehuenche	40		360	QCR		Agotamiento	(6) E/S
10:00	10:41	Quintero 1B	120		120	QCR - Disponibilidad de gas	QUINTERO_CA_1B_GNL		(7) E/S Plena Carga
10:02		Pangue	50		250	Control Cota Pangue	RALCO_sinv	Normal	(6) E/S
10:08		Angostura	33		80	Control Cota Angostura	RALCO_sinv	Normal	(6) E/S
10:14		Pehuenche	20		380	QCR		Agotamiento	(6) E/S
11:01		Machicura		8	32	Control Cota Machicura	COLBUN_sinv	Normal	(6) E/S
11:01		Pehuenche		50	330	DCR		Agotamiento	(6) E/S
11:00		Guacolda 3	90		150	En Pruebas			(3) E/S En Prueba
11:00		Guacolda 2			150	No baja por tiempo de estabilización de 8 horas			(7) E/S Plena Carga
11:00		Guacolda 1		65	60	Control Tx líneas 220 kV Maitencillo - Punta Colorada			(5) E/S Min Técnico
11:27		Rapel	50		130	QCR		Agotamiento	(6) E/S
11:29		Angostura	40		120	Control Cota Angostura	RALCO_sinv	Normal	(6) E/S
11:30		Pehuenche	20		350	Control Cota		Agotamiento	(6) E/S
11:38		**ERNC**			**10**	**Prorrata por Control TX Línea 220 kV San Andrés - Cardones. 219 MVA a 23 °C con Sol, flujo N>S.**			
11:38		C. PFV Lalackama		0	42	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 219 MVA a 23 °C con Sol, flujo N>S.			
11:38		C. PFV Diego de Almagro	4		13	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 219 MVA a 23 °C con Sol, flujo N>S.			
11:38		C. PFV Chañares	2		17	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 219 MVA a 23 °C con Sol, flujo N>S.			
11:38		C. PFV Javiera		0	39	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 219 MVA a 23 °C con Sol, flujo N>S.			
11:38		C. PFV San Andrés	4		24	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 219 MVA a 23 °C con Sol, flujo N>S.			
11:38		C. PFV Salvador		0	40	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 219 MVA a 23 °C con Sol, flujo N>S.			
11:38		C. PFV Luz del Norte		0	44	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 219 MVA a 23 °C con Sol, flujo N>S.			
11:38		C. PE Taltal		0	0	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 219 MVA a 23 °C con Sol, flujo N>S.			
11:41		**ERNC**			**-10**	**Prorrata por Control TX Línea 220 kV San Andrés - Cardones. 208 MVA a 25 °C con Sol, flujo N>S.**			
11:41		C. PFV Lalackama		2	40	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 208 MVA a 25 °C con Sol, flujo N>S.			
11:41		C. PFV Diego de Almagro		0	13	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 208 MVA a 25 °C con Sol, flujo N>S.			
11:41		C. PFV Chañares		0	17	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 208 MVA a 25 °C con Sol, flujo N>S.			
11:41		C. PFV Javiera		2	37	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 208 MVA a 25 °C con Sol, flujo N>S.			
11:41		C. PFV San Andrés		0	24	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 208 MVA a 25 °C con Sol, flujo N>S.			
11:41		C. PFV Salvador		2	38	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 208 MVA a 25 °C con Sol, flujo N>S.			
11:41		C. PFV Luz del Norte		3	41	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 208 MVA a 25 °C con Sol, flujo N>S.			
11:41		C. PE Taltal		0	0	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 208 MVA a 25 °C con Sol, flujo N>S.			
11:52		Pehuenche	30		380	QCR		Agotamiento	(6) E/S
12:10		El Peñón		2	0	En Pruebas SD 300/2016			(8) F/S
12:22		Maule	2		2	En Pruebas SD47634/2015			(3) E/S En Prueba
12:45		Arauco	16		20	QCR	ARAUCO_2		(7) E/S Plena Carga
12:45		Cementos BioBio	13		13	QCR	CEMENTOS_BIOBIO_FO6		(7) E/S Plena Carga
12:45		Machicura			32	No sube por IL 00014/2016	COLBUN_sinv	Normal	(6) E/S
12:45		Valdivia	23		61	QCR	VALDIVIA_4_PINO		(7) E/S Plena Carga
12:45		Arauco	4		24	QCR	ARAUCO_3		(7) E/S Plena Carga
12:45	15:30	Los Vientos TG	120		120	QCR	LOSVIENTOS_TG_CNAVIA		(7) E/S Plena Carga
12:45	13:18	Trapén	80		80	QCR			(7) E/S Plena Carga
13:06	13:23	Quintero 1A	120		120	QCR	QUINTERO_CA_1A_GNL		(7) E/S Plena Carga
13:06		Trapén		60	20	DCR			(5) E/S Min Técnico
13:06		Pehuenche		50	330	DCR		Agotamiento	(6) E/S
13:06		Angostura	20		140	Control Cota Angostura	RALCO_sinv	Normal	(6) E/S
13:29		Pehuenche		30	300	DCR		Agotamiento	(6) E/S
13:33		Rapel		30	100	DCR		Agotamiento	(6) E/S
13:38		Pehuenche		40	260	DCR		Agotamiento	(6) E/S
13:54		Pehuenche	40		300	QCR		Agotamiento	(6) E/S
14:00		Rapel		20	80	DCR		Agotamiento	(6) E/S
14:09		Pangue	50		300	Control Cota Pangue	RALCO_sinv	Normal	(6) E/S
14:09		Rapel	70		150	QCR		Agotamiento	(6) E/S
14:12		Pehuenche		60	240	DCR		Agotamiento	(6) E/S
14:25		**ERNC**			**-15**	**Prorrata por Control TX Línea 220 kV San Andrés - Cardones. 180 MVA a 29 °C con Sol, flujo N>S.**			
14:25		C. PFV Lalackama		2	38	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 180 MVA a 29 °C con Sol, flujo N>S.			
14:25		C. PFV Diego de Almagro		0	13	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 180 MVA a 29 °C con Sol, flujo N>S.			
14:25		C. PFV Chañares		1	16	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 180 MVA a 29 °C con Sol, flujo N>S.			
14:25		C. PFV Javiera		4	33	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 180 MVA a 29 °C con Sol, flujo N>S.			
14:25		C. PFV San Andrés		1	23	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 180 MVA a 29 °C con Sol, flujo N>S.			
14:25		C. PFV Salvador		3	35	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 180 MVA a 29 °C con Sol, flujo N>S.			
14:25		C. PFV Luz del Norte		4	37	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 180 MVA a 29 °C con Sol, flujo N>S.			
15:07		**ERNC**				**Redistribución de Potencia Cancelación SD354/2016 -40 MW**			
15:07		C. PFV Lalackama		7	33	Redistribución de Potencia Cancelación SD354/2016 -40 MW			
15:07		C. PFV Diego de Almagro		1	12	Redistribución de Potencia Cancelación SD354/2016 -40 MW			
15:07		C. PFV Chañares		2	15	Redistribución de Potencia Cancelación SD354/2016 -40 MW			
15:07		C. PFV Javiera		7	30	Redistribución de Potencia Cancelación SD354/2016 -40 MW			
15:07		C. PFV San Andrés		2	22	Redistribución de Potencia Cancelación SD354/2016 -40 MW			
15:07		C. PFV Salvador		7	31	Redistribución de Potencia Cancelación SD354/2016 -40 MW			
15:07		C. PFV Luz del Norte		9	32	Redistribución de Potencia Cancelación SD354/2016 -40 MW			
15:07		C. PE Taltal	36		36	Redistribución de Potencia Cancelación SD354/2016 -40 MW			
15:16		Pehuenche	20		260	QCR		Agotamiento	(6) E/S
15:24		Trapén	40		60	QCR			(7) E/S Plena Carga
15:38		Rapel		70	80	DCR		Agotamiento	(6) E/S
15:43		Trapén		60	0	DCR			(8) F/S
15:48		Pehuenche		20	240	DCR		Agotamiento	(6) E/S
16:11		Pehuenche		60	180	DCR		Agotamiento	(6) E/S
16:28		Rapel		40	40	DCR		Agotamiento	(6) E/S
16:47		Pehuenche	60		240	QCR		Agotamiento	(6) E/S

17:06		Angostura	60		200	Control Cota Angostura	RALCO_sinv	Normal	(6) E/S
17:17		Pehuenche		60	180	DCR		Agotamiento	(6) E/S
17:21		Pehuenche		60	120	DCR		Agotamiento	(5) E/S Min Técnico
17:26		Rapel		40	0	DCR		Agotamiento	(8) F/S
17:43		El Toro	20		250	Por requerimiento de DOH	ELTORO_sinv	Normal	(6) E/S
17:53		Los Vientos TG		120	0	DCR	LOSVIENTOS_TG_CNAVIA		(8) F/S
17:53		Cementos BioBio		13	0	DCR	CEMENTOS_BIOBIO_FO6		(8) F/S
17:53		Arauco		14	10	DCR	ARAUCO_1		(7) E/S Plena Carga
17:53		Valdivia		23	38	DCR	VALDIVIA_3_PINO		(7) E/S Plena Carga
18:00		Colbún		110	240	DCR	COLBUN_sinv	Agotamiento	(6) E/S
18:05		**ERNC**			**23**	**Prorrata por Control TX Línea 220 kV San Andrés - Cardones. 194 MVA a 27 °C con Sol, flujo N>S.**			
18:05		C. PFV Lalackama	3		36	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 194 MVA a 27 °C con Sol, flujo N>S.			
18:05		C. PFV Diego de Almagro	3		15	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 194 MVA a 27 °C con Sol, flujo N>S.			
18:05		C. PFV Chañares	3		18	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 194 MVA a 27 °C con Sol, flujo N>S.			
18:05		C. PFV Javiera	3		33	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 194 MVA a 27 °C con Sol, flujo N>S.			
18:05		C. PFV San Andrés	2		24	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 194 MVA a 27 °C con Sol, flujo N>S.			
18:05		C. PFV Salvador	3		34	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 194 MVA a 27 °C con Sol, flujo N>S.			
18:05		C. PFV Luz del Norte	3		35	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 194 MVA a 27 °C con Sol, flujo N>S.			
18:05		C. PE Taltal	3		39	Prorrata por Control TX Línea 220 kV San Andrés - Cardones, 194 MVA a 27 °C con Sol, flujo N>S.			
18:08		Colbún		60	180	DCR	COLBUN_sinv	Agotamiento	(6) E/S
18:12		Guacolda 1	20		80	Control Tx líneas 220 kV Maitencillo - Punta Colorada			(6) E/S
18:14		Arauco			10	Sincroniza al sistema	ARAUCO_1		(7) E/S Plena Carga
18:23		Colbún		40	140	DCR	COLBUN_sinv	Agotamiento	(6) E/S
18:09						**FIN DE PRORRATA por Control Tx de Línea 220 kV San Andrés - Cardones**			
18:28		Colbún		40	100	DCR	COLBUN_sinv	Agotamiento	(5) E/S Min Técnico
18:39		Pangue		100	200	Control Cota Pangue	RALCO_sinv	Normal	(6) E/S
18:53		Guacolda 1	25		125	Control Tx líneas 220 kV Maitencillo - Punta Colorada Limitada según Il 374/2015			(10) E/S con limitación
19:05		**Angostura**		40	**160**	**Control Cota Angostura**	RALCO_sinv	Normal	(6) E/S
19:13		Angostura		40	120	Control Cota Angostura	RALCO_sinv	Normal	(6) E/S
19:20		Pangue	100		300	Control Cota Pangue	RALCO_sinv	Normal	(6) E/S
19:27		Guacolda 5	150		150	Sincroniza al sistema			(7) E/S Plena Carga
19:34		Angostura	20		140	Control Cota Angostura	RALCO_sinv	Normal	(6) E/S
19:34		Pehuenche	30		150	QCR		Agotamiento	(6) E/S
20:16		Pehuenche			180	U2 toma la regulación de frecuencia.		Agotamiento	(1) E/S Reguladora
20:16		Ralco			365	Deja regulacion de frecuencia	**RALCO_sinv**	**Normal**	(7) E/S Plena Carga
21:03		Colbún	100		200	QCR Se solicita segunda unidad	COLBUN_sinv	Agotamiento	(6) E/S
21:05	21:06	Rapel	80		80	QCR		Agotamiento	(6) E/S
21:27		Colbún	80		280	QCR	COLBUN_sinv	Agotamiento	(6) E/S
22:25		Colbún		80	200	DCR	COLBUN_sinv	Agotamiento	(6) E/S
22:46		Ralco		60	300	Control Cota según IL 304/2007	RALCO_sinv	Normal	(6) E/S
23:01		Colbún	30		230	QCR	COLBUN_sinv	Agotamiento	(7) E/S Plena Carga
23:01		Ralco		40	260	Control Cota según IL 304/2007	RALCO_sinv	Normal	(6) E/S
23:02		Pangue		100	200	Control Cota Pangue	RALCO_sinv	Normal	(6) E/S
23:29		Pangue		100	100	Control Cota Pangue	RALCO_sinv	Normal	(6) E/S
23:43		Pangue		50	50	Control Cota Pangue	RALCO_sinv	Normal	(6) E/S
23:50		Colbún		70	160	DCR	COLBUN_sinv	Agotamiento	(7) E/S Plena Carga
23:57		Colbún		60	100	DCR	COLBUN_sinv	Agotamiento	(7) E/S Plena Carga

CDEC SIC

INFORME DE NOVEDADES CDC
Jueves 07 de Enero de 2016

1. RESUMEN EJECUTIVO

RESUMEN DIARIO OPERACIÓN SIC

jueves, 07 de enero de 2016

Generación por fuente

	Diario (GWh)			Acumulado Anual (TWh)		
	jue 07/ene	mié 06/ene	var%	2016	2015	var%
Térmico	71.1	63.9	+ 11.3%	0.4	0.5	- 16.8%
Hidráulico	77.5	85.1	- 9.0%	0.5	0.5	+ 19.8%
Eólico	1.3	2.1	- 36.4%	0.0	0.0	- 17.4%
Solar	4.0	4.0	- 0.3%	0.0	0.0	+ 75.5%
Total	**153.8**	**155.1**	**- 0.8%**	**1.0**	**1.0**	**+ 1.9%**

Reducción energía Eólica y Solar

	Diario (MWh)			Acumulado Anual (GWh)		
	jue 07/ene	mié 06/ene	var%	2016	2015	var%
Total	**521.3**	**803.3**	**- 35.1%**	**5.1**	**0.0**	**-**

Generación Térmica

	Diario (GWh)			Acumulado Anual (TWh)		
	jue 07/ene	mié 06/ene	var%	2016	2015	var%
Diésel	0.39	1.52	- 74.3%	0.0	0.0	- 40.7%
Carbón	41.34	40.79	+ 1.4%	0.3	0.3	+ 4.9%
Biomasa	5.57	5.75	- 3.2%	0.0	0.0	- 4.5%
Biogas	0.25	0.35	- 27.6%	0.0	0.0	- 32.5%
GN	23.52	15.44	+ 52.3%	0.1	0.2	- 56.0%
Otros	0.00	0.00	-	0.0	0.0	- 84.0%
Total	**71.1**	**63.9**	**+ 11.3%**	**0.4**	**0.5**	**- 16.8%**

Generación Hidráulica

	Diario (GWh)			Acumulado Anual (TWh)		
	jue 07/ene	mié 06/ene	var%	2016	2015	var%
Embalse	36.7	42.3	- 13.3%	0.25	0.21	+ 16.5%
Pasada	40.8	42.8	- 4.7%	0.30	0.24	+ 22.6%
Total	**77.5**	**85.1**	**- 9.0%**	**0.5**	**0.5**	**+ 19.8%**

Generación Renovable No Convencional

	Diario (GWh)			Acumulado Anual (TWh)		
	jue 07/ene	mié 06/ene	var%	2016	2015	var%
Minihidro	3.3	3.4	- 0.4%	0.02	0.02	+ 4.7%
Eólica	1.3	2.1	- 36.4%	0.02	0.02	- 17.4%
Solar	4.0	4.0	- 0.3%	0.03	0.02	+ 75.5%
Biomasa	3.6	3.6	- 1.0%	0.02	0.03	- 32.6%
Biogas	0.3	0.3	- 27.6%	0.00	0.01	- 32.5%
Total	**12.5**	**13.4**	**- 6.9%**	**0.10**	**0.10**	**- 3.2%**

Cotas (msnm)

	Diario		Máxima	Mín. Operacional
	jue 07/ene	mié 06/ene	2016	2016
Chapo	231.35	231.49	243.00	220.00
Invernada	1317.97	1318.04	1319.00	1280.00
Laja	1324.89	1324.94	1369.00	1308.48
Colbún	432.58	432.73	437.00	397.00
Rapel	104.01	104.02	104.75	97.00
Ralco	709.97	710.37	725.00	692.00
Melado	641.08	641.03	648.00	639.50
Pangue	507.25	507.44	510.50	501.00

Precipitaciones (mm)

	Diario		Acumulado Anual		
	jue 07/ene	mié 06/ene	2016	var% 2015	var% Año Normal
Rapel	0.0	0.0	0.0	-	-
Invernada	0.0	0.0	0.0	-	- 100.0%
Melado	0.0	0.0	0.0	-	- 100.0%
Colbún	0.0	0.0	0.0	-	- 100.0%
Laja	0.0	0.0	0.0	-	- 100.0%
Pangue	0.0	0.0	0.0	-	- 100.0%
Chapo	0.0	0.0	0.0	- 100.0%	- 100.0%

Costos Marginales Promedios Programados (USD/MWh)

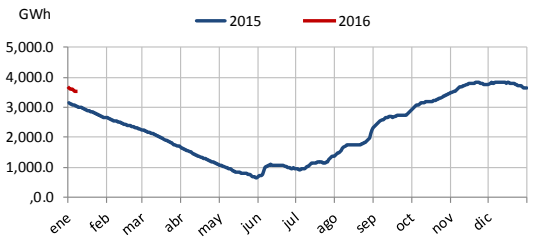
	Diario			Promedio Anual		
	jue 07/ene	mié 06/ene	var%	2016	2015	var%
Maitencillo	58.2	51.6	+ 13%	46.7	116.5	- 59.9%
Quillota	66.1	51.6	+ 28%	48.5	121.2	- 60.0%
Charrúa	66.1	51.6	+ 28%	48.3	121.2	- 60.2%
Promedio	**63.4**	**51.6**	**+ 23%**	**47.8**	**119.7**	**- 60.0%**

Demanda Máxima (MW) y Generación (GWh)

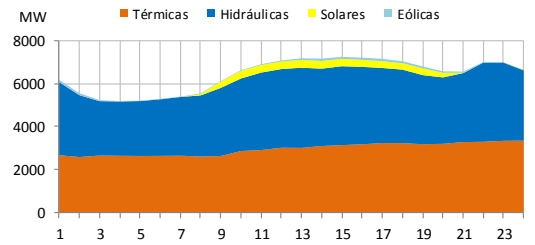
	Diario			Máximo Anual		
	jue 07/ene	mié 06/ene	var%	2016	2015	var%
Máxima Horaria	7243	7348	- 1.4%	7348	7365	- 0.2%

	Programado	Hora	Real	Hora	var%
Demanda Máx.	7337	17	7243	15	- 1.3%
Demanda Punta	-	-	-	-	No aplica
Generación Total	155.1	-	153.8	-	- 0.8%

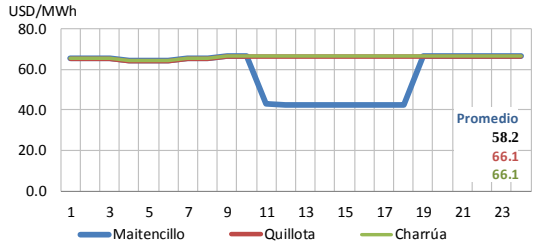
Energía Embalsada en los Últimos 12 Meses (GWh)



Generación horaria bruta por tecnología (MW/h)



Costos Marginales horarios programados (USD/MWh)



(*) Representa el acumulado a igual fecha 2016 y 2015

Fecha reporte: viernes, 08 de enero de 2016

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2. DESVIACIONES DE LA PROGRAMACIÓN

CENTRALES	Prog.	Real	Desv %	Estado	CENTRALES	Prog.	Real	Desv %	Estado
Abanico	840,0	859,0	2,26		Los Hierros	96,0	67,6	-29,63	
Alfalfal	3648,0	3356,5	-7,99		Los Hierros 2	24,0	0,0	-100,00	
Allipén	59,0	34,3	-41,86	PMGD	Los Molles	192,0	188,0	-2,08	
Alto Renaico	0,0	0,0	0,00		Los Morros	67,0	72,1	7,61	PMGD
Andes	0,0	0,0	0,00		Los Padres	0,0	1,8		PMGD
Angostura	2670,0	2637,0	-1,24		Los Pinos	0,0	0,0	0,00	
Antilhue TG	0,0	0,0	0,00		Los Quilos	816,0	845,9	3,66	
Antuco	3888,0	3897,0	0,23		Los Vientos	0,0	265,8	GNP	
Arauco	240,0	190,4	-20,67		Machicura	1568,0	930,0	-40,69	IL
Auxiliar del Maipo	84,0	0,0	-100,00	PMGD	Maisan	0,0	4,6		PMGD
Biogás Ancali	0,0	0,0		PMGD	Maitenes	300,0	296,0	-1,33	
Blanco	1310,0	1284,4	-1,95		Mallarauco	72,0	80,5	11,81	PMGD
Bocamina	0,0	0,0	0,00	SDCF	Mampil	260,0	272,8	4,91	
Bocamina II	0,0	0,0	0,00	SDCF	María Elena	0,0	1,8		PMGD
Callao	0,0	6,2			Mariposas	72,0	78,1	8,47	
Calle Calle	0,0	0,0	0,00		Masisa	120,0	189,2	57,67	
Campiche	6528,0	6529,0	0,02		Monte Patria+Punitaqui	0,0	0,0		PMGD
Candelaria 1 GN	0,0	0,0	0,00		Muchi	0,0	0,2		PMGD
Candelaria 1 GNL	0,0	0,0	0,00		Nalcas	24,0	23,6	-1,50	
Candelaria 1 Diésel	0,0	0,0	0,00		Nehuenco 9B DIE	0,0	0,0	0,00	
Candelaria 2 GN	0,0	0,0	0,00		Nehuenco 9B GAS	0,0	0,0	0,00	
Candelaria 2 GNL	0,0	0,0	0,00		Nehuenco Diésel	0,0	0,0	0,00	
Candelaria 2 Diésel	0,0	0,0	0,00		Nehuenco Gas	0,0	0,0	0,00	
Canutillar	3840,0	3745,0	-2,47		Nehuenco II	0,0	0,0	0,00	
Capullo	119,0	108,7	-8,66		Nehuenco II Diésel	0,0	0,0	0,00	
Cardones	0,0	0,0	0,00		Nehuenco II GNL	7840,0	7904,0	0,82	
Carena	232,0	163,5	-29,53		Newen	0,0	0,0	0,00	
Celco	120,0	122,6	2,17		Nueva Aldea 1	360,0	260,6	-27,61	
Cementos Bío Bío	0,0	20,1	GNP		Nueva Aldea 2	0,0	0,0	0,00	IF
Cenizas	0,0	0,0	0,00	IF	Nueva Aldea 3	888,0	799,2	-10,00	
Chacabuquito	0,0	0,0	0,00	IF	Nueva Renca Diésel	0,0	0,0	0,00	
Chacayes	2640,0	2506,4	-5,06		Nueva Renca GNL	0,0	0,0	0,00	PMM
Chiburgo	450,0	417,0	-7,33		Nueva Ventanas	6000,0	5949,0	-0,85	IL
Chiloé	0,0	0,0	0,00		Ojos de Agua	120,0	200,7	67,25	
Cholguán	216,0	194,0	-10,19		Olivos	0,0	0,0	0,00	
Chuyaca	0,0	0,0	0,00		P. Valdivia	912,0	647,4	-29,01	
Cipreses	2232,0	2212,0	-0,90		Palmucho	744,0	672,0	-9,68	
CMPC Cordillera	0,0	507,2	GNP		Pangue	4570,0	4728,0	3,46	
CMPC Laja	360,0	1,8	-99,50	IL	Pehuenche	6816,0	5493,0	(*) -19,41	
CMPC Pacifico	552,0	584,8	5,94		Pehui	0,0	4,0		PMGD
CMPC Santa Fe	120,0	246,2	105,17		Petropower	1560,0	1277,0	-18,14	
Colbún	5680,0	5559,0	-2,13		Peuchén	344,0	435,0	26,46	
Colihues_DIE	0,0	0,0	0,00		Pichilonco	24,0	0,0	-100,00	PMGD
Colihues_IFO	0,0	0,0	0,00		Picoiquén	72,0	80,2	11,39	
Colmito GNL	0,0	0,0	0,00		Pilmaiquén	480,0	490,8	2,25	PMM
Colmito Diésel	0,0	0,0	0,00		Pulelfu	0,0	78,5	GNP	
Concón	0,0	0,0	0,00		Providencia	24,0	16,8	-30,00	
Const. Elektr.+Maule	0,0	1,9	GNP	IF	Puclaro	24,0	24,0	-0,17	PMGD
Coronel TG Diésel+Gas	0,0	0,0	0,00		Pullinque	450,0	453,3	0,73	
Coya	288,0	278,8	-3,19		Punta Colorada	0,0	0,0	0,00	
Curauma y Casablanca	0,0	1,2		PMGD	Puntilla	290,0	393,8	35,79	

CENTRALES	Prog.	Real	Desv %	Estado	CENTRALES	Prog.	Real	Desv %	Estado
Curillinque	2016,0	1998,0	-0,89		Purísima	0,0	9,9		PMGD
Degañ	0,0	0,0	0,00	IL	Quellón 2	0,0	0,0	0,00	
Diego de Almagro	0,0	0,0	0,00		Queltehues	971,0	971,0	0,00	
Don Walterio	48,0	37,5	-21,83	PMGD	Quillaileo	5,0	3,2	-35,80	PMGD
Dongo	0,0	0,0		PMGD	Quilleco	646,0	678,0	4,95	
El Canelo	23,0	43,5	89,13	PMGD	Quintero Diésel	0,0	0,0	0,00	IL
El Diuto	72,0	71,9	-0,14	PMGD	Quintero GNL	0,0	2811,0	(*) GNP	
El Llano	24,0	30,6	27,50	PMGD	Ralco	7695,0	7168,0	-6,85	PMM
El Manzano	72,0	77,6	7,78	PMGD	Rapel	2095,0	1090,0	(*) -47,97	
El Paso	0,0	733,5	GNP		Reca	0,0	7,6		PMGD
El Peñón	0,0	1,3	GNP		Renaico	144,0	138,7	-3,68	
El Salvador	0,0	0,0	0,00		Renca	0,0	0,0	0,00	
El Tártaro	0,0	0,0		PMGD	Rincón	0,0	7,2	GNP	
El Toro	5043,0	5778,0	14,57		Río Huasco	24,0	31,2	30,00	
El Totoral+Quintay+Placilla	0,0	1,7	GNP	IF	Roblería	69,0	58,5	-15,22	PMGD
Emelda (I + II)	0,0	0,0	0,00		Rucatayo	480,0	521,0	8,53	
Energía León	0,0	0,0		PMGD	Rucúe	1486,0	1638,0	10,23	
Energía Pacífico	0,0	0,0	0,00	SDCF	San Andrés	865,0	849,2	-1,83	
Enor Esperanza(DS +TG)	0,0	15,2	GNP		San Clemente	116,0	120,0	3,45	
Ensenada	0,0	0,0		PMGD	San Gregorio	0,0	0,0	0,00	
Eólica Canela	150,0	34,4	-77,07		San Ignacio	526,0	242,0	-53,99	
Eólica El Arrayán	115,0	57,4	-50,09		San Isidro Diésel	0,0	0,0	0,00	IL
Eólica Lebu	93,0	9,4	-89,89	PMG	San Isidro Gas	0,0	0,0	0,00	
Eólica Los Cururos	279,0	83,9	-69,93		San Isidro GNL	910,0	3743,0	(*) 311,32	PMM
Eólica Monte Redondo	110,0	51,3	-53,36		San Isidro 2 Diésel	0,0	0,0	0,00	
Eólica Cuel	128,0	112,5	-12,11		San Isidro 2 Gas	0,0	0,0	0,00	
Eólica Punta Colorada	112,0	107,5	-4,02		San Isidro 2 GNL	9120,0	8555,0	-6,20	
Eólica Punta Palmeras	74,0	57,9	-21,76		San Lorenzo	0,0	0,0	0,00	
Eólica Raki	0,0	0,0		PMGD	Santa Fe Energía	0,0	0,0	0,00	PMM
Eólica San Pedro	263,0	80,5	-69,39		Santa Lidia	0,0	0,0	0,00	
Eólica Talinay	222,0	97,6	-56,04		Santa María	8520,0	8493,0	-0,32	IL
Eólica Talinay Pte.	240,0	137,6	-42,67		Santa Marta	264,0	251,0	-4,92	
Eólica Taltal	609,0	405,0	-33,50		Sauce Andes	19,0	24,4	28,21	PMGD
Eólica Totoral	85,0	42,8	-49,65		Sauzal	1713,0	1686,0	-1,58	
Eólica Ucuquer	26,0	25,8	-0,62	PMGD	Sauzal 60	0,0	0,0	0,00	
Eólica Ucuquer 2	28,0	35,3	26,14		Sauzalito	283,0	225,0	-20,49	
Escuadrón (Ex FPC)	288,0	231,1	-19,76		Solar Carrera Pinto	0,0	0,0	0,00	
Espinos	0,0	0,0	0,00		Solar Chañares	319,0	154,5	-51,57	
Estancilla	0,0	0,0		PMGD	Solar Lalackama	480,0	343,7	-28,40	
Eyzaguirre	24,0	28,8	20,00	PMGD	Solar Lalackama 2	116,0	107,1	-7,67	
Florida	419,0	463,0	10,50		Solar Diego de Almagro	300,0	113,4	-62,20	IL
Gorbea	0,0	3,3		PMGD	Solar El Pilar-Los Amarillos	0,0	0,0		PMGD
Guacolda 1	2520,0	2631,9	4,44	IL	Solar Esperanza	17,0	0,0	-100,00	PMGD
Guacolda 2	3648,0	3592,0	-1,54	IL	Solar Lagunilla	0,0	0,0		PMGD
Guacolda 3	1918,0	1980,0	3,23	SDCF	Solar Las Terrazas	21,0	23,7	12,81	PMGD
Guacolda 4	3304,0	3646,0	10,35	IL	Solar Llano de Llampos	720,0	932,2	29,47	
Guacolda 5	3648,0	1622,6	(*) -55,52	SDCF	Solar Lomas Colorada	9,0	0,2	-98,00	PMGD
Guayacán	303,0	295,1	-2,61		Solar Loma Los Colorados	0,0	0,0	0,00	
Hidrico Collil	1,0	3,3	230,00	PMGD	Solar Luna	17,0	0,0	-100,00	PMGD
Hidrobonito mc1	48,0	51,1	6,35	PMGD	Solar Luz del Norte	0,0	1138,4	(*) GNP	
Hidrobonito mc2	24,0	14,4	-39,88	PMGD	Solar Pama	9,0	1,7	-81,56	PMGD
H. Laja	0,0	0,0	0,00		Solar Javiera	644,0	450,7	-30,02	
Horcones TG GN	0,0	0,0	0,00	PMM	Solar PV. Salvador	649,0	457,6	-29,49	
Horcones TG Diésel	0,0	0,0	0,00		Solar San Andrés	435,0	250,4	-42,44	IL

CENTRALES	Prog.	Real	Desv %	Estado	CENTRALES	Prog.	Real	Desv %	Estado
Hornitos	1312,0	1233,7	-5,97		**Solar Santa Cecilia (ex Avenir)**	15,0	0,0	-100,00	PMGD
Huasco TG	0,0	0,0	0,00		**Solar SDGx01 (Andacollo)**	4,0	6,5	61,75	
Isla	1608,0	1573,0	-2,18		**Solar Sol**	17,0	0,0	-100,00	
Itata	0,0	5,3	GNP		**Solar Tambo Real**	3,0	0,0	-100,00	PMGD
Juncal	588,0	634,5	7,91		**Solar Techos Altamira**	0,0	0,5		PMGD
Juncalito	24,0	21,7	-9,58	PMGD	**Taltal 1 Diésel**	0,0	0,0	0,00	
La Arena	0,0	0,0		PMGD	**Taltal 1GNL**	0,0	0,0	0,00	
La Confluencia	1968,0	1931,4	-1,86	IF	**Taltal 2 Diésel**	0,0	0,0	0,00	
La Higuera	2040,0	2091,1	2,50	PMM	**Taltal 2 GNL**	0,0	0,0	0,00	
La Paloma	0,0	0,0		PMGD	**Teno**	0,0	0,0	0,00	
Laguna Verde TG	0,0	0,0	0,00	IF	**Termopacífico**	0,0	0,0	0,00	
Laguna Verde TV	0,0	0,0	0,00		**Tissue**	0,0	0,0	0,00	
Laja Energía Verde	216,0	150,0	-30,56		**Trailelfú**	0,0	7,3		PMGD
Las Flores	24,0	21,0	-12,50	PMGD	**Trapén**	0,0	84,5	GNP	
Las Vegas	0,0	0,0	0,00		**Trebal**	0,0	0,0		PMGD
Las Vertientes	0,0	0,0		PMGD	**Trueno**	17,0	17,8	4,71	PMGD
Lautaro 1	624,0	622,6	-0,22	IL	**Truful-Truful**	4,0	17,4	335,25	PMGD
Lautaro 2	528,0	484,2	-8,30		**Ventanas 1**	2520,0	2109,0	-16,31	IL
Licán	102,0	99,8	-2,16		**Ventanas 2**	3600,0	3515,0	-2,36	IL
Licantén	144,0	107,8	-25,14		**Viñales**	528,0	733,6	38,94	
Linares Norte	0,0	0,0	0,00		**Volcán**	307,0	307,0	0,00	
Lircay	480,0	483,3	0,69		**Yungay 1 Diésel**	0,0	0,0	0,00	
Llauquereo	24,0	0,4	-98,33		**Yungay 1 Gas**	0,0	0,0	0,00	
Loma Alta	888,0	879,0	-1,01		**Yungay 2 Diésel**	0,0	0,0	0,00	
Loma Los Colorados 1	24,0	0,0	-100,00	IF	**Yungay 2 Gas**	0,0	0,0	0,00	
Loma Los Colorados 2	384,0	0,0	-100,00		**Yungay 3 Diésel**	0,0	0,0	0,00	
Los Bajos	120,0	0,0	-100,00	PMGD	**Yungay 3 Gas**	0,0	0,0	0,00	
Los Corrales I	23,0	17,3	-53,75	PMGD	**Yungay 4 Diésel**	0,0	0,0	0,00	
Los Corrales II	24,0	16,8	-30,00	PMGD	**Otra Generación**	-17,0	0,0	-100,00	PMGD
Los Guindos	0,0	0,0	0,00	IL					

Otra Generación: Centrales Los Sauces, Malleco, Victoria, Chufquén, Curacautín, Pelohuén, Valdivia SGA, Skretting, Las Pampas, Santa Irene, Tamm, Planta Curicó, Lonquimay, Biomar, Lebu, Cañete, Eagon, Lousiana Pacific, Multiexport, Polincay, Salmofood, Tapihue, Trongol, Watts, Contulmo, HBS, Tomaval, Tirúa, Biocruz.

Abreviaturas:

GNP: Generación no programada.
PMM: Programa de Mantenimiento Mayor.
IF: Indisponibilidad por Falla.
SDCF: Solicitud de desconexión de curso forzoso.
PMGD: Pequeño Medio de Generación Distribuido.
PMMep: Programa de Mantenimiento Mayor con extensión de plazo.
IL: Informe de Limitación de Unidades Generadoras.
S/I: Sin información.

(*) JUSTIFICACIÓN DE PRINCIPALES DESVIACIONES.

C. Guacolda 5	Menor generación real por solicitud de desconexión de curso forzoso.
C. Pehuenche	Menor generación real por condición de agotamiento.
C. Quintero	GNP por costo marginal.
C. Rapel	Menor generación real por condición de agotamiento.
C. San Isidro	Mayor generación real por costo marginal.
C. Luz del Norte	GNP en pruebas.

$$(*)\ \text{si}\ \begin{cases} \left|E_{real} - E_{programada}\right| > 12.5\%\ E_{programada} \\ \text{y} \\ \left|E_{real} - E_{programada}\right| > 0.5\%\ E_{total\ real} \end{cases}$$

3. ESTADO DE LAS CENTRALES

Estado	CENTRALES (≥100 MW)	Disponibilidad (%)
Indisponibilidad por Falla	La Confluencia	50
Programa de Mantenimiento Mayor	Nueva Renca	0
	Ralco U-1	0
	San Isidro TV	0
	La Higuera	50
Informe de Limitación de Unidad Generadora	Guacolda 1	83
	Guacolda 2	100
	Guacolda 4	100
	Nueva Ventanas	92
	Santa María	95
	Ventanas 1	79
	Ventanas 2	68
	Quintero Diésel	0
	San Isidro Diésel	0
	Los Guindos	85
Solicitud de desconexión de curso forzoso	Bocamina	0
	Bocamina II	0
	Guacolda 3	0
	Guacolda 5	0

- C. Guacolda unidad 1 limitación asociada por puesta E/S de equipos de abatimiento de emisiones.
- C. Guacolda unidad 1, 2 y 4 limitación asociada por tiempo de estabilización.
- C. Nueva Ventanas limitada a 250 MW sin poder variar su generación por problemas en válvula de vapor sobrecalentado, válvula no abre luego de prueba de cierre.
- C. Ralco con U-2 disponible al 100 %. Limitación asociada a gasto por cota (40 cm diario).
- C. Ventanas 1 limitada por control temperatura de agua de sistema de refrigeración.
- C. Ventanas 2 limitada a carga fija por control de combustión de la caldera.
- C. Los Guindos limitación por alta temperatura en el escape.
- C. Santa María limitación por pérdida de eficiencia de la turbina a vapor.
- C. Bocamina indisponible por desconexión indefinida de las líneas de 220 kV y 154 kV, informada a Endesa por Transelec, según lo dispuesto por la Corte de Apelaciones de Concepción en oficio n°10405 dictado en recurso de protección ROL 10.162-2015.
- C. Bocamina II indisponible por desconexión indefinida de las líneas de 220 kV y 154 kV, informada a Endesa por Transelec, según lo dispuesto por la Corte de Apelaciones de Concepción en oficio n°10405 dictado en recurso de protección ROL 10.162-2015.
- C. Guacolda unidad 3 indisponible por filtración de gases en la compuerta de inspección de la chimenea.
- C. Guacolda unidad 5 indisponible por falla en motor de calentador de aire de la caldera.

4. ANTECEDENTES DE LA OPERACIÓN DIARIA

4.1. Observaciones

Hora	Observación
00:00	C. Pehuenche U-1 regula frecuencia.
00:00	Cs. Alto Renaico, PFV Loma Los Colorados, Pulelfu PMG, PFV Luz del Norte, PFV Carrera Pinto, El Paso, CMPC Cordillera, Santa Marta U-9 y 10, Itata, PE Lebu (ampliación de 6,5 a 10 MW), CMPC Tissue y Andes Generación continúan en pruebas.
00:00	C. La Confluencia continúa vertiendo.

Hora	Observación
00:00	Cs. Pehuenche, Colbún y Rapel ratifican condición de agotamiento.
00:06	C. Ralco U-2 toma la regulación de frecuencia.
00:07	C. San Isidro II TV disponible y sincronizada.
00:41	Línea de 66 kV Pan de Azúcar – Marquesa interrupción forzada por protecciones, se pierden 12 MW de consumos.
01:04	C. San Isidro TG se retira por control suministro de gas.
01:08	Línea de 154 kV Tinguiririca – Rancagua – Alto Jahuel 2 interrupción forzada por protecciones, se pierden 77 MW de consumos correspondientes a SS/EE Cachapoal, Machalí, Loreto, Lo Miranda, Tuniche, Quinta de Tilcoco, Las Cabras y El Manzano. Causa informada: Robo de conductor entre estructuras Nº 354 y 355.
01:08	S/E Tinguiririca línea de 154 kV Itahue – Tinguiririca 2 interrupción forzada por protecciones, en S/E Itahue se encontraba abierto por control de oscilaciones.
01:10	C. La Higuera U-1 F/S a solicitud del CDC para eliminar las oscilaciones en línea de 154 kV Tinguiririca – Rancagua – Alto Jahuel 1.
01:12	Cerrada línea de 66 kV Pan de Azúcar – Marquesa y normalizado los consumos.
01:12	S/E Punta de Cortés CC de Transelec abre interruptores de línea de 154 kV Tinguiririca – Rancagua – Alto Jahuel 1 y 2, no autorizado por el CDC. Centrales que inyectan en S/E Tinguiririca quedan generando en isla alimentando los consumos de SS/EE San Fernando y Teno. Por operación de EDAC se pierden 23 y 25 MW de consumos correspondientes a SS/EE San Fernando y Teno, se autoriza la reposición inmediata.
01:12	C. La Confluencia U-1 sale del servicio en forma intempestiva con 77 MW.
01:12	C. El Paso U-2 y U-3 salen del servicio en forma intempestiva con 40 MW.
01:12	S/E Teno Planta Papeles Arauco pierde 1,3 MW de consumos por operación de EDAC.
01:17	S/E Itahue sincronizada línea de 154 kV Itahue – Tinguiririca 1.
01:19	Recuperado los consumos de SS/EE Quinta de Tilcoco, Las Cabras y El Manzano.
01:19	Línea de 154 kV Punta de Cortés – Rancagua – Alto Jahuel 1 interrupción forzada por protecciones, se pierden 87 MW de consumos correspondientes a SS/EE Buin TR Nº 2, Fátima, Hospital, Isla de Maipo, Graneros, San Francisco de Mostazal y Papelera Talagante. Causa informada: Robo de conductor entre estructuras Nº 354 y 355.
01:19	S/E Rancagua alimentado en isla desde S/E Sauzal.
01:21	S/E Teno Planta Papeles Arauco normalizado consumos.
01:21	Recuperado los consumos del TR Nº 2 de S/E Buin.
01:27	S/E Alto Jahuel cierre manual sin éxito de línea de 154 kV Punta de Cortés – Rancagua – Alto Jahuel 1.
01:28	S/E Alto Jahuel cierre manual sin éxito de línea de 154 kV Punta de Cortés – Rancagua – Alto Jahuel 2.
01:32	Cerrada línea de 154 kV Itahue – Tinguiririca 2.
01:36	C. Coya U-5 F/S a solicitud del CDC para transferir su inyección hacia S/E Rancagua para mejorar condiciones de tensión y frecuencia en la zona.
01:43	Línea de 66 kV Rancagua – Rosario se realiza microcorte para transferir consumos desde S/E Rancagua hacia S/E Malloa, para mejorar regulación de frecuencia y voltaje en área de Rancagua alimentada en isla desde C. Sauzal.
01:43	C. Chacayes U-1 sale del servicio en forma intempestiva con 60 MW.
01:50	C. Sauzalito sale del servicio en forma intempestiva con 11.5 MW.
01:51	C. Coya U-5 sincronizada hacia Rancagua.
01:53	C. Coya U-5 F/S a solicitud del CDC para transferir su inyección hacia S/E Alto Jahuel.
01:57	S/E Rancagua F/S a solicitud del CDC para transferir consumos hacia S/E Alto Jahuel, debido a mala regulación de frecuencia, tensión y recuperar la mayor cantidad de consumos pérdidos en la zona.
02:00	C. La Higuera empieza a verter.
02:10	C. Coya U-5 sincronizada hacia S/E Alto Jahuel.
02:12	C. Sauzal U-2 F/S a solicitud del CDC para transferir su inyección hacia S/E Alto Jahuel.
02:40	S/E Rancagua E/S desde S/E Alto Jahuel.
02:41	Recuperados los consumos de SS/EE Hospital y Fátima parcialmente.
02:51	Recuperados los consumos del TR 1 de S/E Isla de Maipo.
03:00	C. Sauzal U-2 sincronizada hacia S/E Alto Jahuel.
03:09	Recuperados el 100% de los consumos de S/E Isla de Maipo.
03:15	Recuperados los consumos de SS/EE Cachapoal y Machalí.
03:37	C. Esperanza unidades con informe de limitación, no obedecen orden de partida remota.
03:42	Recuperado 2 MW de consumos de S/E Papelera Talagante.
03:47	C. Chacayes U-1 sincronizada hacia S/E Alto Jahuel.

Hora	Observación
04:01	Recuperado los consumos de S/E Tuniche.
04:19	S/E Punta de Cortés con solicitud de intervención de curso forzoso. Causa informada: A solicitud de Transelec para iniciar reparación de línea de 154 kV Tinguiririca – Rancagua – Alto Jahuel 1 y 2.
04:19	S/E Malloa con solicitud de intervención de curso forzoso. Causa informada: A solicitud de Transelec para iniciar reparación de línea de 154 kV Tinguiririca – Rancagua – Alto Jahuel 1 y 2
04:23	C. Esperanza unidades DS-1 y DS-2 sincronizadas, TG-1 indisponible. Causa informada: Falla en la partida por problemas en el calefactor del aceite.
05:07	C. M. Valle Central CDC solicita reducir sus consumos desde 28 a 5 MW (consumos esenciales), para controlar la transferencia en transformadores de 110/154 kV de S/E Sauzal.
05:18	C. Sauzalito sincronizada.
05:54	Se recuperan 3.5 MW de S/E Lo Miranda.
06:13	Se recuperan los consumos de S/E Loreto.
06:13	Se recuperan 1,8 MW de S/E Lo Miranda.
07:06	C. Guacolda U-5 baja al mínimo técnico con solicitud de intervención de curso forzoso. Causa informada: Realizar revisión al motor del calentador de aire de la caldera por ruido anormal, este equipo es crítico para la unidad.
07:28	Chilectra SDAC habilitado.
08:11	S/E Rancagua se reduce 1 MW de consumos a solicitud del CDC por control de transferencia del TR4 de 110/154 kV.
08:16	S/E Rancagua alimentador Berrios reduce 3 MW de consumos a solicitud del CDC por control de transferencia de TR4 de 110/154 kV.
08:23	Compañía Papelera Talagante reduce 1 MW de consumos por control de transferencia de línea de 66 kV Paine – Bajo Melipilla.
08:26	S/E Rancagua alimentador Río Peuco reduce 3 MW de consumos a solicitud del CDC por control de transferencia de TR4 de 110/154 kV.
08:41	S/E Rancagua se reduce 4,3 MW de consumos a solicitud del CDC por control de transferencia de TR4 de 110/154 kV.
08:42	Línea de 44 kV Carena - Puente Alto interrupción forzada por protecciones.
08:42	C. Carena sale del servicio en forma intempestiva con 9 MW.
08:47	Cerrada línea de 154 kV Rancagua – A. Jahuel 1 queda abierto puentes en estructura 359, CDC solicita normalizar el 100 % de los consumos de SS/EE Rancagua y Paine.
09:03	C. Guacolda U-5 cancelada solicitud de intervención de curso forzoso y queda con solicitud de desconexión de curso forzoso. Causa informada: Falla en motor de calentador de aire de la caldera.
09:06	C. Guacolda U-3 sincronizada.
09:17	Compañía Papelera Talagante normaliza el 100 % de los consumos.
09:37	S/E Cerro Navia habilitado trip por contingencia específica del ATR Nº 2 ó 5 de 220/110 kV, 400 MVA sobre la línea de 110 kV Cerro Navia – El Salto 2.
09:39	CDC solicita a C. Minera Valle Central reducir sus consumos a 0 MW para realizar cambio de barra de 110 kV en S/E Sauzal.
09:40	CDC solicita a C. Minera Valle Central normalizar el 100 % de sus consumos, queda alimentado desde S/E Rancagua.
10:13	C. Sauzal U-2 cambia su inyección hacia S/E Rancagua.
10:20	S/E Lo Miranda reduce 2,5 MW de consumos por control de transferencia de línea de 66 kV Rancagua – Punta de Cortés.
10:15	S/E Nahuelbuta interruptor 52CT1 general de barra de 13,2 kV interrupción forzada por protecciones, se pierden 2.9 MW de consumos correspondientes a los alimentadores Roblería y Parronal.
10:37	S/E Nahuelbuta cerrado interruptor 52CT1 general de barra de 13,2 kV y normalizados consumos.
10:39	S/E Punta de Cortés cerrado interruptor 52A2 de línea 1 de 154 kV Tinguiririca – T 342.
10:39	Línea de 154 kV Tinguiririca – Rancagua – A. Jahuel 1 con solicitud de intervención de curso forzoso. Causa informada: Trabajos en circuito adyacente.
10:41	C. Quintero TG-1B sincronizada por disponibilidad de GNL.
10:56	S/E Rancagua abierto interruptor 52B5 de línea de 66 kV Rancagua – Punta de Cortés para realizar microcorte afectando los consumos de S/E Punta de Cortés con 54 MW. Causa informada: Normalización de topología por 154 kV.
10:56	S/E Punta de Cortés cerrado 52AT quedando normalizada topología por 154 kV y normalizado el 100 % de los consumos.

Hora	Observación
11:00	C. Guacolda U-3 cancelada solicitud de desconexión de curso forzoso.
11:05	Línea de 66 kV Arauco – Horcones con solicitud de intervención de curso forzoso. Causa informada: Reparar anormalidad en desconectador de línea 89BL2 en C. Arauco.
12:45	C. Machicura limitada a 33 MW. Causa informada: Trabajos en obras civiles en desarrollo aguas debajo de central San Ignacio
13:23	C. Quintero TG-1A sincronizada por disponibilidad de GNL.
15:00	Cerrada línea de 44 kV Carena – CMPC Puente Alto.
15:14	C. Carena sincronizada.
17:14	Línea de 66 kV Arauco – Horcones cancelada solicitud de intervención de curso forzoso.
17:15	S/E Maule banco de CC.EE. N°1 de 15 kV, 6 MVAr indisponible. Causa informada: Punto caliente en mufa de salida fase B.
18:24	C. Arauco sincronizada.
19:27	C. Guacolda U-5 sincronizada.
20:16	C. Pehuenche U-2 toma la regulación de frecuencia.
21:05	Cerrada línea de 154 kV Punta de Cortés – Rancagua – Alto Jahuel 2 y con solicitud de intervención de curso forzoso. Causa informada: Trabajos de reparación en línea adyacente. Se mantiene abierto 52A3 en S/E Punta de Cortés.
21:05	Línea de 154 kV Tinguiririca – Rancagua – A. Jahuel 1 cancelada solicitud de intervención de curso forzoso.
23:40	S/E Cerro Navia deshabilitado trip por contingencia específica del ATR Nº 2 ó 5 de 220/110 kV, 400 MVA sobre la línea de 110 kV Cerro Navia – El Salto 2.
23:45	Línea de 66 kV Santa Rosa – Alhué interrupción forzada por protecciones con reconexión automática con éxito.

4.2. Otras Observaciones

Otras Observaciones
Laguna del Maule promedio de extracción diaria para riego es 0 m^3/s.
C. Pehuenche bocatoma Maule promedio de vertimiento diario es 0 m^3/s.
Frecuencia máxima y mínima registrada durante el día: 50.22 y 49.78 Hz.

4.3. Nuevas Instalaciones

Empresa	Instalación	Hora

5. DISPONIBILIDAD SCADA

Empresa	Instalación	Fecha F/S	Hora F/S	Fecha E/S	Hora E/S
Colbún	SS/EE Chagres, Calera Centro, Cerro Calera y Esperanza.	10/08/2010	14:30		
Gener	Datos scada con intermitencia.	04/09/2015	14:30		
E. Coyanco	C. Guayacán datos scada P, Q y S de las unidades generadoras. (*)	28/09/2015	12:13		
Transquillota	S/E San Luis datos scada.	29/10/2015	00:00		
Transelec	PDCE fase 2 Charrúa 500 kV y Charrúa 220 kV con error de telemetría.	25/12/2015	20:00		

Empresa	Instalación	Fecha F/S	Hora F/S	Fecha E/S	Hora E/S
Transelec	S/E Carrera Pinto datos scada de Tº con mucha diferencia respecto a SS/EE cercanas.	06/01/2016	07:15		
E. Panguipulli	S/E Interconexión paño JL2 datos scada.	06/01/2016	09:22		
Transelec	S/E Diego de Almagro paño HT4 datos scada.	06/01/2015	09:22	07/01/2016	16:05
Cía. Minera Franke	S/E Diego de Almagro paño H7 datos scada.	06/01/2016	09:22		
Transelec	SS/EE Diego de Almagro y Paposo data scada y telecontrol.	07/01/2016	00:22	07/01/2016	09:15
STS	Dato scada	07/01/2016	10:50	07/01/2016	11:47
Transelec	SS/EE Temuco,Pullinque, Valdivia y Rahue data y telecontrol.	07/01/2016	23:10	07/01/2016	23:24

* Señales no implementadas.

6. COMUNICACIONES

Empresa	Instalación	Fecha F/S	Hora F/S	Fecha E/S	Hora E/S
Duke Energy	C. Yungay Hot line.	28/12/2015	14:30		

ANEXO Nº 4
Detalle de mantenimientos programados y forzados correspondientes al día 07 de enero de 2016

Nro.	Empresa	Resumen	Tipo	Cuando	Objetivo	Fec.Ini.Prg	Hora Ini.Prg	Fec.Ter.Prg	Hora Ter.Prg	Fec.Ini.Efec	Hora Ini.Efec	Fec.Ter.Efec	Hora Ter.Efec
SD46302/2015	cge	Subestación : M.PATRIA_____066 Otro Elemento de Subestación : OTROS N ° : Intervención / Programada Ningún Consumo Afectado	Intervencion	Programada	A solicitud de Transelec debido a trabajo en sus instalaciones, relacionadas con SODI N°5. requiere precaución interruptor 52CT1 y 52ET2 de SE Monte Patria.	07/01/2016	07:00	07/01/2016	18:00	07/01/2016	09:14	07/01/2016	16:36
SD46919/2015	transelec	Subestacion :OVALLE_____066 Linea :MOLLES_____066 - OVALLE_____066 CTO1\n Tramo: MOLLES_____066 - M.PATRIA_____066 CTO1 Tramo: M.PATRIA_____066 - OVALLE_____066 CTO1 Intervencion /Programada Comentario:Equipo:L. 2x66 KV L MOLLES - OVALLE, C 1 Tipo Trabajo:Corte y poda de árboles Descripción del Trabajo Corte o poda de árboles, vanos 24 - 25,26 - 27, 29 - 30, 112 - 113. despejar espinos en base de estructuras 18, 19 y 21. Sodi N° 7. Restricciones:Restriccion a la reconexion Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas No reconectar interruptores asociados a la Línea 66 kV- Molles - Ovalle 1 Instalaciones con riesgo Línea 66 kV- Molles - Ovalle 1 Observaciones No hay Ningun Consumo Afectado Fecha Inicio:2016-01-07 Hora de Inicio:07:00 Fecha Termino:2016-01-07 Hora de Termino:18:00 Solicita intervención:ADELVALLETrabajo a realizar: Roce y pode franja servidumbre	Intervencion	Programada	Equipo:L. 2x66 KV L MOLLES - OVALLE, C 1 Tipo Trabajo:Corte y poda de árboles Descripción del Trabajo Corte o poda de árboles, vanos 24 - 25,26 - 27, 29 - 30, 112 - 113. despejar espinos en base de estructuras 18, 19 y 21. Sodi N° 7. Restricciones:Restriccion a la reconexion Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas No reconectar interruptores asociados a la Línea 66 kV- Molles - Ovalle 1 Instalaciones con riesgo Línea 66 kV- Molles - Ovalle 1 Observaciones No hay	07/01/2016	07:00	07/01/2016	18:00	07/01/2016	08:32	07/01/2016	16:36

Nro.	Empresa	Resumen	Tipo	Cuando	Objetivo	Fec.Ini.Prg	Hora Ini.Prg	Fec.Ter.Prg	Hora Ter.Prg	Fec.Ini.Efec	Hora Ini.Efec	Fec.Ter.Efec	Hora Ter.Efec
SD46930/2015	transelec	Subestacion :OVALLE_____066 Linea :MOLLES_____066 - OVALLE_____066 CTO2\n Tramo: MOLLES_____066 - M.PATRIA_____066 CTO2 Tramo: M.PATRIA_____066 - OVALLE_____066 CTO2 Intervencion /Programada Comentario:Equipo:L. 2X66 KV L MOLLES - OVALLE, C 2 Tipo Trabajo:Corte y poda de árboles Descripción del Trabajo Corte o poda de árboles, vanos 24 - 25,26 - 27, 29 - 30, 112 - 113. despejar espinos en base de estructuras 18, 19 y 21. Sodi N° 5. Restricciones:Restriccion a la reconexion Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas No reconectar interruptores asociados a la Línea 66 kV- Molles - Ovalle 2 Instalaciones con riesgo Línea 66 kV- Molles - Ovalle 2 Observaciones no hay Ningun Consumo Afectado Fecha Inicio:2016-01-07 Hora de Inicio:07:00 Fecha Termino:2016-01-07 Hora de Termino:18:00 Solicita intervención:ADELVALLETrabajo a realizar: Roce y pode franja servidumbre	Intervencion	Programada	Equipo:L. 2X66 KV L MOLLES - OVALLE, C 2 Tipo Trabajo:Corte y poda de árboles Descripción del Trabajo Corte o poda de árboles, vanos 24 - 25,26 - 27, 29 - 30, 112 - 113. despejar espinos en base de estructuras 18, 19 y 21. Sodi N° 5. Restricciones:Restriccion a la reconexion Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas No reconectar interruptores asociados a la Línea 66 kV- Molles - Ovalle 2 Instalaciones con riesgo Línea 66 kV- Molles - Ovalle 2 Observaciones no hay	07/01/2016	07:00	07/01/2016	18:00	07/01/2016	08:32	07/01/2016	16:36
SD46938/2015	transelec	Subestacion :L.AGUIRRE_____220 (TRANSELEC) Linea :L.AGUIRRE_____220 - RAPEL_____220 CTO 1 (Proyecto Lo Aguirre)\n Tramo: L.AGUIRRE_____220 - A.MELIP_____220 CTO 1 Tramo: A.MELIP_____220 - RAPEL_____220 CTO 1 Intervencion /Programada Comentario:Equipo:L. 220 kV Rapel - Lo Aguirre Circ. 1. Tipo Trabajo:Corte y poda de árboles Descripción del Trabajo Corte y poda de árboles. Restricciones:Restriccion a la reconexion Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas No reconectar interruptores asociados a la línea de 220 kV Rapel - Lo Aguirre circuito 1 y 2. Instalaciones con riesgo Línea de 220 kV Rapel - Lo Aguirre circuito 1 o 2. Observaciones Coordinado con Chilquinta. Ningun Consumo Afectado Fecha Inicio:2016-01-07 Hora de Inicio:08:00 Fecha Termino:2016-01-07 Hora de Termino:18:00 Solicita intervención:ADELVALLETrabajo a realizar: Roce y pode franja servidumbre	Intervencion	Programada	Equipo:L. 220 kV Rapel - Lo Aguirre Circ. 1. Tipo Trabajo:Corte y poda de árboles Descripción del Trabajo Corte y poda de árboles. Restricciones:Restriccion a la reconexion Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas No reconectar interruptores asociados a la línea de 220 kV Rapel - Lo Aguirre circuito 1 y 2. Instalaciones con riesgo Línea de 220 kV Rapel - Lo Aguirre circuito 1 o 2. Observaciones Coordinado con Chilquinta.	07/01/2016	08:00	07/01/2016	18:00	07/01/2016	08:07	07/01/2016	17:30

Nro.	Empresa	Resumen	Tipo	Cuando	Objetivo	Fec.Ini.Prg	Hora Ini.Prg	Fec.Ter.Prg	Hora Ter.Prg	Fec.Ini.Efec	Hora Ini.Efec	Fec.Ter.Efec	Hora Ter.Efec
SD46942/2015	transelec	Subestacion :L.AGUIRRE_____220 (TRANSELEC) Linea :L.AGUIRRE_____220 - RAPEL_____220 CTO 2 (Proyecto Lo Aguirre)\n Tramo: L.AGUIRRE_____220 - A.MELIP_____220 CTO 2 Tramo: A.MELIP_____220 - RAPEL_____220 CTO 2 Intervencion /Programada Comentario:Equipo:L. 220 kV Rapel - Lo Aguirre Circ. 2. Tipo Trabajo:Corte y poda de árboles Descripción del Trabajo Corte y poda de árboles. Restricciones:Restriccion a la reconexion Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas No reconectar interruptores asociados a la línea de 220 kV Rapel - Lo Aguirre circuito 1 y 2. Instalaciones con riesgo Línea de 220 kV Rapel - Lo Aguirre circuito 1 o 2. Observaciones Coordinado con Chilquinta. Ningun Consumo Afectado Fecha Inicio:2016-01-07 Hora de Inicio:08:00 Fecha Termino:2016-01-07 Hora de Termino:18:00 Solicita intervención:ADELVALLETrabajo a realizar: Roce y pode franja servidumbre	Intervencion	Programada	Equipo:L. 220 kV Rapel - Lo Aguirre Circ. 2. Tipo Trabajo:Corte y poda de árboles Descripción del Trabajo Corte y poda de árboles. Restricciones:Restriccion a la reconexion Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas No reconectar interruptores asociados a la línea de 220 kV Rapel - Lo Aguirre circuito 1 y 2. Instalaciones con riesgo Línea de 220 kV Rapel - Lo Aguirre circuito 1 o 2. Observaciones Coordinado con Chilquinta.	07/01/2016	08:00	07/01/2016	18:00	07/01/2016	08:07	07/01/2016	17:30
SD47008/2015	transelec	Subestacion :CONCEPCION____154 Otro Elemento :EQUIPOS DE MEDIDA FACTURACIÓN\n Elemento: CNCPCION_154_A6 - JEM10 - 96320026 Intervencion /Programada Comentario:Equipo:S/E Concepción: Paño A6-Medidor JEM10 Tipo Trabajo:Análisis Fasorial Descripción del Trabajo S/E Concepción: Verificación y análisis del medidor de energía Restricciones:Normalización sujeta a coordinación Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas No hay. Instalaciones con riesgo Línea 154kV Concepción-San Vicente 2 (Durante la faena) Observaciones No hay Ningun Consumo Afectado Fecha Inicio:2016-01-07 Hora de Inicio:08:00 Fecha Termino:2016-01-07 Hora de Termino:18:00 Solicita intervención:ADELVALLETrabajo a realizar: Otro Tipo de Trabajo	Intervencion	Programada	Equipo:S/E Concepción: Paño A6-Medidor JEM10 Tipo Trabajo:Análisis Fasorial Descripción del Trabajo S/E Concepción: Verificación y análisis del medidor de energía Restricciones:Normalización sujeta a coordinación Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas No hay. Instalaciones con riesgo Línea 154kV Concepción-San Vicente 2 (Durante la faena) Observaciones No hay	07/01/2016	08:00	07/01/2016	18:00	07/01/2016	10:37	07/01/2016	16:03

Nro.	Empresa	Resumen	Tipo	Cuando	Objetivo	Fec.Ini.Prg	Hora Ini.Prg	Fec.Ter.Prg	Hora Ter.Prg	Fec.Ini.Efec	Hora Ini.Efec	Fec.Ter.Efec	Hora Ter.Efec
SD47089/2015	transelec	Subestacion :TEMUCO_____220 Linea :TEMUCO_____220 - CAUTIN (NVA TCO)_____220 CTO1\n Tramo: TEMUCO_____220 - CAUTIN (NVA TCO)_____220 CTO1 Intervencion /Programada Comentario:Equipo:LÍNEA 220 kV TEMUCO - CAUTIN C1 Tipo Trabajo:Trabajos Sistema de FO Descripción del Trabajo En S/E Temuco: Mantenimiento preventivo basico equipos repartidor de Fibra Optica ., dirección S/E Cautín , verificación de niveles. Restricciones:Teleprotecciones bloqueadas con respaldo Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas SW mantenimiento F.O desconectada en: Cautín TDD, TAD-FO (TPO11, TPO13); Temuco TDD, TAD-FO (TPO11, TPO13) Instalaciones con riesgo LÍNEA 220 kV TEMUCO-CAUTIN CIRCUITO 1 O LÍNEA 220 kV TEMUCO-CAUTIN, CIRCUITO 2 (DURANTE LA FAENA) Observaciones NO HAY.- Ningun Consumo Afectado Fecha Inicio:2016-01-07 Hora de Inicio:10:00 Fecha Termino:2016-01-07 Hora de Termino:15:00 Solicita intervención:ADELVALLETrabajo a realizar: Otro Tipo de Trabajo	Intervencion	Programada	Equipo:LÍNEA 220 kV TEMUCO - CAUTIN C1 Tipo Trabajo:Trabajos Sistema de FO Descripción del Trabajo En S/E Temuco: Mantenimiento preventivo basico equipos repartidor de Fibra Optica ., dirección S/E Cautín , verificación de niveles. Restricciones:Teleprotecciones bloqueadas con respaldo Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas SW mantenimiento F.O desconectada en: Cautín TDD, TAD-FO (TPO11, TPO13); Temuco TDD, TAD-FO (TPO11, TPO13) Instalaciones con riesgo LÍNEA 220 kV TEMUCO-CAUTIN CIRCUITO 1 O LÍNEA 220 kV TEMUCO-CAUTIN, CIRCUITO 2 (DURANTE LA FAENA) Observaciones NO HAY.-	07/01/2016	10:00	07/01/2016	15:00	07/01/2016	10:37	07/01/2016	15:04

Nro.	Empresa	Resumen	Tipo	Cuando	Objetivo	Fec.Ini.Prg	Hora Ini.Prg	Fec.Ter.Prg	Hora Ter.Prg	Fec.Ini.Efec	Hora Ini.Efec	Fec.Ter.Efec	Hora Ter.Efec
SD47090/2015	transelec	Subestacion :TEMUCO_____220 Linea :TEMUCO_____220 - CAUTIN (NVA TCO)_____220 CTO2\n Tramo: TEMUCO_____220 - CAUTIN (NVA TCO)_____220 CTO2 Intervencion /Programada Comentario:Equipo:LÍNEA 220 kV TEMUCO - CAUTIN C2 Tipo Trabajo:Trabajos Sistema de FO Descripción del Trabajo En S/E Temuco: Mantenimiento preventivo basico equipos repartidor de Fibra Optica ., dirección S/E Cautín , verificación de niveles. Restricciones:Teleprotecciones bloqueadas con respaldo Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas SW mantenimiento F.O desconectada en: Cautín TDD, TAD-FO (TPO11, TPO13); Temuco TDD, TAD-FO (TPO11, TPO13) Instalaciones con riesgo LÍNEA 220 kV TEMUCO-CAUTIN CIRCUITO 1 O LÍNEA 220 kV TEMUCO-CAUTIN, CIRCUITO 2 (DURANTE LA FAENA) Observaciones NO HAY.- Ningun Consumo Afectado Fecha Inicio:2016-01-07 Hora de Inicio:10:00 Fecha Termino:2016-01-07 Hora de Termino:15:00 Solicita intervención:ADELVALLETrabajo a realizar: Otro Tipo de Trabajo	Intervencion	Programada	Equipo:LÍNEA 220 kV TEMUCO - CAUTIN C2 Tipo Trabajo:Trabajos Sistema de FO Descripción del Trabajo En S/E Temuco: Mantenimiento preventivo basico equipos repartidor de Fibra Optica ., dirección S/E Cautín , verificación de niveles. Restricciones:Teleprotecciones bloqueadas con respaldo Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas SW mantenimiento F.O desconectada en: Cautín TDD, TAD-FO (TPO11, TPO13); Temuco TDD, TAD-FO (TPO11, TPO13) Instalaciones con riesgo LÍNEA 220 kV TEMUCO-CAUTIN CIRCUITO 1 O LÍNEA 220 kV TEMUCO-CAUTIN, CIRCUITO 2 (DURANTE LA FAENA) Observaciones NO HAY.-	07/01/2016	10:00	07/01/2016	15:00	07/01/2016	10:37	07/01/2016	15:04
SD47114/2015	cge	Subestación : TALCA_____066 Otro Elemento de Subestación : OTROS N ° : Intervención / Programada Ningún Consumo Afectado	Intervencion	Programada	Realizar modificación en registro de datos en los Relés SEL: 387, 311C y 551. Correspondientes al Paño BT2 y 52CT2.	07/01/2016	09:00	07/01/2016	18:00	07/01/2016	11:53	07/01/2016	14:46
SD47155/2015	gener	Subestación : GUACOLDA_____220 Linea : MAITENCILLO___220 - GUACOLDA_____220 CTO1 Tramo : MAITENCILLO___220 - GUACOLDA_____220 CTO1 Intervención / Programada Ningún Consumo Afectado	Intervencion	Programada	Lavado de Aislación / Con Bloqueo a la reconexión LAVADO AISLACION DESDE PATIO SALIDA A ESTR. 94. SISTEMA ENERGIZADO. Restricciones: En S/E Guacolda: No reconectar interruptor 52J1; 52J2 En S/E Maitencillo: No reconectar interruptor 52J5; 52J6	07/01/2016	08:00	07/01/2016	17:00	07/01/2016	09:55	07/01/2016	14:51
SD47169/2015	gener	Subestación : GUACOLDA_____220 Linea : MAITENCILLO___220 - GUACOLDA_____220 CTO2 Tramo : MAITENCILLO___220 - GUACOLDA_____220 CTO2 Intervención / Programada Ningún Consumo Afectado	Intervencion	Programada	Lavado de Aislación / Con Bloqueo a la reconexión LAVADO AISLACION DESDE PATIO SALIDA A ESTR. 94. SISTEMA ENERGIZADO. Restricciones: En S/E Guacolda: No reconectar interruptor 52J1; 52J2 En S/E Maitencillo: No reconectar interruptor 52J5; 52J6	07/01/2016	08:00	07/01/2016	17:00	07/01/2016	09:55	07/01/2016	14:51

Nro.	Empresa	Resumen	Tipo	Cuando	Objetivo	Fec.Ini.Prg	Hora Ini.Prg	Fec.Ter.Prg	Hora Ter.Prg	Fec.Ini.Efec	Hora Ini.Efec	Fec.Ter.Efec	Hora Ter.Efec
SD47183/2015	gener	Subestación : GUACOLDA_____220 Linea : MAITENCILLO___220 - GUACOLDA_____220 CTO3 Tramo : MAITENCILLO___220 - GUACOLDA_____220 CTO3 Intervención / Programada Ningún Consumo Afectado	Intervencion	Programada	Lavado de Aislación / Con Bloqueo a la reconexión LAVADO AISLACION DESDE PATIO MUFAS A ESTR. 114. SISTEMA ENERGIZADO. Restricciones: En S/E Guacolda: No reconectar interruptor 52J3; 52J4 En S/E Maitencillo: No reconectar interruptor 52J9; 52J10	07/01/2016	08:00	07/01/2016	17:00	07/01/2016	09:55	07/01/2016	15:15
SD47293/2015	transelec	Subestacion :NOGALES_____220 Linea :NOGALES_____220 - L.VILOS_____220 CTO1\n Tramo: NOGALES_____220 - L.VILOS_____220 CTO1 Intervencion /Programada Comentario:Equipo:L. 2X220 KV NOGALES - LOS VILOS, C 1 Tipo Trabajo:Lavado de Aislación Descripción del Trabajo Lavado cadenas de aislación, entre estructuras 244 y 310. Restricciones:Restriccion a la reconexion Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas No reconectar interruptores asociados a Línea 220 KV Nogales - Los Vilos C1. Instalaciones con riesgo L. 2X220 KV NOGALES - LOS VILOS, C1. Observaciones No Hay. Ningun Consumo Afectado Fecha Inicio:2016-01-07 Hora de Inicio:07:00 Fecha Termino:2016-01-07 Hora de Termino:18:00 Solicita intervención:ADELVALLETrabajo a realizar: Lavado de Aislación	Intervencion	Programada	Equipo:L. 2X220 KV NOGALES - LOS VILOS, C 1 Tipo Trabajo:Lavado de Aislación Descripción del Trabajo Lavado cadenas de aislación, entre estructuras 244 y 310. Restricciones:Restriccion a la reconexion Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas No reconectar interruptores asociados a Línea 220 KV Nogales - Los Vilos C1. Instalaciones con riesgo L. 2X220 KV NOGALES - LOS VILOS, C1. Observaciones No Hay.	07/01/2016	07:00	07/01/2016	18:00	07/01/2016	08:33	07/01/2016	18:00

Nro.	Empresa	Resumen	Tipo	Cuando	Objetivo	Fec.Ini.Prg	Hora Ini.Prg	Fec.Ter.Prg	Hora Ter.Prg	Fec.Ini.Efec	Hora Ini.Efec	Fec.Ter.Efec	Hora Ter.Efec
SD47299/2015	transelec	Subestacion :P.AZUCAR_____220 Linea :P.AZUCAR_____220 - PUNTA_COLORADA___220 CTO2\n Tramo: P.AZUCAR_____220 - PUNTA_COLORADA___220 CTO2 Intervencion /Programada Comentario:Equipo:L. 2X220 KV P. AZÚCAR - P. COLORADA, C2 Tipo Trabajo:Solicitado por Terceros Descripción del Trabajo Modificación estructura N° 226, debido a la construcción de doble vía en ruta 5, tramo La Serena ? Vallenar. El trabajo lo realizará la empresa MONGAR ?Montajes GAR Ltda., contratada por SACYR para este efecto. Restricciones:Restriccion a la reconexion Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas No reconectar interruptores asociados a Línea 220 KV Pan de Azúcar - Punta Colorada C2 Instalaciones con riesgo LÍNEA 220 kV PAN DE AZÚCAR - PUNTA COLORADA, C2 Observaciones NO HAY Ningun Consumo Afectado Fecha Inicio:2016-01-07 Hora de Inicio:07:00 Fecha Termino:2016-01-07 Hora de Termino:18:00 Solicita intervención:ADELVALLETrabajo a realizar: Otro Tipo de Trabajo	Intervencion	Programada	Equipo:L. 2X220 KV P. AZÚCAR - P. COLORADA, C2 Tipo Trabajo:Solicitado por Terceros Descripción del Trabajo Modificación estructura N° 226, debido a la construcción de doble vía en ruta 5, tramo La Serena ? Vallenar. El trabajo lo realizará la empresa MONGAR ?Montajes GAR Ltda., contratada por SACYR para este efecto. Restricciones:Restriccion a la reconexion Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas No reconectar interruptores asociados a Línea 220 KV Pan de Azúcar - Punta Colorada C2 Instalaciones con riesgo LÍNEA 220 kV PAN DE AZÚCAR - PUNTA COLORADA, C2 Observaciones NO HAY	07/01/2016	07:00	07/01/2016	18:00	07/01/2016	08:33	07/01/2016	18:00
SD47301/2015	transelec	Subestacion :NOGALES_____220 Linea :NOGALES_____220 - L.VILOS_____220 CTO2\n Tramo: NOGALES_____220 - L.VILOS_____220 CTO2 Intervencion /Programada Comentario:Equipo:L. 2x220 KV NOGALES - LOS VILOS, C 2 Tipo Trabajo:Lavado de Aislación Descripción del Trabajo Lavado cadenas de aislación, entre estructuras 244 y 310. Restricciones:Restriccion a la reconexion Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas No reconectar interruptores asociados a Línea 220 KV Nogales - Los Vilos C2. Instalaciones con riesgo L. 2X220 KV NOGALES - LOS VILOS, C2. Observaciones No Hay Ningun Consumo Afectado Fecha Inicio:2016-01-07 Hora de Inicio:07:00 Fecha Termino:2016-01-07 Hora de Termino:18:00 Solicita intervención:ADELVALLETrabajo a realizar: Lavado de Aislación	Intervencion	Programada	Equipo:L. 2x220 KV NOGALES - LOS VILOS, C 2 Tipo Trabajo:Lavado de Aislación Descripción del Trabajo Lavado cadenas de aislación, entre estructuras 244 y 310. Restricciones:Restriccion a la reconexion Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas No reconectar interruptores asociados a Línea 220 KV Nogales - Los Vilos C2. Instalaciones con riesgo L. 2X220 KV NOGALES - LOS VILOS, C2. Observaciones No Hay	07/01/2016	07:00	07/01/2016	18:00	07/01/2016	08:33	07/01/2016	18:00

Nro.	Empresa	Resumen	Tipo	Cuando	Objetivo	Fec.Ini.Prg	Hora Ini.Prg	Fec.Ter.Prg	Hora Ter.Prg	Fec.Ini.Efec	Hora Ini.Efec	Fec.Ter.Efec	Hora Ter.Efec
SD47302/2015	transelec	Subestacion :P.AZUCAR_____220 Linea :P.AZUCAR_____220 - PUNTA_COLORADA___220 CTO1\n Tramo: P.AZUCAR_____220 - PUNTA_COLORADA___220 CTO1 Intervencion /Programada Comentario:Equipo:L. 2X220 KV P. AZÚCAR - P. COLORADA, C1 Tipo Trabajo:Solicitado por Terceros Descripción del Trabajo modificación estructura N° 226, debido a la construcción de doble vía en ruta 5, tramo La Serena ? Vallenar. El trabajo lo realizará la empresa MONGAR ?Montajes GAR Ltda., contratada por SACYR para este efecto. Restricciones:Restriccion a la reconexion Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas No reconectar interruptores asociados a Línea 220 KV Pan de Azúcar - Punta Colorada C1 Instalaciones con riesgo LÍNEA 220 kV PAN DE AZÚCAR - PUNTA COLORADA, C1 Observaciones NO HAY Ningun Consumo Afectado Fecha Inicio:2016-01-07 Hora de Inicio:07:00 Fecha Termino:2016-01-07 Hora de Termino:18:00 Solicita intervención:ADELVALLETrabajo a realizar: Otro Tipo de Trabajo	Intervencion	Programada	Equipo:L. 2X220 KV P. AZÚCAR - P. COLORADA, C1 Tipo Trabajo:Solicitado por Terceros Descripción del Trabajo modificación estructura N° 226, debido a la construcción de doble vía en ruta 5, tramo La Serena ? Vallenar. El trabajo lo realizará la empresa MONGAR ?Montajes GAR Ltda., contratada por SACYR para este efecto. Restricciones:Restriccion a la reconexion Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas No reconectar interruptores asociados a Línea 220 KV Pan de Azúcar - Punta Colorada C1 Instalaciones con riesgo LÍNEA 220 kV PAN DE AZÚCAR - PUNTA COLORADA, C1 Observaciones NO HAY	07/01/2016	07:00	07/01/2016	18:00	07/01/2016	08:33	07/01/2016	18:00
SD47303/2015	transelec	Subestacion :C.PINTO_____220 Otro Elemento :SECCIONES DE BARRA\n Elemento: SECCION 1 Intervencion /Programada Comentario:Equipo:BARRA 220 KV - CPI Tipo Trabajo:Montaje de equipos o reles en tableros Descripción del Trabajo S/E Carrera Pinto: Obras civiles a nivel de piso (Obra ampliación de la subestación) (4162 - 4163). Restricciones:Restriccion a la reconexion Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas S/E Carrera Pinto: No reconectar interruptores asociados a la Barra 220 KV Instalaciones con riesgo BARRA 220 KV - CARRERA PINTO Observaciones NO HAY Ningun Consumo Afectado Fecha Inicio:2016-01-07 Hora de Inicio:08:00 Fecha Termino:2016-01-31 Hora de Termino:18:00 Solicita intervención:ADELVALLETrabajo a realizar: Otro Tipo de Trabajo	Intervencion	Programada	Equipo:BARRA 220 KV - CPI Tipo Trabajo:Montaje de equipos o reles en tableros Descripción del Trabajo S/E Carrera Pinto: Obras civiles a nivel de piso (Obra ampliación de la subestación) (4162 - 4163). Restricciones:Restriccion a la reconexion Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas S/E Carrera Pinto: No reconectar interruptores asociados a la Barra 220 KV Instalaciones con riesgo BARRA 220 KV - CARRERA PINTO Observaciones NO HAY	07/01/2016	08:00	31/01/2016	18:00	07/01/2016	08:33	07/01/2016	18:00
SD47344/2015	gener	Subestación : FLORIDA_____110 Linea : FLORIDA_____110 - L.VIZCACHAS___110 CTO2 Tramo : FLORIDA_____110 - L.VIZCACHAS___110 CTO2 Desconexión / Programada Ningún Consumo Afectado	Desconexion	Programada	Refuerzo estructural y montaje de equipos en nuevo paño SE Las Lajas	07/01/2016	06:00	07/01/2016	18:00	07/01/2016	06:00	07/01/2016	19:00

Nro.	Empresa	Resumen	Tipo	Cuando	Objetivo	Fec.Ini.Prg	Hora Ini.Prg	Fec.Ter.Prg	Hora Ter.Prg	Fec.Ini.Efec	Hora Ini.Efec	Fec.Ter.Efec	Hora Ter.Efec
SD47348/2015	gener	Subestación : L.LAJA_____110 (chilec) Linea : L.LAJA_____110 - L.VIZCACHAS___110 CTO2 Tramo : L.LAJA_____110 - L.VIZCACHAS___110 CTO2 Desconexión / Programada Ningún Consumo Afectado	Desconexion	Programada	Refuerzo estructural y montaje de equipos en nuevo paño SE Las Lajas	07/01/2016	06:00	07/01/2016	18:00	07/01/2016	06:00	07/01/2016	19:00
SD47351/2015	gener	Subestación : QUELTEHUES____110 Linea : QUELTEHUES____110 - L.LAJA_____110 CTO2 Tramo : QUELTEHUES____110 - L.LAJA_____110 CTO2 Desconexión / Programada Ningún Consumo Afectado	Desconexion	Programada	Refuerzo estructural y montaje de equipos en nuevo paño SE Las Lajas	07/01/2016	06:00	07/01/2016	18:00	07/01/2016	06:00	07/01/2016	19:00
SD47354/2015	gener	Subestación : L.LAJA_____110 (chilec) Linea : MAITENES_____110 - L.LAJA_____110 CTO2 Tramo : MAITENES_____110 - L.LAJA_____110 CTO2 Desconexión / Programada Ningún Consumo Afectado	Desconexion	Programada	Refuerzo estructural y montaje de equipos en nuevo paño SE Las Lajas	07/01/2016	06:00	07/01/2016	18:00	07/01/2016	06:00	07/01/2016	19:00
SD47361/2015	transelec	Subestacion :L.AGUIRRE_____220 (TRANSELEC) Linea :L.AGUIRRE_____220 - RAPEL_____220 CTO 2 (Proyecto Lo Aguirre)\n Tramo: A.MELIP_____220 - RAPEL_____220 CTO 2 Intervencion /Programada Comentario:Equipo:S/E Lo Aguirre: Paño J4 Rapel 2 Tipo Trabajo:Trabajos varios Descripción del Trabajo S/E Lo Aguirre: Remplazo de tapón (Perno) en módulo de servicio (Manómetro) del compartimento G71 (TTCC de 52J4) Restricciones:Normalización sujeta a coordinación Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas S/E Lo Aguirre: Señalizar y delimitar zona de trabajo. Instalaciones con riesgo Línea 220 kV Rapel - Lo Aguirre Circuito 2 Observaciones Para la realización del trabajo se solicitará abierto int. 52J4 y los desconectadores 89J4-1 y 89J4-2. Ningun Consumo Afectado Fecha Inicio:2016-01-07 Hora de Inicio:08:00 Fecha Termino:2016-01-07 Hora de Termino:18:00 Solicita intervención:ADELVALLETrabajo a realizar: Otro Tipo de Trabajo	Intervencion	Programada	Equipo:S/E Lo Aguirre: Paño J4 Rapel 2 Tipo Trabajo:Trabajos varios Descripción del Trabajo S/E Lo Aguirre: Remplazo de tapón (Perno) en módulo de servicio (Manómetro) del compartimento G71 (TTCC de 52J4) Restricciones:Normalización sujeta a coordinación Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas S/E Lo Aguirre: Señalizar y delimitar zona de trabajo. Instalaciones con riesgo Línea 220 kV Rapel - Lo Aguirre Circuito 2 Observaciones Para la realización del trabajo se solicitará abierto int. 52J4 y los desconectadores 89J4-1 y 89J4-2.	07/01/2016	08:00	07/01/2016	18:00	07/01/2016	09:05	07/01/2016	11:20
SD47461/2015	cururos	Subestación : LA_CEBADA_____220 Otro Elemento de Subestación : OTROS N ° : Intervención / Programada Ningún Consumo Afectado	Intervencion	Programada	A solicitud de transelec ,no reconectar 52J2 S/E La Cebada inhabilitar switch 79/J2.motivo: Reemplazo cable de guardia Línea 220Kv La cebada ? Pan de Azúcar.	07/01/2016	07:00	07/01/2016	18:00	07/01/2016	07:27	07/01/2016	20:04

Nro.	Empresa	Resumen	Tipo	Cuando	Objetivo	Fec.Ini.Prg	Hora Ini.Prg	Fec.Ter.Prg	Hora Ter.Prg	Fec.Ini.Efec	Hora Ini.Efec	Fec.Ter.Efec	Hora Ter.Efec
SD47468/2015	transelec	Subestacion :A.JAHUEL_____220 Transformador :Transformador: Intervencion /Programada Comentario:Equipo:S/E A. Jahuel. Paño HT2 -ATR2. Tipo Trabajo:Lavado de Aislación Descripción del Trabajo S/E Alto Jahuel: Lavado de aislación de las cadenas de aisladores y de los equipos primarios que conforman la instalación. Paño HT2. Restricciones:Restriccion a la reconexion Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas S/E Alto Jahuel: No reconectar interruptores asociados a la barra principal de 110 kV sección 1 y 2. No reconectar interruptores asociados al ATR2 220/110/13,8 kV. Instalaciones con riesgo S/E Alto Jahuel: Barra 110 kV sección 1 y 2 ó Banco ATR2 220/110/13,2 kV. Observaciones Coordinado con Chilectra. Ningun Consumo Afectado Fecha Inicio:2016-01-07 Hora de Inicio:11:00 Fecha Termino:2016-01-07 Hora de Termino:14:00 Solicita intervención:ADELVALLETrabajo a realizar: Lavado de Aislación	Intervencion	Programada	Equipo:S/E A. Jahuel. Paño HT2 -ATR2. Tipo Trabajo:Lavado de Aislación Descripción del Trabajo S/E Alto Jahuel: Lavado de aislación de las cadenas de aisladores y de los equipos primarios que conforman la instalación. Paño HT2. Restricciones:Restriccion a la reconexion Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas S/E Alto Jahuel: No reconectar interruptores asociados a la barra principal de 110 kV sección 1 y 2. No reconectar interruptores asociados al ATR2 220/110/13,8 kV. Instalaciones con riesgo S/E Alto Jahuel: Barra 110 kV sección 1 y 2 ó Banco ATR2 220/110/13,2 kV. Observaciones Coordinado con Chilectra.	07/01/2016	11:00	07/01/2016	14:00	07/01/2016	12:37	07/01/2016	14:52
SD47472/2015	transelec	Subestacion :A.JAHUEL_____110 Transformador :Transformador: Intervencion /Programada Comentario:Equipo:S/E A. Jahuel. Paño HT1 -ATR1. Tipo Trabajo:Lavado de Aislación Descripción del Trabajo S/E Alto Jahuel: Lavado de aislación de las cadenas de aisladores y de los equipos primarios que conforman la instalación. Paño HT1. Restricciones:Restriccion a la reconexion Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas S/E Alto Jahuel: No reconectar interruptores asociados a la Barra de 110 kV sección 1 y 2 y asociados al ATR1 110/66/13,8 kV. Instalaciones con riesgo S/E Alto Jahuel: Barra 110 kV sección 1 y 2 ó ATR1 110/66/13,8 kV. Observaciones Coordinado con Chilectra. Ningun Consumo Afectado Fecha Inicio:2016-01-07 Hora de Inicio:08:00 Fecha Termino:2016-01-07 Hora de Termino:11:00 Solicita intervención:ADELVALLETrabajo a realizar: Lavado de Aislación	Intervencion	Programada	Equipo:S/E A. Jahuel. Paño HT1 -ATR1. Tipo Trabajo:Lavado de Aislación Descripción del Trabajo S/E Alto Jahuel: Lavado de aislación de las cadenas de aisladores y de los equipos primarios que conforman la instalación. Paño HT1. Restricciones:Restriccion a la reconexion Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas S/E Alto Jahuel: No reconectar interruptores asociados a la Barra de 110 kV sección 1 y 2 y asociados al ATR1 110/66/13,8 kV. Instalaciones con riesgo S/E Alto Jahuel: Barra 110 kV sección 1 y 2 ó ATR1 110/66/13,8 kV. Observaciones Coordinado con Chilectra.	07/01/2016	08:00	07/01/2016	11:00	07/01/2016	09:47	07/01/2016	12:35
SD47482/2015	cge	Subestación : QUILLOTA_____110 Linea : QUILLOTA_____110 - QUINQUIMO_____110 (con Marbella) Tramo : QUILLOTA_____110 - MARBELLA_____110 Intervención / Programada Ningún Consumo Afectado	Intervencion	Programada	Obras Civiles / Con Bloqueo a la reconexión. Obras a desarrollarse entre las estructuras 21 y 24 de la LT Quillota-Marbella. Considera bloqueo de reconexión del interruptor 52H3 de SE Quillota.	07/01/2016	08:00	07/01/2016	20:00	07/01/2016	08:30	07/01/2016	17:48

Nro.	Empresa	Resumen	Tipo	Cuando	Objetivo	Fec.Ini.Prg	Hora Ini.Prg	Fec.Ter.Prg	Hora Ter.Prg	Fec.Ini.Efec	Hora Ini.Efec	Fec.Ter.Efec	Hora Ter.Efec
SD47496/2015	chilectra	Subestación : FLORIDA_____110 Linea : FLORIDA_____110 - L.VIZCACHAS___110 CTO2 Tramo : FLORIDA_____110 - L.VIZCACHAS___110 CTO2 Desconexión / Programada Ningún Consumo Afectado	Desconexion	Programada	Se desconecta el circuito a solicitud de empresa AES Gener	07/01/2016	05:00	07/01/2016	19:00	07/01/2016	06:10	07/01/2016	19:02
SD47503/2015	colbun	Subestacion :COLBUN_____220Linea :COLBUN_____220 - CANDELARIA____220 CTO1Tramo: COLBUN_____220 - CANDELARIA____220 CTO1 Intervencion /ProgramadaComentario:Se realizara trabajos de roce, podas y Tala de Pinos en Sectores de Pelarco, Cumpeo y Curicó de la Línea Colbun - Candelaria, Se solicita bloquear la reconexión automática.Ningun Consumo AfectadoFecha Inicio:2016-01-07Hora de Inicio:08:00Fecha Termino:2016-01-07Hora de Termino:18:00Solicita intervención:COLBUN\JArancibiaTrabajo a realizar: Otro Tipo de Trabajo	Intervencion	Programada	Se realizara trabajos de roce, podas y Tala de Pinos en Sectores de Pelarco, Cumpeo y Curicó de la Línea Colbun - Candelaria, Se solicita bloquear la reconexión automática.	07/01/2016	08:00	07/01/2016	18:00	07/01/2016	09:28	07/01/2016	19:22
SD47504/2015	colbun	Subestacion :COLBUN_____220Linea :COLBUN_____220 - CANDELARIA____220 CTO2Tramo: COLBUN_____220 - CANDELARIA____220 CTO2 Intervencion /ProgramadaComentario:Se realizara trabajos de roce, podas y Tala de Pinos en Sectores de Pelarco, Cumpeo y Curicó de la Línea Colbun - Candelaria, Se solicita bloquear la reconexión automática.Ningun Consumo AfectadoFecha Inicio:2016-01-07Hora de Inicio:08:00Fecha Termino:2016-01-07Hora de Termino:18:00Solicita intervención:COLBUN\JArancibiaTrabajo a realizar: Otro Tipo de Trabajo	Intervencion	Programada	Se realizara trabajos de roce, podas y Tala de Pinos en Sectores de Pelarco, Cumpeo y Curicó de la Línea Colbun - Candelaria, Se solicita bloquear la reconexión automática.	07/01/2016	08:00	07/01/2016	18:00	07/01/2016	09:28	07/01/2016	19:22
SD47521/2015	cge	Subestación : P.AZUCAR_____066 Linea : P.AZUCAR_____066 - MARQUESA_____066 Tramo : P.AZUCAR_____066 - MARQUESA_____066 Intervención / Programada Ningún Consumo Afectado	Intervencion	Programada	Roce y pode franja servidumbre / Con Bloqueo a la reconexión, considera bloqueo reconexión interruptor 52B5 de S/E Pan de Azúcar.El bloqueo se realizará en forma paulatina y efectiva, solo en el momento que los trabajos se estén ejecutando.	07/01/2016	08:00	07/01/2016	18:00	07/01/2016	09:20	07/01/2016	19:12

Nro.	Empresa	Resumen	Tipo	Cuando	Objetivo	Fec.Ini.Prg	Hora Ini.Prg	Fec.Ter.Prg	Hora Ter.Prg	Fec.Ini.Efec	Hora Ini.Efec	Fec.Ter.Efec	Hora Ter.Efec
SD47566/2015	cge	Subestación : COCHARCAS_____066 Linea : COCHARCAS_____066 - HUALTE _____066 Tramo : COCHARCAS_____066 - HUALTE_____066 Intervención / Programada Ningún Consumo Afectado	Intervencion	Programada	Bloquear reconexión automática del interruptor 52B5 de S/E Cocharcas por tala de árboles. NOTA: La LT 66kV Cocharcas -Hualte es radial. El bloqueo de reconexión se realizará de forma intermitente según el requerimiento en terreno.	07/01/2016	08:00	07/01/2016	18:00	07/01/2016	09:14	07/01/2016	18:19
SD47571/2015	cge	Subestación : HUALTE_____033 Linea : HUALTE_____033 - QUIRIHUE_____033 Tramo : HUALTE_____033 - QUIRIHUE_____033 Intervención / Programada Ningún Consumo Afectado	Intervencion	Programada	Bloquear reconexión automática del interruptor 52FT1 de S/E Hualte por tala, poda y roce de árboles. NOTA: La LT 33kV Hualte - Quirihue es radial. El bloqueo de reconexión se realizará de forma intermitente según el requerimiento en terreno.	07/01/2016	08:00	07/01/2016	18:00	07/01/2016	09:14	07/01/2016	18:18
SD47630/2015	transelec	Subestacion :POLPAICO_____220 Otro Elemento :OTROS\n Elemento: Intervencion /Programada Comentario:Equipo:S/E Polpaico. Sistema SCADA. Tipo Trabajo:Trabajos varios Descripción del Trabajo S/E Polpaico: Normalización de señales de alarmas hacia SCADA en SICAM Polpaico. Restricciones:Normalización sujeta a coordinación Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas S/E Polpaico: Señalización de la zona de trabajo. Se perderán los datos de SCADA Polpaico 500 kV por un tiempo no mayor a 5 minutos. Instalaciones con riesgo S/E Polpaico: Sistema SCADA. Observaciones No hay. Ningun Consumo Afectado Fecha Inicio:2016-01-07 Hora de Inicio:09:00 Fecha Termino:2016-01-07 Hora de Termino:17:00 Solicita intervención:ADELVALLETrabajo a realizar: Otro Tipo de Trabajo	Intervencion	Programada	Equipo:S/E Polpaico. Sistema SCADA. Tipo Trabajo:Trabajos varios Descripción del Trabajo S/E Polpaico: Normalización de señales de alarmas hacia SCADA en SICAM Polpaico. Restricciones:Normalización sujeta a coordinación Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas S/E Polpaico: Señalización de la zona de trabajo. Se perderán los datos de SCADA Polpaico 500 kV por un tiempo no mayor a 5 minutos. Instalaciones con riesgo S/E Polpaico: Sistema SCADA. Observaciones No hay.	07/01/2016	09:00	07/01/2016	17:00	07/01/2016	10:40	07/01/2016	13:00

Nro.	Empresa	Resumen	Tipo	Cuando	Objetivo	Fec.Ini.Prg	Hora Ini.Prg	Fec.Ter.Prg	Hora Ter.Prg	Fec.Ini.Efec	Hora Ini.Efec	Fec.Ter.Efec	Hora Ter.Efec
SD47701/2015	transelec	Subestacion :LA_CEBADA_____220 Linea :LA_CEBADA_____220 - P.AZUCAR_____220\n Tramo: LA_CEBADA_____220 - P.AZUCAR_____220 Intervencion /Programada Comentario:Equipo:L. 220 kV LA CEBADA - PAN DE AZÚCAR Tipo Trabajo:Mantenimiento de Líneas Descripción del Trabajo Reemplazo cable de guardia, entre estructuras 544 y 558. Sodi N° 43. Restricciones:Restriccion a la reconexion Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas No reconectar interruptores asociados a Línea 220 K La Cebada-Pan de Azúcar. Instalaciones con riesgo LÍNEA 220 KV LA CEBADA - PAN DE AZÚCAR Observaciones No Hay Ningun Consumo Afectado Fecha Inicio:2016-01-07 Hora de Inicio:07:00 Fecha Termino:2016-01-07 Hora de Termino:18:00 Solicita intervención:ADELVALLETrabajo a realizar: Otro Tipo de Trabajo	Intervencion	Programada	Equipo:L. 220 kV LA CEBADA - PAN DE AZÚCAR Tipo Trabajo:Mantenimiento de Líneas Descripción del Trabajo Reemplazo cable de guardia, entre estructuras 544 y 558. Sodi N° 43. Restricciones:Restriccion a la reconexion Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas No reconectar interruptores asociados a Línea 220 K La Cebada-Pan de Azúcar. Instalaciones con riesgo LÍNEA 220 KV LA CEBADA - PAN DE AZÚCAR Observaciones No Hay	07/01/2016	07:00	07/01/2016	18:00	07/01/2016	08:33	07/01/2016	20:08
SD47708/2015	transelec	Subestacion :PUNTA_COLORADA___220 Linea :PUNTA_COLORADA___220 - MAITENCILLO___220 CTO1\n Tramo: PUNTA_COLORADA___220 - MAITENCILLO___220 CTO1 Intervencion /Programada Comentario:Equipo:L. 2X220 KV P. COLORADA - MAI, C 1 Tipo Trabajo:Lavado de Aislación Descripción del Trabajo Lavado cadenas de aislación con línea energizada, estructuras 465 a 524. Restricciones:Restriccion a la reconexion Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas No reconectar interruptores asociados a la L. 220 kV Punta Colorada - Maitencillo C1 Instalaciones con riesgo LÍNEA 220 kV PUNTA COLORADA - MAITENCILLO, C1 Observaciones NO HAY Ningun Consumo Afectado Fecha Inicio:2016-01-07 Hora de Inicio:07:00 Fecha Termino:2016-01-07 Hora de Termino:18:00 Solicita intervención:ADELVALLETrabajo a realizar: Lavado de Aislación	Intervencion	Programada	Equipo:L. 2X220 KV P. COLORADA - MAI, C 1 Tipo Trabajo:Lavado de Aislación Descripción del Trabajo Lavado cadenas de aislación con línea energizada, estructuras 465 a 524. Restricciones:Restriccion a la reconexion Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas No reconectar interruptores asociados a la L. 220 kV Punta Colorada - Maitencillo C1 Instalaciones con riesgo LÍNEA 220 kV PUNTA COLORADA - MAITENCILLO, C1 Observaciones NO HAY	07/01/2016	07:00	07/01/2016	18:00	07/01/2016	08:33	07/01/2016	16:25

Nro.	Empresa	Resumen	Tipo	Cuando	Objetivo	Fec.Ini.Prg	Hora Ini.Prg	Fec.Ter.Prg	Hora Ter.Prg	Fec.Ini.Efec	Hora Ini.Efec	Fec.Ter.Efec	Hora Ter.Efec
SD47711/2015	transelec	Subestacion :PUNTA_COLORADA___220 Linea :PUNTA_COLORADA___220 - MAITENCILLO___220 CTO2\n Tramo: PUNTA_COLORADA___220 - MAITENCILLO___220 CTO2 Intervencion /Programada Comentario:Equipo:L. 2X220 KV P. COLORADA - MAI, C 2 Tipo Trabajo:Lavado de Aislación Descripción del Trabajo Lavado cadenas de aislación con línea energizada, estructuras 465 a 524. Restricciones:Restriccion a la reconexion Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas No reconectar interruptores asociados a la L. 220 kV Punta Colorada - Maitencillo C2 Instalaciones con riesgo LÍNEA 220 kV PUNTA COLORADA - MAITENCILLO, C2 Observaciones NO HAY Ningun Consumo Afectado Fecha Inicio:2016-01-07 Hora de Inicio:07:00 Fecha Termino:2016-01-07 Hora de Termino:18:00 Solicita intervención:ADELVALLETrabajo a realizar: Lavado de Aislación	Intervencion	Programada	Equipo:L. 2X220 KV P. COLORADA - MAI, C 2 Tipo Trabajo:Lavado de Aislación Descripción del Trabajo Lavado cadenas de aislación con línea energizada, estructuras 465 a 524. Restricciones:Restriccion a la reconexion Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas No reconectar interruptores asociados a la L. 220 kV Punta Colorada - Maitencillo C2 Instalaciones con riesgo LÍNEA 220 kV PUNTA COLORADA - MAITENCILLO, C2 Observaciones NO HAY	07/01/2016	07:00	07/01/2016	18:00	07/01/2016	08:33	07/01/2016	16:25
SD47712/2015	transelec	Subestacion :C.PINTO_____220 Linea :C.PINTO_____220 - D.ALMAGRO_____220\n Tramo: Intervencion /Programada Comentario:Equipo:L. 220 KV C PINTO - D.D.A. Tipo Trabajo:Lavado de Aislación Descripción del Trabajo Lavado de aislación, estructuras 651 a 670 y 770 a 777. Restricciones:Restriccion a la reconexion Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas No reconectar interruptores asociados a la línea 220 kV. Carrera Pinto Diego de Almagro Instalaciones con riesgo LÍNEA 220 kV CARRERA PINTO - DIEGO DE ALMAGRO Observaciones No hay Ningun Consumo Afectado Fecha Inicio:2016-01-07 Hora de Inicio:07:00 Fecha Termino:2016-01-07 Hora de Termino:18:00 Solicita intervención:ADELVALLETrabajo a realizar: Lavado de Aislación	Intervencion	Programada	Equipo:L. 220 KV C PINTO - D.D.A. Tipo Trabajo:Lavado de Aislación Descripción del Trabajo Lavado de aislación, estructuras 651 a 670 y 770 a 777. Restricciones:Restriccion a la reconexion Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas No reconectar interruptores asociados a la línea 220 kV. Carrera Pinto Diego de Almagro Instalaciones con riesgo LÍNEA 220 kV CARRERA PINTO - DIEGO DE ALMAGRO Observaciones No hay	07/01/2016	07:00	07/01/2016	18:00	07/01/2016	08:33	07/01/2016	14:56

Nro.	Empresa	Resumen	Tipo	Cuando	Objetivo	Fec.Ini.Prg	Hora Ini.Prg	Fec.Ter.Prg	Hora Ter.Prg	Fec.Ini.Efec	Hora Ini.Efec	Fec.Ter.Efec	Hora Ter.Efec
SD47715/2015	transelec	Subestacion :DON_GOYO_____220 Linea :DON_GOYO_____220 - P.AZÚCAR_____220\n Tramo: DON_GOYO_____220 - P.AZÚCAR_____220 Intervencion /Programada Comentario:Equipo:L. 220 kV DON GOYO - PAN DE AZÚCAR Tipo Trabajo:Mantenimiento de Líneas Descripción del Trabajo Reemplazo cable de guardia, entre estructuras 544 y 558. Sodi N° 50. Restricciones:Restriccion a la reconexion Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas No recnectar interruptores asociados a Línea 220 KV Don Goyo - Pan de Azúcar. Instalaciones con riesgo LÍNEA 220 KV DON GOYO - PAN DE AZUCAR Observaciones No Hay. Ningun Consumo Afectado Fecha Inicio:2016-01-07 Hora de Inicio:07:00 Fecha Termino:2016-01-07 Hora de Termino:18:00 Solicita intervención:ADELVALLETrabajo a realizar: Otro Tipo de Trabajo	Intervencion	Programada	Equipo:L. 220 kV DON GOYO - PAN DE AZÚCAR Tipo Trabajo:Mantenimiento de Líneas Descripción del Trabajo Reemplazo cable de guardia, entre estructuras 544 y 558. Sodi N° 50. Restricciones:Restriccion a la reconexion Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas No recnectar interruptores asociados a Línea 220 KV Don Goyo - Pan de Azúcar. Instalaciones con riesgo LÍNEA 220 KV DON GOYO - PAN DE AZUCAR Observaciones No Hay.	07/01/2016	07:00	07/01/2016	18:00	07/01/2016	08:33	07/01/2016	20:08
SD47869/2015	transelec	Subestacion :DOS AMIGOS____110 Otro Elemento :OTROS\n Elemento: Intervencion /Programada Comentario:Equipo:BANCO CCEE1-DAM Tipo Trabajo:Verificación y/o calibracion de protecc Descripción del Trabajo VERIFICACIÓN Y MEDIDA DE AISLACIÓN REGULADOR DE TENSION BANCO CCEE. Restricciones:Instalación limitada Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas BLOQUEO DE COMANDO DE REGULACION Instalaciones con riesgo BARRA 23 KV - DOS AMIGOS Observaciones No hay. Ningun Consumo Afectado Fecha Inicio:2016-01-07 Hora de Inicio:10:00 Fecha Termino:2016-01-07 Hora de Termino:16:00 Solicita intervención:ADELVALLETrabajo a realizar: Otro Tipo de Trabajo	Intervencion	Programada	Equipo:BANCO CCEE1-DAM Tipo Trabajo:Verificación y/o calibracion de protecc Descripción del Trabajo VERIFICACIÓN Y MEDIDA DE AISLACIÓN REGULADOR DE TENSION BANCO CCEE. Restricciones:Instalación limitada Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas BLOQUEO DE COMANDO DE REGULACION Instalaciones con riesgo BARRA 23 KV - DOS AMIGOS Observaciones No hay.	07/01/2016	10:00	07/01/2016	16:00	07/01/2016	08:33	07/01/2016	16:38

Nro.	Empresa	Resumen	Tipo	Cuando	Objetivo	Fec.Ini.Prg	Hora Ini.Prg	Fec.Ter.Prg	Hora Ter.Prg	Fec.Ini.Efec	Hora Ini.Efec	Fec.Ter.Efec	Hora Ter.Efec
SD47871/2015	transelec	Subestacion :DOS AMIGOS____110 Otro Elemento :OTROS\n Elemento: Intervencion /Programada Comentario:Equipo:BANCO CCEE2-DAM Tipo Trabajo:Verificación y/o calibracion de protecc Descripción del Trabajo VERIFICACIÓN Y MEDIDA DE AISLACIÓN REGULADOR DE TENSIÓN BANCO CCEE. Restricciones:Instalación limitada Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas BLOQUEO DE COMANDO DE REGULACION Instalaciones con riesgo BARRA 23 KV - DOS AMIGOS Observaciones No hay Ningun Consumo Afectado Fecha Inicio:2016-01-07 Hora de Inicio:10:00 Fecha Termino:2016-01-07 Hora de Termino:16:00 Solicita intervención:ADELVALLETrabajo a realizar: Otro Tipo de Trabajo	Intervencion	Programada	Equipo:BANCO CCEE2-DAM Tipo Trabajo:Verificación y/o calibracion de protecc Descripción del Trabajo VERIFICACIÓN Y MEDIDA DE AISLACIÓN REGULADOR DE TENSIÓN BANCO CCEE. Restricciones:Instalación limitada Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas BLOQUEO DE COMANDO DE REGULACION Instalaciones con riesgo BARRA 23 KV - DOS AMIGOS Observaciones No hay	07/01/2016	10:00	07/01/2016	16:00	07/01/2016	08:33	07/01/2016	16:38
SD47877/2015	cge	Subestación : MARBELLA_____110 Linea : QUILLOTA_____110 - QUINQUIMO_____110 (con Marbella) Tramo : MARBELLA_____110 - C.VIEJAS_____110 Tramo : C.VIEJAS_____110 - QUINQUIMO_____110 Intervención / Programada Ningún Consumo Afectado	Intervencion	Programada	Roce y pode franja servidumbre / Con Bloqueo a la reconexión. Se considera el bloqueo de la reconexión automática del interruptor 52H1 de S/E Marbella, línea hacia Quinquimo.	07/01/2016	08:00	07/01/2016	18:00	07/01/2016	08:34	07/01/2016	17:48
SD47879/2015	cge	Subestación : COLLIPULLI____066 Otro Elemento de Subestación : OTROS N ° : Desconexión / Programada Ningún Consumo Afectado	Desconexion	Programada	Desconexión de interruptor 52B2 de S/E Collipulli por faenas de reemplazo antiguo equipo Delle por nueva unidad Alstom GL309. Lo anterior contemplado dentro de Programa de Mantenimiento Mayor. Interruptor 52B2 de SE Collipulli opera en condición normalmente abierto, por lo que no hay interrupción de suministro.	07/01/2016	07:00	08/01/2016	20:00	07/01/2016	06:43	08/01/2016	16:27
SD47884/2015	hlh	Central : LA HIGUERA / Unidad : U1 / Potencia Disponible : 0.0 MW Desconexión / Origen Interno / Programada Ningún Consumo Afectado	Desconexion	Programada	Cambio sello eje e inspección programada Turbina.	07/01/2016	00:00	09/01/2016	23:59	07/01/2016	02:45	09/01/2016	19:02
SD47924/2015	sts	Central : DEGAN / Unidad : U1 / Potencia Disponible : 25 MW Intervención / Programada Ningún Consumo Afectado	Intervencion	Programada	Central Degan por pruebas de control y regulación y carga de equipos, solicita hacer pruebas con carga con la central de 0 a 30 MW.	07/01/2016	09:00	07/01/2016	18:00	07/01/2016	09:00	07/01/2016	22:24

Nro.	Empresa	Resumen	Tipo	Cuando	Objetivo	Fec.Ini.Prg	Hora Ini.Prg	Fec.Ter.Prg	Hora Ter.Prg	Fec.Ini.Efec	Hora Ini.Efec	Fec.Ter.Efec	Hora Ter.Efec
SD47929/2015	cge	Subestación : CURANILAHUE___066 Linea : HORCONES_____066 - LEBU_____066 Tramo : CURANILAHUE___066 - T.PINOS_____066 Intervención / Programada Ningún Consumo Afectado	Intervencion	Programada	Se realizará una poda y tala de árboles cercanos a la línea LT 66 kV Curanilahue-Tres Pinos, por tal motivo se requiere el bloqueo de reconexión del 52B1 de S/E Curanilahue. El bloqueo solicitado, se realizará en forma paulatina y efectiva en el período correspondiente al inicio y término de los trabajos en las cercanías de la línea.	07/01/2016	08:00	07/01/2016	18:00	07/01/2016	09:12	07/01/2016	17:10
SD47931/2015	sts	Subestación : PIDPID_____110 Otro Elemento de Subestación : SISTEMA SCADA N ° : SISTEMA SCADA Intervención / Programada Ningún Consumo Afectado	Intervencion	Programada	reprogramación de RTU en SE Pid Pid por integración de nuevo paño 52H2 próximo a ser energizado. puede que se pierda la comunicación por un lapso no mayor a 5 minutos.	07/01/2016	12:00	07/01/2016	20:00	07/01/2016	16:06	07/01/2016	19:18
SD47943/2015	cge	Subestación : VILLARICA_____066 Linea : VILLARRICA____066 - PUCON_____066 Tramo : VILLARRICA____066 - PUCON_____066 NO Genera Indisponibilidad Intervención / Programada Ningún Consumo Afectado	Intervencion	Programada	Precaución operacional a línea 66 kV Villarrica-Pucon (Sin reconexión 52B2 de SE Villarrica y No reconectar 52BT de SE Pucon) a solicitud de CGE Distribución (sodi 04) por trabajos de poda de árboles cercanos a línea de media tensión de su propiedad en postación comun con línea 66 kV	07/01/2016	09:00	07/01/2016	18:00	07/01/2016	08:43	07/01/2016	18:25
SD47979/2015	codelco	Subestación : EL_COBRE_____110 (Teniente) Linea : MINERO_____110 - EL_COBRE_____110 CTO1 Tramo : MINERO_____110 - EL_COBRE_____110 CTO1 Desconexión / Programada Ningún Consumo Afectado	Desconexion	Programada	Por trabajos de revisión componentes del banco de condensadores de S/E Minero, se solicita la desconexión del paño H10 de Minero, próximo al lugar de intervención.	07/01/2016	08:00	07/01/2016	16:00	07/01/2016	08:21	07/01/2016	21:21

Nro.	Empresa	Resumen	Tipo	Cuando	Objetivo	Fec.Ini.Prg	Hora Ini.Prg	Fec.Ter.Prg	Hora Ter.Prg	Fec.Ini.Efec	Hora Ini.Efec	Fec.Ter.Efec	Hora Ter.Efec
SD00018/2016	transelec	Subestacion :QUILLOTA_____220 Linea :QUILLOTA_____220 - PIUQUENES_____220 CTO2\n Tramo: Tramo: Tramo: Intervencion /Programada Comentario:Equipo:L. 220 kV Quillota - Piuquenes 2 Tipo Trabajo:Solicitado por Terceros Descripción del Trabajo Solicitud de Minera Los Pelambres para trabajos en el circuito 1 Restricciones:Restriccion a la reconexion Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas No Reconectar interruptores asociados a la línea de 220 kV Quillota - Piuquenes 2 Instalaciones con riesgo Línea de 220 kV Quillota - Piuquenes circuito 2. Observaciones No hay. Ningun Consumo Afectado Fecha Inicio:2016-01-07 Hora de Inicio:10:00 Fecha Termino:2016-01-07 Hora de Termino:16:00 Solicita intervención:CC-TRANSELECTrabajo a realizar: Otro Tipo de Trabajo	Intervencion	Programada	Equipo:L. 220 kV Quillota - Piuquenes 2 Tipo Trabajo:Solicitado por Terceros Descripción del Trabajo Solicitud de Minera Los Pelambres para trabajos en el circuito 1 Restricciones:Restriccion a la reconexion Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas No Reconectar interruptores asociados a la línea de 220 kV Quillota - Piuquenes 2 Instalaciones con riesgo Línea de 220 kV Quillota - Piuquenes circuito 2. Observaciones No hay.	07/01/2016	10:00	07/01/2016	16:00	07/01/2016	10:08	07/01/2016	13:16
SD00019/2016	transelec	Subestacion :QUILLOTA_____220 Linea :QUILLOTA_____220 - PIUQUENES_____220 CTO1\n Tramo: QUILLOTA_____220 - PIUQUENES_____220 CTO1 Desconexion /Programada Comentario:Equipo:Línea de 220 kV Quillota - Piuquenes 1 Tipo Trabajo:Solicitado por Terceros Descripción del Trabajo Solicitud de MLP para trabajos en sus instalaciones Restricciones:Equipo Indisponible Nivel Riesgo:Bajo Prueba Exp.:Sin prueba Experimental Bloqueo del Jefe de Faenas Puestas a tierra en las estructuras a intervenir Instalaciones con Riesgo L.220 kV Quillota - Piuquenes 2 Observaciones No hay Ningun Consumo Afectado Fecha Inicio:2016-01-07 Hora de Inicio:10:00 Fecha Termino:2016-01-07 Hora de Termino:16:00 Solicita intervención:CC-TRANSELECTrabajo a realizar: Otro Tipo de Trabajo	Desconexion	Programada	Equipo:Línea de 220 kV Quillota - Piuquenes 1 Tipo Trabajo:Solicitado por Terceros Descripción del Trabajo Solicitud de MLP para trabajos en sus instalaciones Restricciones:Equipo Indisponible Nivel Riesgo:Bajo Prueba Exp.:Sin prueba Experimental Bloqueo del Jefe de Faenas Puestas a tierra en las estructuras a intervenir Instalaciones con Riesgo L.220 kV Quillota - Piuquenes 2 Observaciones No hay	07/01/2016	10:00	07/01/2016	16:00	07/01/2016	10:08	07/01/2016	13:16

Nro.	Empresa	Resumen	Tipo	Cuando	Objetivo	Fec.Ini.Prg	Hora Ini.Prg	Fec.Ter.Prg	Hora Ter.Prg	Fec.Ini.Efec	Hora Ini.Efec	Fec.Ter.Efec	Hora Ter.Efec
SD00023/2016	transelec	Subestacion :PEHUENCHE_____220 Linea :PEHUENCHE - CANAL MELADO - ANCOA_____220 CTO1\n Tramo: TAP_CANAL_MELADO___220 - ANCOA_____220 Tramo: PEHUENCHE_____220 - TAP_CANAL_MELADO___220 Tramo: CANAL_MELADO_____220 - TAP_CANAL_MELADO___220 Intervencion /Programada Comentario:Equipo:S/E PEHUENCHE: Paño J1 L. Ancoa 1 Tipo Trabajo:Investigar o Reparar Anormalidad Descripción del Trabajo S/E PEHUENCHE: VERIFICACIÓN DE OPERACIÓN PROTECCIÓN 21/21N SISTEMA 2, MARCA SIEMENS 7SA612 Restricciones:Normalización sujeta a coordinación Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas S/E PEHUENCHE: DELIMITACIÓN Y SEÑALIZACIÓN ZONA DE TRABAJO Instalaciones con riesgo LÍNEA 220KV PEHUENCHE- CANAL MELADO-ANCOA 1 Observaciones S/E PEHUENCHE: MANTENIMIENTO CORRECTIVO DE SISTEMA DE CONTROL Ningun Consumo Afectado Fecha Inicio:2016-01-07 Hora de Inicio:10:00 Fecha Termino:2016-01-07 Hora de Termino:16:30 Solicita intervención:ADELVALLETrabajo a realizar: Otro Tipo de Trabajo	Intervencion	Programada	Equipo:S/E PEHUENCHE: Paño J1 L. Ancoa 1 Tipo Trabajo:Investigar o Reparar Anormalidad Descripción del Trabajo S/E PEHUENCHE: VERIFICACIÓN DE OPERACIÓN PROTECCIÓN 21/21N SISTEMA 2, MARCA SIEMENS 7SA612 Restricciones:Normalización sujeta a coordinación Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas S/E PEHUENCHE: DELIMITACIÓN Y SEÑALIZACIÓN ZONA DE TRABAJO Instalaciones con riesgo LÍNEA 220KV PEHUENCHE- CANAL MELADO-ANCOA 1 Observaciones S/E PEHUENCHE: MANTENIMIENTO CORRECTIVO DE SISTEMA DE CONTROL	07/01/2016	10:00	07/01/2016	16:30	07/01/2016	15:30	07/01/2016	18:56
SD00089/2016	colbun	Subestacion :MINERO________110Otro Elemento :OTROSElemento: Desconexion /ProgramadaComentario:Codelco solicita maniobras en paño H10 de S/E Minero, por desconexión de línea 110 kV Minero-El Cobre N°1. Motivo: En S/E Minero: Inspección de herrajes de desconectadores del nuevo paño de Banco CC.EE.Ningun Consumo AfectadoFecha Inicio:2016-01-07Hora de Inicio:08:00Fecha Termino:2016-01-07Hora de Termino:16:00Solicita intervención:COLBUN\JArancibiaTrabajo a realizar: Otro Tipo de Trabajo	Desconexion	Programada	Codelco solicita maniobras en paño H10 de S/E Minero, por desconexión de línea 110 kV Minero-El Cobre N°1. Motivo: En S/E Minero: Inspección de herrajes de desconectadores del nuevo paño de Banco CC.EE.	07/01/2016	08:00	07/01/2016	16:00	07/01/2016	08:37	07/01/2016	21:21

Nro.	Empresa	Resumen	Tipo	Cuando	Objetivo	Fec.Ini.Prg	Hora Ini.Prg	Fec.Ter.Prg	Hora Ter.Prg	Fec.Ini.Efec	Hora Ini.Efec	Fec.Ter.Efec	Hora Ter.Efec
SD00090/2016	colbun	Subestacion :MINERO_____110Otro Elemento :SECCION DE BARRAElemento: SECCION 1 Desconexion /ProgramadaComentario:Codelco solicita desconexión de barra N°1-110kV de S/E Minero (Transferencia de consumos a barra N°2-110kV). Por trabajo propio de Codelco: Inspección de herrajes de futuro banco de condensadores 110kV de S/E MineroNingun Consumo AfectadoFecha Inicio:2016-01-07Hora de Inicio:08:00Fecha Termino:2016-01-07Hora de Termino:11:30Solicita intervención:COLBUN\JArancibiaTrabajo a realizar: Otro Tipo de Trabajo	Desconexion	Programada	Codelco solicita desconexión de barra N°1-110kV de S/E Minero (Transferencia de consumos a barra N°2-110kV). Por trabajo propio de Codelco: Inspección de herrajes de futuro banco de condensadores 110kV de S/E Minero	07/01/2016	08:00	07/01/2016	11:30	07/01/2016	11:10	07/01/2016	17:30
SD00097/2016	colbun	Subestacion :MINERO_____110Otro Elemento :SECCION DE BARRAElemento: SECCION 2 Desconexion /ProgramadaComentario:Codelco solicita desconexión de barra N°2-110kV de S/E Minero (Transferencia de consumos a barra N°1-110kV). Por trabajo propio de Codelco: Inspección de herrajes de futuro banco de condensadores 110kV de S/E MineroNingun Consumo AfectadoFecha Inicio:2016-01-07Hora de Inicio:13:00Fecha Termino:2016-01-07Hora de Termino:16:00Solicita intervención:COLBUN\JArancibiaTrabajo a realizar: Otro Tipo de Trabajo	Desconexion	Programada	Codelco solicita desconexión de barra N°2-110kV de S/E Minero (Transferencia de consumos a barra N°1-110kV). Por trabajo propio de Codelco: Inspección de herrajes de futuro banco de condensadores 110kV de S/E Minero	07/01/2016	13:00	07/01/2016	16:00	07/01/2016	17:30	07/01/2016	20:58
SD00159/2016	chilectra	Subestación : FLORIDA_____110 Linea : FLORIDA_____110 - A.JAHUEL_____110 CTO1 Tramo : BUIN.CHILEC___110 - TORRE1_____110 CTO1 Tramo : A.JAHUEL_____110 - TORRE1_____110 CTO1 Tramo : TORRE1_____110 - L.PINTANA_____110 CTO1 Tramo : L.PINTANA_____110 - TAP_MARISCAL___110 CTO1 Tramo : TAP_MARISCAL___110 - MARISCAL_____110 CTO1 Tramo : TAP_MARISCAL___110 - S.ROSA_____110 CTO1 Tramo : S.ROSA_____110 - S.RAQUEL_____110 CTO1 Tramo : S.RAQUEL_____110 - FLORIDA_____110 CTO1 Intervención / Programada Ningún Consumo Afectado	Intervencion	Programada	Restricción de reconexión del circuito en subestación Florida a solicitud de Transelec	07/01/2016	14:00	07/01/2016	17:00	07/01/2016	14:56	08/01/2016	08:35

Nro.	Empresa	Resumen	Tipo	Cuando	Objetivo	Fec.Ini.Prg	Hora Ini.Prg	Fec.Ter.Prg	Hora Ter.Prg	Fec.Ini.Efec	Hora Ini.Efec	Fec.Ter.Efec	Hora Ter.Efec
SD00186/2016	cge	Subestación : CHOAPA_____110 Linea : CHOAPA_____110 - QUINQUIMO_____110 Tramo : CHOAPA_____110 - QUINQUIMO_____110 NO Genera Indisponibilidad Intervención / Programada Ningún Consumo Afectado	Intervencion	Programada	Lavado de Aislación / Con Bloqueo a la reconexión. Se considera el bloqueo de la reconexión automática del 52H3 de S/E Choapa, interruptor de línea hacia Quínquimo.	07/01/2016	08:00	07/01/2016	18:00	07/01/2016	08:05	07/01/2016	19:12
SD00240/2016	cge	Subestación : COLLIPULLI____066 Otro Elemento de Subestación : OTROS N ° : Desconexión / Programada Ningún Consumo Afectado	Desconexion	Programada	Maniobras de apertura desconectador 89B3 de SE Collipulli (arranque 66 kV Collipulli-FFCC Collipulli) por trabajos de Transnet en la mencionada subestación. Desconexión coordinada con EFE. Consumos respaldados a través de red EFE.	07/01/2016	08:00	07/01/2016	14:00	07/01/2016	08:30	07/01/2016	15:02
SD00258/2016	chilquinta	Central : TECNORED / Unidad : C. TOTORAL / Potencia Disponible : 3 MW Intervención / Programada Ningún Consumo Afectado	Intervencion	Programada	Pruebas con carga	07/01/2016	10:00	07/01/2016	11:00	07/01/2016	10:23	07/01/2016	15:55
SD00260/2016	colbun	Central :LOS QUILOS/Unidad : U3/Potencia :12,5Intervencion /Origen Interno/ProgramadaComentario:Limpieza de Pozo de Refrigeración de la U3 de la CH Los QuilosNingun Consumo AfectadoFecha Inicio:2016-01-07Hora de Inicio:08:00Fecha Termino:2016-01-07Hora de Termino:18:00Solicita intervención:COLBUN\DsolerTrabajo a realizar: Otro Tipo de Trabajo	Intervencion	Programada	Limpieza de Pozo de Refrigeración de la U3 de la CH Los Quilos	07/01/2016	08:00	07/01/2016	18:00	07/01/2016	10:11	07/01/2016	17:33
SD00261/2016	colbun	Central :NEHUENCO I/Unidad : Central Completa/Potencia :330Intervencion /Origen Interno/ProgramadaComentario:Inspección de válvula de control de nivel domo MP : Ajuste de posición del actuador y apriete de prensa.Ningun Consumo AfectadoFecha Inicio:2016-01-07Hora de Inicio:08:00Fecha Termino:2016-01-07Hora de Termino:18:00Solicita intervención:COLBUN\DsolerTrabajo a realizar: Otro Tipo de Trabajo	Intervencion	Programada	Inspección de válvula de control de nivel domo MP : Ajuste de posición del actuador y apriete de prensa.	07/01/2016	08:00	07/01/2016	18:00	07/01/2016	08:42	08/01/2016	17:55
SD00282/2016	celeoredes	Subestación : A.JAHUEL_____500 Linea : ANCOA_____500 - A.JAHUEL_____500 CTO3 Tramo : ANCOA_____500 - A.JAHUEL_____500 CTO3 NO Genera Indisponibilidad Intervención / Programada Ningún Consumo Afectado	Intervencion	Programada	Precaución operacional por trabajos de modificación de tendido de conductor del circuito 4.	07/01/2016	07:30	07/01/2016	19:00	07/01/2016	07:44	07/01/2016	19:04
SD00288/2016	metro	Subestación : METRO_____110 Transformador: Transf. TR1 110/20 kV - 40/60 MVA S/E METRO Desconexión / Programada Ningún Consumo Afectado	Desconexion	Programada	Conexión de máquina para tratamiento de aceite y cambio de aceite al cambiador de taps. Se solicita TR1 ,fuera de servicio.	07/01/2016	00:20	07/01/2016	04:00	07/01/2016	00:27	07/01/2016	04:27

Nro.	Empresa	Resumen	Tipo	Cuando	Objetivo	Fec.Ini.Prg	Hora Ini.Prg	Fec.Ter.Prg	Hora Ter.Prg	Fec.Ini.Efec	Hora Ini.Efec	Fec.Ter.Efec	Hora Ter.Efec
SD00292/2016	cge	Subestación : CAUQUENES_____066 Linea : CAUQUENES_____066 - LA_VEGA_______066 Tramo : CAUQUENES_____066 - LA_VEGA_______066 Intervención / Programada Ningún Consumo Afectado	Intervencion	Programada	A solicitud de CGED, de acuerdo a SODI N°13/2016, se requiere el bloqueo de reconexión del interruptor 52B1 en SE Cauquenes, por trabajos en sus instalaciones.	07/01/2016	10:00	07/01/2016	16:00	07/01/2016	10:14	07/01/2016	15:36
SD00300/2016	enlasa	Central : PEÑÓN / Unidad : Nave 2 / Potencia Disponible : 80.00 MW Intervención / Programada Ningún Consumo Afectado	Intervencion	Programada	Se solicita conexión con 2 MW para realizar pruebas de comunicación y sincronismo de equipo 206	07/01/2016	09:00	07/01/2016	20:00	07/01/2016	09:11	07/01/2016	12:11
SD00301/2016	colbun	Subestacion :STA_MARIA_____220Linea :STA_MARIA_____220 - CHARRUA_______220 CTO1Tramo: STA_MARIA_____220 - CHARRUA_______220 CTO1 Intervencion /ProgramadaComentario:Se realizará la verificación de comunicación y el correcto envío de datos a sistema scada, en servidor Work Center. Ningun Consumo AfectadoFecha Inicio:2016-01-07Hora de Inicio:09:00Fecha Termino:2016-01-07Hora de Termino:17:00Solicita intervención:COLBUN\JArancibiaTrabajo a realizar: Otro Tipo de Trabajo	Intervencion	Programada	Se realizará la verificación de comunicación y el correcto envío de datos a sistema scada, en servidor Work Center.	07/01/2016	09:00	07/01/2016	17:00	07/01/2016	10:26	07/01/2016	12:36
SD00306/2016	transelec	Subestacion :ITAHUE________154 Otro Elemento :SISTEMA SCADA\n Elemento: SISTEMA SCADA Intervencion /Programada Comentario:Equipo:S/E ITAHUE: URT SICAM PATIO 220 kV Tipo Trabajo:Obras CAPEX Descripción del Trabajo S/E Itahue: Extracción de Base de datos del SICAM Itahue 220 kV, por proyecto fase 2 Restricciones:Telecontrol en posición local Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas S/E ITAHUE 220 kV: DELIMITACIÓN Y SEÑALIZACIÓN ZONA DE TRABAJO Instalaciones con riesgo SISTEMA SCADA S/E ITAHUE (pérdida de datos y telecontrol Patio 220 kV) Observaciones Extracción de base de datos de SICAM Itahue 220 kV, por proyecto fase 2 Ningun Consumo Afectado Fecha Inicio:2016-01-07 Hora de Inicio:08:00 Fecha Termino:2016-01-07 Hora de Termino:18:00 Solicita intervención:ADELVALLETrabajo a realizar: Otro Tipo de Trabajo	Intervencion	Programada	Equipo:S/E ITAHUE: URT SICAM PATIO 220 kV Tipo Trabajo:Obras CAPEX Descripción del Trabajo S/E Itahue: Extracción de Base de datos del SICAM Itahue 220 kV, por proyecto fase 2 Restricciones:Telecontrol en posición local Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas S/E ITAHUE 220 kV: DELIMITACIÓN Y SEÑALIZACIÓN ZONA DE TRABAJO Instalaciones con riesgo SISTEMA SCADA S/E ITAHUE (pérdida de datos y telecontrol Patio 220 kV) Observaciones Extracción de base de datos de SICAM Itahue 220 kV, por proyecto fase 2	07/01/2016	08:00	07/01/2016	18:00	07/01/2016	11:30	07/01/2016	13:06
SD00366/2016	arauco	Central : ARAUCO / Unidad : Central Completa / Potencia Disponible : 0.00 MW Intervención / Programada Ningún Consumo Afectado	Intervencion	Programada	Relleno de SF6 / Sin bloqueo a la reconexión 	07/01/2016	09:00	07/01/2016	18:00	07/01/2016	08:15	07/01/2016	17:14

Nro.	Empresa	Resumen	Tipo	Cuando	Objetivo	Fec.Ini.Prg	Hora Ini.Prg	Fec.Ter.Prg	Hora Ter.Prg	Fec.Ini.Efec	Hora Ini.Efec	Fec.Ter.Efec	Hora Ter.Efec
SD00316/2016	endesa	Central : CANELA II / Unidad : UNIDAD AEROGENERADORA / Potencia Disponible : 0.0 MW Desconexión / Origen Interno / Programada Ningún Consumo Afectado	Desconexion	Programada	Aerogenerador G05, Mantenimiento a generador, transformador, elevador, líneas de vida y engrases.	07/01/2016	08:00	07/01/2016	17:00	07/01/2016	09:33	07/01/2016	17:07
SD00318/2016	endesa	Central : CANELA II / Unidad : UNIDAD AEROGENERADORA / Potencia Disponible : 0.0 MW Desconexión / Origen Interno / Programada Ningún Consumo Afectado	Desconexion	Programada	Aerogenerador D01, Cambio de acumulador de nitrógeno pala 3.	07/01/2016	08:00	07/01/2016	17:00	07/01/2016	09:23	07/01/2016	17:07
SD00324/2016	chilectra	Subestación : RENCA_____110 Otro Elemento de Subestación : OTROS N ° : Desconexión / Programada Ningún Consumo Afectado	Desconexion	Programada	Desconexión barra 110 kV N°2 para retiro de puentes hacia paño interruptor 110 kV Generación Gas. Coordinado con mantenimiento mayor Central Nueva Renca	07/01/2016	00:00	07/01/2016	06:00	07/01/2016	00:12	07/01/2016	06:09
SD00330/2016	comasa	Central : LAUTARO COMASA / Unidad : CENTRAL COMPLETA / Potencia Disponible : 46 MW Intervención / Programada Ningún Consumo Afectado	Intervencion	Programada	Trabajos en lineas de comunicación por cambios de proveedor.quedando solo habilitada la comunicación con el cdecsic (por lo que dura la actividad) a través de teléfono celular.	07/01/2016	12:00	07/01/2016	14:00	07/01/2016	12:02	07/01/2016	14:45
SD00331/2016	cge	Subestación : MIRAFLORES____110 Transformador: Transf. HT3 110/13.6 kV - 15/25 MVA S/E MIRAFLORES Intervención / Programada Ningún Consumo Afectado	Intervencion	Programada	Obras Civiles / Con Bloqueo a la reconexión Orden de precaución sobre interruptor 52HT3 por trabajos de obras civiles en proximidad a redes energizadas.	07/01/2016	09:00	07/01/2016	17:00	07/01/2016	08:52	07/01/2016	18:10
SD00354/2016	panguip	Central : TALTAL (EÓLICO) / Unidad : Central Completa / Potencia Disponible : 0.0 MW Desconexión / Origen Interno / Programada Ningún Consumo Afectado	Desconexion	Programada	Prueba de sistema contra incendios en transformador de SSEE.	07/01/2016	09:00	07/01/2016	13:00	07/01/2016	09:38	07/01/2016	15:07
SD00391/2016	gener	Central : GUACOLDA / Unidad : U4 / Potencia Disponible : 152 MW Intervención / Programada Ningún Consumo Afectado	Intervencion	Programada	Unidad limitada a plena carga para realizar mediciones isocineticas.	07/01/2016	08:00	07/01/2016	20:00	07/01/2016	08:00	07/01/2016	20:41
SD00400/2016	sts	Central : SAN PEDRO EÓLICO / Unidad : UNIDAD AEROGENERADORA / Potencia Disponible : 0.0 MW Desconexión / Origen Interno / Programada Ningún Consumo Afectado	Desconexion	Programada	Desconexión del aerogenerador N° 1 por mantenimiento.	07/01/2016	08:00	07/01/2016	18:00	07/01/2016	08:00	07/01/2016	17:35
SD00406/2016	cge	Subestación : P.AZUCAR_____110 Linea : S.JOAQUIN__110 (CGE) - P.AZUCAR_____110 Tramo : S.JOAQUIN___110 (CGE) - P.AZUCAR_____110 Intervención / Programada Ningún Consumo Afectado	Intervencion	Programada	Lavado de Aislación / Con Bloqueo a la reconexión, intertuptor 52H6 de SE Pan de Azúcar.	07/01/2016	08:00	07/01/2016	18:00	07/01/2016	15:01	07/01/2016	19:12
SD00407/2016	cge	Subestación : P.AZUCAR_____066 Linea : P.AZUCAR_____066 - MARQUESA_____066 Tramo : P.AZUCAR_____066 - MARQUESA_____066 Intervención / Programada Ningún Consumo Afectado	Intervencion	Programada	Lavado de Aislación / Con Bloqueo a la reconexión de interruptor 52B5 de SE Pan de Azúcar.	07/01/2016	08:00	07/01/2016	18:00	07/01/2016	10:45	07/01/2016	19:12

Nro.	Empresa	Resumen	Tipo	Cuando	Objetivo	Fec.Ini.Prg	Hora Ini.Prg	Fec.Ter.Prg	Hora Ter.Prg	Fec.Ini.Efec	Hora Ini.Efec	Fec.Ter.Efec	Hora Ter.Efec
SD00410/2016	hidromaule	Subestación : LIRCAY_____066 Linea : LIRCAY_____066 - MAULE_____066 Tramo : LIRCAY_____066 - MAULE_____066 Intervención / Programada Ningún Consumo Afectado	Intervencion	Programada	Cambio conector curvo fase R salida desconectador 89B4-2, para eliminar punto caliente de acuerdo a ultima inspeccion termografica realizada, este trabajo se realizara con linea energizada, para lo anterior se debera realizar BY-PASS entre salida chicote desconectador y linea.	07/01/2016	08:00	07/01/2016	20:00	07/01/2016	09:54	07/01/2016	13:22
SD00595/2016	gener	Central : GUACOLDA / Unidad : U5 / Potencia Disponible : 60 MW Intervención / Curso Forzoso Ningún Consumo Afectado	Intervencion	Curso Forzoso	Realizar revisión al motor del calentador de aire de la caldera por ruido anormal, este equipo crítico para la unidad.	07/01/2016	07:05	07/01/2016	12:00	07/01/2016	07:06	07/01/2016	09:03
SD00596/2016	cge	Subestación : MAULE_____066 Linea : LIRCAY_____066 - MAULE_____066 Tramo : LIRCAY_____066 - MAULE_____066 Intervención / Curso Forzoso Ningún Consumo Afectado	Intervencion	Curso Forzoso	A solicitud de Hidromaule de acuerdo a SODI N°1/2016 se requiere orden de precaución no reconectar interruptor 52B2 en SE Maule asociado a la línea Maule - Lircay por trabajos en sus instalaciones.	07/01/2016	08:00	07/01/2016	20:00	07/01/2016	09:40	07/01/2016	13:20
SD00606/2016	gener	Central : GUACOLDA / Unidad : U5 / Potencia Disponible : 0.0 MW Desconexión / Origen Interno / Curso Forzoso Ningún Consumo Afectado	Desconexion	Curso Forzoso	Realizar reparación al motor del calentador de aire de la caldera por ruido anormal, este equipo crítico para la unidad.	07/01/2016	09:02	07/01/2016	18:00	07/01/2016	09:03	08/01/2016	02:02

Nro.	Empresa	Resumen	Tipo	Cuando	Objetivo	Fec.Ini.Prg	Hora Ini.Prg	Fec.Ter.Prg	Hora Ter.Prg	Fec.Ini.Efec	Hora Ini.Efec	Fec.Ter.Efec	Hora Ter.Efec
SD00614/2016	transelec	Subestacion :TINGUIRIRICA____154 Linea :L1 Tinguiririca?Rancagua?A.Jahuel\n Tramo: TINGUIRIRICA____154 - MALLOA_____154 CTO1 Tramo: MALLOA_____154 - QUINTA_TILCOCO_____154 CTO1 Tramo: QUINTA_TILCOCO_____154 - P.CORTES_____154 CTO1 Tramo: P.CORTES_____154 - RANCAGUA_____154 CTO1 Tramo: RANCAGUA_____154 - PAINE_____154 CTO1 Tramo: PAINE_____154 - A.JAHUEL_____154 CTO1 Intervencion /Curso Forzoso Comentario:Equipo:L. 154 kV TIN - RANCAGUA - A. JAHUEL 1 Tipo Trabajo:Trabajos en el circuito adyacente Descripción del Trabajo Reparación de conductor cortado por robo en circuito 2 Restricciones:Restriccion a la reconexion Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas No Reconectar Interruptores que sirven a la Línea de 154 kV Tinguiririca-Rancagua-Alto Jahuel 1 Instalaciones con riesgo L. 154 kV TIN - RANCAGUA - A. JAHUEL, Cto. 2 (en la normalización) Observaciones Reparación de conductor cortado en circuito 2 Ningun Consumo Afectado Fecha Inicio:2016-01-07 Hora de Inicio:08:00 Fecha Termino:2016-01-07 Hora de Termino:15:00 Solicita intervención:CC-TRANSELECTrabajo a realizar: Otro Tipo de Trabajo	Intervencion	Curso Forzoso	Equipo:L. 154 kV TIN - RANCAGUA - A. JAHUEL 1 Tipo Trabajo:Trabajos en el circuito adyacente Descripción del Trabajo Reparación de conductor cortado por robo en circuito 2 Restricciones:Restriccion a la reconexion Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas No Reconectar Interruptores que sirven a la Línea de 154 kV Tinguiririca-Rancagua-Alto Jahuel 1 Instalaciones con riesgo L. 154 kV TIN - RANCAGUA - A. JAHUEL, Cto. 2 (en la normalización) Observaciones Reparación de conductor cortado en circuito 2	07/01/2016	08:00	07/01/2016	15:00	07/01/2016	10:39	07/01/2016	21:05
SD00616/2016	cge	Subestación : HORCONES_____066 Linea : C.ARAUCO_____066 - HORCONES_____066 Tramo : C.ARAUCO_____066 - HORCONES_____066 Desconexión / Curso Forzoso Ningún Consumo Afectado	Desconexion	Curso Forzoso	A solicitud de Arauco Bioenergia de acuerdo a SODI N°001/2016 se requiere desconexión del interruptor 52B2 y DD/CC 89B2-1 y 89B2-2 Abiertos en S/E Horcones, asociado a la línea Horcones-C.Arauco por reparación de DD/CC en línea C. Arauco-Horcones en planta Arauco.	07/01/2016	10:40	07/01/2016	18:00	07/01/2016	11:06	07/01/2016	17:06
SD00620/2016	arauco	Subestación : C.ARAUCO_____066 Linea : C.ARAUCO_____066 - HORCONES_____066 Tramo : C.ARAUCO_____066 - HORCONES_____066 Desconexión / Curso Forzoso Ningún Consumo Afectado	Desconexion	Curso Forzoso	Se requiere la desconexión de la línea de 66 kV C.Arauco-Horcones para realizar la reparación del desconectador de línea 89BL2 en Central Arauco. Al momento de realizar la desconexión programada se detectó anormalidad que requiere reparación inmediata.	07/01/2016	11:00	07/01/2016	18:00	07/01/2016	11:05	07/01/2016	17:14

Nro.	Empresa	Resumen	Tipo	Cuando	Objetivo	Fec.Ini.Prg	Hora Ini.Prg	Fec.Ter.Prg	Hora Ter.Prg	Fec.Ini.Efec	Hora Ini.Efec	Fec.Ter.Efec	Hora Ter.Efec
SD00685/2016	cge	Subestación : MAULE_____066 Otro Elemento de Subestación : CONDENSADORES N ° : Bco1 CCEE 6 MVAr; Transf. T1 Maule 154/066/015 kV 60MVA Desconexión / Curso Forzoso Ningún Consumo Afectado	Desconexion	Curso Forzoso	Se debe abrir el interruptor 52CE1 del BBCC N°1 de S/E Maule, y su DDCC 89CE1, por punto caliente en mufa de salida (fase B) del Tranaformador N°1 hacia el DDCC 89CE1. Se programará su reparación.	07/01/2016	17:15	31/01/2016	20:30	07/01/2016	17:15	07/01/2016	17:15
SD00689/2016	transelec	Subestacion :TINGUIRIRICA____154 Linea :L2 Tinguiririca?Rancagua?A.Jahuel\n Tramo: TINGUIRIRICA____154 - MALLOA_____154 CTO2 Tramo: MALLOA_____154 - QUINTA_TILCOCO_____154 CTO2 Tramo: QUINTA_TILCOCO_____154 - P.CORTES_____154 CTO2 Tramo: P.CORTES_____154 - RANCAGUA_____154 CTO2 Tramo: RANCAGUA_____154 - PAINE_____154 CTO2 Tramo: PAINE_____154 - A.JAHUEL_____154 CTO2 Intervencion /Curso Forzoso Comentario:Equipo:L. 154 kV TIN - RANCAGUA - A. JAHUEL 2 Tipo Trabajo:Trabajos en el circuito adyacente Descripción del Trabajo Reparación de conductor cortado por robo en circuito 1 Restricciones:Restriccion a la reconexion Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas No Reconectar Interruptores que sirven a la Línea de 154 kV Tinguiririca-Rancagua-Alto Jahuel 2 Instalaciones con riesgo LÍNEA 154 kV TINGUIRIRICA - RANCAGUA - ALTO JAHUEL, C2 Observaciones Reparación de conductor cortado en circuito 1 Ningun Consumo Afectado Fecha Inicio:2016-01-07 Hora de Inicio:14:00 Fecha Termino:2016-01-07 Hora de Termino:20:00 Solicita intervención:CC-TRANSELECTrabajo a realizar: Otro Tipo de Trabajo	Intervencion	Curso Forzoso	Equipo:L. 154 kV TIN - RANCAGUA - A. JAHUEL 2 Tipo Trabajo:Trabajos en el circuito adyacente Descripción del Trabajo Reparación de conductor cortado por robo en circuito 1 Restricciones:Restriccion a la reconexion Nivel Riesgo:Bajo Bloqueo del Jefe de Faenas No Reconectar Interruptores que sirven a la Línea de 154 kV Tinguiririca-Rancagua-Alto Jahuel 2 Instalaciones con riesgo LÍNEA 154 kV TINGUIRIRICA - RANCAGUA - ALTO JAHUEL, C2 Observaciones Reparación de conductor cortado en circuito 1	07/01/2016	14:00	07/01/2016	20:00	07/01/2016	21:05	07/01/2016	21:05

ANEXO Nº 5

Informes de trabajos y fallas de instalaciones ingresados en el sistema CDEC por Transelec S.A., Transnet S.A., Cooperativa de Abastecimiento de Energía Eléctrica Curicó Ltda., Arauco Bioenergía S.A. e Hidroeléctrica La Higuera S.A.

INFORME DE FALLA - Nº IF00046/2016

Empresa : Transelec S.A.

Fecha : 07/01/2016

Hora : 23:31

Equipo Afectado :	**Tramo : TINGUIRIRICA____154 - MALLOA_____154 CTO1** **Tramo : MALLOA_____154 - QUINTA_TILCOCO_____154 CTO1** **Tramo : QUINTA_TILCOCO_____154 - P.CORTES_____154 CTO1** **Tramo : P.CORTES_____154 - RANCAGUA_____154 CTO1** **Tramo : RANCAGUA_____154 - PAINE_____154 CTO1** **Tramo : PAINE_____154 - A.JAHUEL_____154 CTO1**
Perturbación :	**Fecha:** 07/01/2016 **Hora Inicio:** 01:13 Empresa instalación afectada:Transelec S.A.
Zona Afectada :	Ninguna
Informe con causa reiterada	NO
Causa Presunta:	
Causa Definitiva:	**Código** **Descripción** 3009 Intervención fortuita **Detalle** Intervención fortuita de operación.
Observaciones:	A las 08:45 horas cerrado int. 52A2 previo a apertura de puentes en estructura N°342.
Acciones Inmediatas:	Informe al CDEC-SIC.
Acciones a Corto Plazo :	
Acciones a Largo Plazo :	
Consumo Afectado :	Consumo: Ninguno
Retorno :	**Estimado** **Fecha** **Hora** 07/01/2016 08:45
Reporta Falla:	JORGE PONCE IBAÑEZ

Efectivo (a servicio o disponibilidad completa)

Equipo Afectado	Fecha	Hora
Tramo : TINGUIRIRICA____154 - MALLOA_____154 CTO1	07/01/2016	01:45
Tramo : MALLOA_____154 - QUINTA_TILCOCO_____154 CTO1	07/01/2016	01:45
Tramo : QUINTA_TILCOCO_____154 - P.CORTES_____154 CTO1	07/01/2016	01:45
Tramo : P.CORTES_____154 - RANCAGUA_____154 CTO1	07/01/2016	01:45
Tramo : RANCAGUA_____154 - PAINE_____154 CTO1	07/01/2016	01:45
Tramo : PAINE_____154 - A.JAHUEL_____154 CTO1	07/01/2016	01:45

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INFORME DE FALLA - Nº IF00046/2016

Empresa : Transelec S.A.

Fecha : 07/01/2016

Hora : 23:31

Interruptores Operados, Actuación de Protecciones y Maniobras de Reposición:	Subestación	P.CORTES_____154
	Fecha	07/01/2016
	Hora	01:13
	Protección o Alarma Operada	
	Interruptor	52A2
	Fecha Normaliza	07/01/2016
	Hora Normaliza	08:45
	Consumo (MW)	
	Comentario	
Consumos Afectados		
Hechos Sucedidos		

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INFORME DE FALLA - Nº IF00035/2016

Empresa : TRANSNET

Fecha : 07/01/2016

Hora : 07:57

Equipo Afectado :	**S.V.TAGUATAGUA_066** **Transformador: Transf. BT2 66/15 kV - 15/25 MVA S/E S.V.TAGUATAGUA**
Perturbación :	**Fecha:** 07/01/2016 **Hora Inicio:** 01:13 Empresa instalación afectada:TRANSNET
Zona Afectada :	Septima region /
Comuna Origen de Falla :	San Vicente
Informe con causa reiterada	NO
Causa Presunta:	Se investiga.
Causa Definitiva:	
Observaciones:	Desconexión forzada por protecciones del interruptor 52BT2 S/E San Vicente Tagua Tagua, afectando los consumos asociados al transformador N°2.
Acciones Inmediatas:	Coordinación con el CDC del CDEC-SIC.
Acciones a Corto Plazo :	
Acciones a Largo Plazo :	
Consumo Afectado :	CGE Distribución / Perd. Estm. de Potencia: 5.32 MW / Region : SEXTA Faenadora Agrosuper / Perd. Estm. de Potencia: 7.54 MW / Region : SEXTA
Retorno :	**Estimado** **Fecha** 07/01/2016 **Hora** 03:11

Efectivo (a servicio o disponibilidad completa)

Equipo Afectado	Fecha	Hora
Transformador: Transf. BT2 66/15 kV - 15/25 MVA S/E S.V.TAGUATAGUA	07/01/2016	03:11

Reporta Falla:	Roberto Reyes Ramírez

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INFORME DE FALLA - Nº IF00035/2016

Empresa : TRANSNET

Fecha : 07/01/2016

Hora : 07:57

Interruptores Operados, Actuación de Protecciones y Maniobras de Reposición:	Subestación	S.V.TAGUATAGUA_066
	Fecha	07/01/2016
	Hora	01:13
	Protección o Alarma Operada	
	Interruptor	52BT2
	Fecha Normaliza	07/01/2016
	Hora Normaliza	03:11
	Consumo (MW)	14.43
	Comentario	
Consumos Afectados	Subestación	S.V.TAGUATAGUA_066
	Fecha	07/01/2016
	Hora	01:13
	Protección o Alarma Operada	
	Interruptor	52BT2
	Fecha Normaliza	07/01/2016
	Hora Normaliza	03:11
	Consumo (MW)	14.43
	Comentario	
Hechos Sucedidos		

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INFORME DE FALLA - Nº IF00038/2016

Empresa : TRANSNET

Fecha : 07/01/2016

Hora : 09:27

Equipo Afectado :	**ESQUEMA EDAC** **Otro Elemento de Subestacion : SISTEMA EDAC** **EDAC Baja Frecuencia**
Perturbación :	**Fecha:** 07/01/2016 **Hora Inicio:** 01:13 Empresa instalación afectada:TRANSNET
Zona Afectada :	Sexta region /
Comuna Origen de Falla :	Curicó
Informe con causa reiterada	NO
Causa Presunta:	Se investiga.
Causa Definitiva:	
Observaciones:	Operación por esquema EDAC, por falla externa a instalaciones de TRANSNET, afectando a las SS/EE Curicó, Rauquén y Teno.
Acciones Inmediatas:	Coordinación con el CDC del CDEC-SIC para el cierre de los circuitos.
Acciones a Corto Plazo :	
Acciones a Largo Plazo :	
Consumo Afectado :	CGE Distribución / Perd. Estm. de Potencia: 13.04 MW / Region : SEPTIMA FRONTEL / Perd. Estm. de Potencia: 0.06 MW / Region : SEPTIMA
Retorno :	**Estimado** **Fecha** 07/01/2016 **Hora** 08:30

Efectivo (a servicio o disponibilidad completa)

Equipo Afectado	Fecha	Hora
EDAC Baja Frecuencia	07/01/2016	08:30

Reporta Falla:	Roberto Reyes Ramírez

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INFORME DE FALLA - Nº IF00038/2016

Empresa : TRANSNET

Fecha : 07/01/2016

Hora : 09:27

Interruptores Operados, Actuación de Protecciones y Maniobras de Reposición:

Subestación	CURICO_____066
Fecha	07/01/2016
Hora	01:13
Protección o Alarma Operada	
Interruptor	52C3
Fecha Normaliza	07/01/2016
Hora Normaliza	01:26
Consumo (MW)	2.31
Comentario	Circuito Rucatremo.
Subestación	CURICO_____066
Fecha	07/01/2016
Hora	01:13
Protección o Alarma Operada	
Interruptor	52C5
Fecha Normaliza	07/01/2016
Hora Normaliza	01:27
Consumo (MW)	1.83
Comentario	Circuito Aguas Negras.
Subestación	RAUQUEN_____066
Fecha	07/01/2016
Hora	01:13
Protección o Alarma Operada	
Interruptor	52C2
Fecha Normaliza	07/01/2016
Hora Normaliza	01:24
Consumo (MW)	2.40
Comentario	Circuito Los Vidales
Subestación	RAUQUEN_____066
Fecha	07/01/2016
Hora	01:13
Protección o Alarma Operada	
Interruptor	52C4
Fecha Normaliza	07/01/2016
Hora Normaliza	01:30
Consumo (MW)	3.80
Comentario	Circuito Quilvo.
Subestación	RAUQUEN_____066
Fecha	07/01/2016
Hora	01:13
Protección o Alarma Operada	
Interruptor	52C5
Fecha Normaliza	07/01/2016
Hora Normaliza	02:00
Consumo (MW)	2.70
Comentario	Circuito Sarmiento.
Subestación	TENO_____066
Fecha	07/01/2016
Hora	01:13
Protección o Alarma Operada	
Interruptor	52C5
Fecha Normaliza	07/01/2016
Hora Normaliza	08:30
Consumo (MW)	.06

	Comentario	Circuito Cementos Bio-Bio.
Consumos Afectados		
	Subestación	CURICO_____066
	Fecha	07/01/2016
	Hora	01:13
	Protección o Alarma Operada	
	Interruptor	52C3
	Fecha Normaliza	07/01/2016
	Hora Normaliza	01:26
	Consumo (MW)	2.31
	Comentario	Circuito Rucatremo.
	Subestación	CURICO_____066
	Fecha	07/01/2016
	Hora	01:13
	Protección o Alarma Operada	
	Interruptor	52C5
	Fecha Normaliza	07/01/2016
	Hora Normaliza	01:27
	Consumo (MW)	1.83
	Comentario	Circuito Aguas Negras.
	Subestación	RAUQUEN_____066
	Fecha	07/01/2016
	Hora	01:13
	Protección o Alarma Operada	
	Interruptor	52C2
	Fecha Normaliza	07/01/2016
	Hora Normaliza	01:24
	Consumo (MW)	2.40
	Comentario	Circuito Los Vidales
	Subestación	RAUQUEN_____066
	Fecha	07/01/2016
	Hora	01:13
	Protección o Alarma Operada	
	Interruptor	52C4
	Fecha Normaliza	07/01/2016
	Hora Normaliza	01:30
	Consumo (MW)	3.80
	Comentario	Circuito Quilvo.
	Subestación	RAUQUEN_____066
	Fecha	07/01/2016
	Hora	01:13
	Protección o Alarma Operada	
	Interruptor	52C5
	Fecha Normaliza	07/01/2016
	Hora Normaliza	02:00
	Consumo (MW)	2.70
	Comentario	Circuito Sarmiento.
	Subestación	TENO_____066
	Fecha	07/01/2016
	Hora	01:13
	Protección o Alarma Operada	
	Interruptor	52C5
	Fecha Normaliza	07/01/2016
	Hora Normaliza	08:30
	Consumo (MW)	.06
	Comentario	Circuito Cementos Bio-Bio.

Hechos Sucedidos	

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INFORME DE FALLA - Nº IF00039/2016

Empresa : TRANSNET

Fecha : 07/01/2016

Hora : 09:45

Equipo Afectado :	**ESQUEMA EDAC** **Otro Elemento de Subestacion : SISTEMA EDAC** **EDAC Baja Frecuencia**
Perturbación :	**Fecha:** 07/01/2016 **Hora Inicio:** 01:13 Empresa instalación afectada:TRANSNET
Zona Afectada :	Sexta region /
Comuna Origen de Falla :	San Fernando
Informe con causa reiterada	NO
Causa Presunta:	Se investiga.
Causa Definitiva:	
Observaciones:	Operación por esquema EDAC, por falla externa a instalaciones de TRANSNET, afectando a la S/E Colchagua.
Acciones Inmediatas:	Coordinación con el CDC del CDEC-SIC para el cierre de los circuitos.
Acciones a Corto Plazo :	
Acciones a Largo Plazo :	
Consumo Afectado :	CGE Distribución / Perd. Estm. de Potencia: 10.01 MW / Region : SEXTA
Retorno :	**Estimado** **Fecha** 07/01/2016 **Hora** 01:38

Efectivo (a servicio o disponibilidad completa)

Equipo Afectado	Fecha	Hora
EDAC Baja Frecuencia	07/01/2016	01:38

Reporta Falla:	Roberto Reyes Ramírez

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INFORME DE FALLA - Nº IF00039/2016

Empresa : TRANSNET

Fecha : 07/01/2016

Hora : 09:45

Interruptores Operados, Actuación de Protecciones y Maniobras de Reposición:

Subestación	COLCHAGUA_____066
Fecha	07/01/2016
Hora	01:13
Protección o Alarma Operada	
Interruptor	52C1
Fecha Normaliza	07/01/2016
Hora Normaliza	01:38
Consumo (MW)	3.17
Comentario	Circuito Miraflores.
Subestación	COLCHAGUA_____066
Fecha	07/01/2016
Hora	01:13
Protección o Alarma Operada	
Interruptor	52C2
Fecha Normaliza	07/01/2016
Hora Normaliza	01:31
Consumo (MW)	1.92
Comentario	Circuito Tinguiririca.
Subestación	COLCHAGUA_____066
Fecha	07/01/2016
Hora	01:13
Protección o Alarma Operada	
Interruptor	52C3
Fecha Normaliza	07/01/2016
Hora Normaliza	01:22
Consumo (MW)	1.75
Comentario	Circuito Enap.
Subestación	COLCHAGUA_____066
Fecha	07/01/2016
Hora	01:13
Protección o Alarma Operada	
Interruptor	52C5
Fecha Normaliza	07/01/2016
Hora Normaliza	01:23
Consumo (MW)	3.17
Comentario	Circuito Maggi.

Consumos Afectados

Subestación	COLCHAGUA_____066
Fecha	07/01/2016
Hora	01:13
Protección o Alarma Operada	
Interruptor	52C1
Fecha Normaliza	07/01/2016
Hora Normaliza	01:38
Consumo (MW)	3.17
Comentario	Circuito Miraflores.
Subestación	COLCHAGUA_____066
Fecha	07/01/2016
Hora	01:13
Protección o Alarma Operada	
Interruptor	52C2

	Fecha Normaliza	07/01/2016
	Hora Normaliza	01:31
	Consumo (MW)	1.92
	Comentario	Circuito Tinguiririca.
	Subestación	COLCHAGUA_____066
	Fecha	07/01/2016
	Hora	01:13
	Protección o Alarma Operada	
	Interruptor	52C3
	Fecha Normaliza	07/01/2016
	Hora Normaliza	01:22
	Consumo (MW)	1.75
	Comentario	Circuito Enap.
	Subestación	COLCHAGUA_____066
	Fecha	07/01/2016
	Hora	01:13
	Protección o Alarma Operada	
	Interruptor	52C5
	Fecha Normaliza	07/01/2016
	Hora Normaliza	01:23
	Consumo (MW)	3.17
	Comentario	Circuito Maggi.
Hechos Sucedidos		

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INFORME DE FALLA - Nº IF00051/2016

Empresa : COOP. CURICO (CEC)

Fecha : 08/01/2016

Hora : 20:24

Equipo Afectado :	**CURICO_____066** **Otro Elemento de Subestacion : SISTEMA EDAC** **SISTEMA EDAC-BF**
Perturbación :	**Fecha:** 07/01/2016 **Hora Inicio:** 01:11 Empresa instalación afectada:Coop. Elect. Curicó
Zona Afectada :	Septima region /
Comuna Origen de Falla :	Curicó
Informe con causa reiterada	SI
Causa Presunta:	
Causa Definitiva:	**Código** **Descripción** 1010 Baja frecuencia **Detalle** OPERACIÓN EDAC
Observaciones:	NO HAY
Acciones Inmediatas:	SE COORDINA CON CENTRO DE CONTROL DE STS OSORNO QUIÉN MANEJA EL SCADA CEC
Acciones a Corto Plazo :	NO HAY
Acciones a Largo Plazo :	NO HAY
Consumo Afectado :	Coop. Eléct. Curicó CEC / Perd. Estm. de Potencia: 6.6 MW / Region : SEPTIMA
Retorno :	**Estimado** **Fecha** **Hora** 07/01/2016 02:18

Efectivo (a servicio o disponibilidad completa)

Equipo Afectado	Fecha	Hora
SISTEMA EDAC-BF	07/01/2016	02:18

Reporta Falla:	Osvaldo Marchant

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INFORME DE FALLA - Nº IF00051/2016

Empresa : COOP. CURICO (CEC)

Fecha : 08/01/2016

Hora : 20:24

Interruptores Operados, Actuación de Protecciones y Maniobras de Reposición:

Subestación	CURICO_____066
Fecha	07/01/2016
Hora	01:11
Protección o Alarma Operada	EDAC BAJA FRECUENCIA
Interruptor	52C6 Y 52C7
Fecha Normaliza	07/01/2016
Hora Normaliza	02:18
Consumo (MW)	6.6
Comentario	

Consumos Afectados

Subestación	CURICO_____066
Fecha	07/01/2016
Hora	01:11
Protección o Alarma Operada	EDAC BAJA FRECUENCIA
Interruptor	52C6 Y 52C7
Fecha Normaliza	07/01/2016
Hora Normaliza	02:18
Consumo (MW)	6.6
Comentario	

Hechos Sucedidos

Fecha y Hora	Hechos Sucedidos	Reporta
08/01/2016 20:15	A LA ESPERA DE AUTORIZACIÓN DEL CDEC-SIC PARA NORMALIZAR LOS CONSUMOS	Osvaldo Marchant

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INFORME DE FALLA - Nº IF00037/2016

Empresa : Arauco Generación S.A.

Fecha : 07/01/2016

Hora : 09:10

Equipo Afectado :	**MDP_TENO_ARAUCO____154** **Otro Elemento de Subestacion : SISTEMA EDAC** **ESQUEMA EDAC - BF**
Perturbación :	**Fecha:** 07/01/2016 **Hora Inicio:** 01:13 Empresa instalación afectada:Arauco Bioenergía
Zona Afectada :	Sexta region /
Comuna Origen de Falla :	Buin
Informe con causa reiterada	NO
Causa Presunta:	
Causa Definitiva:	**Código** **Descripción** 1010 Baja frecuencia **Detalle** Interrupción de las líneas de 154 kV Tiguiririca-Rancagua-A.Jahuel.
Observaciones:	Planta MDP Teno pierde 1,3 MW de consumo debido a baja frecuencia (48,53 Hz). Operó escalón 4.
Acciones Inmediatas:	
Acciones a Corto Plazo :	No aplica.
Acciones a Largo Plazo :	No aplica.
Consumo Afectado :	Planta MDP Teno 154 kV / Perd. Estm. de Potencia: 1.3 MW / Region : SEPTIMA
Retorno :	**Estimado** **Fecha** **Hora** 07/01/2016 01:21

Efectivo (a servicio o disponibilidad completa)

Equipo Afectado	Fecha	Hora
ESQUEMA EDAC - BF	07/01/2015	01:21

Reporta Falla:	Erick Iturra H.

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INFORME DE FALLA - Nº IF00037/2016

Empresa : Arauco Generación S.A.

Fecha : 07/01/2016

Hora : 09:10

Interruptores Operados, Actuación de Protecciones y Maniobras de Reposición:

Subestación	MDP_TENO_ARAUCO____154
Fecha	07/01/2016
Hora	01:13
Protección o Alarma Operada	Baja Frecuencia
Interruptor	Escalón 4
Fecha Normaliza	07/01/2016
Hora Normaliza	01:21
Consumo (MW)	1.30
Comentario	Baja Frecuencia (48,53 Hz)

Consumos Afectados

Subestación	MDP_TENO_ARAUCO____154
Fecha	07/01/2016
Hora	01:13
Protección o Alarma Operada	Baja Frecuencia
Interruptor	Escalón 4
Fecha Normaliza	07/01/2016
Hora Normaliza	01:21
Consumo (MW)	1.30
Comentario	Baja Frecuencia (48,53 Hz)

Hechos Sucedidos

Fecha y Hora	Hechos Sucedidos	Reporta
07/01/2016 09:03	Planta MDP Teno pierde 1,3 MW de consumo debido a baja frecuencia (48,53 Hz). Se encontraba con 5,3 MW de consumo.	Erick Iturra H.

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INFORME DE FALLA - Nº IF00047/2016

Empresa : Hidroeléctrica La Higuera

Fecha : 07/01/2016

Hora : 23:43

Equipo Afectado :	**Central : LA CONFLUENCIA** Unidad : U1 Desconexión Unidad(es) Unidad U1 Pérdida Generación : 30 MW
Perturbación :	**Fecha:** 07/01/2016 **Hora Inicio:** 01:13 Empresa instalación afectada:Hidroeléctrica La Higuera
Zona Afectada :	Sexta region /
Comuna Origen de Falla :	San Fernando
Informe con causa reiterada	NO
Causa Presunta:	
Causa Definitiva:	**Código** **Descripción** 2030 Robo de Conductor **Detalle** Robo de Conductores, en línea alta tensión 154kV
Observaciones:	A las 01:07, comienza a producirse un fuerte desequilibrio de cargas, y oscilación en la frecuencia.
Acciones Inmediatas:	Se intentó bajar carga de las unidades generadoras, en virtud de la frecuencia, sin embargo tomo el control de las unidades el sistema EDAG.
Acciones a Corto Plazo :	N/A
Acciones a Largo Plazo :	N/A
Consumo Afectado :	CGE Distribución / Perd. Estm. de Potencia: 30 MW / Region :
Origen de la Falla :	Externa
Retorno :	**Estimado** **Fecha** **Hora** 07/01/2016 01:22 **Efectivo (a servicio o disponibilidad completa)** Unidad Afectada **Fecha** **Hora** Unidad : U1 08/01/2016 01:22
Reporta Falla:	RAFAEL SAEZ

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INFORME DE FALLA - Nº IF00047/2016

Empresa : Hidroeléctrica La Higuera

Fecha : 07/01/2016

Hora : 23:43

Interruptores Operados, Actuación de Protecciones y Maniobras de Reposición:

Central	LA CONFLUENCIA
Fecha	07/01/2016
Hora	01:13
Protección o Alarma Operada	86 PR
Interruptor	52G
Fecha Normaliza	07/01/2016
Hora Normaliza	01:22
Consumo (MW)	30.00
Comentario	Falla SIC

Consumos Afectados

Central	LA CONFLUENCIA
Fecha	07/01/2016
Hora	01:13
Protección o Alarma Operada	86 PR
Interruptor	52G
Fecha Normaliza	07/01/2016
Hora Normaliza	01:22
Consumo (MW)	30.00
Comentario	Falla SIC

Hechos Sucedidos

Fecha y Hora	Hechos Sucedidos	Reporta
07/01/2016 23:19	01:07, fuertes variaciones de cargas y frecuencia. 01:08 tomo control de las unidades el EDAG cual mando a bajar las cargas de las unidades,sin embargo no fue suficiente. 01:13, EDAG provoca la apertura del interruptor, quedando la unidad en vacio, pero a velocidad nominal y lista para conectar. Se esperó a que el fenomeno de oscilación de frecuencia y el desequilibrio de cargas se controlará. 01:22 se vuelve a sincronizar unidad, subiendo carga en forma lenta, en observancia del comportamiento de la frecuencia.	RAFAEL SAEZ

Imprimir Cerrar

ANEXO Nº 6
Otros antecedentes aportados por Transelec S.A., Transnet S.A., Arauco Bioenergía S.A. y Cooperativa de Abastecimiento de Energía Eléctrica Curicó Ltda.

Informe de Desconexión Forzada IF00029 – 00030 – 00031 – 00045 – 00046 / 2016 del día 07 de enero de 2016. Código 2030.

1. Características de la desconexión forzada

A las 01:07 horas del día 07 de enero de 2016, se produjo la desconexión del circuito 2 de la línea 154 kV Tinguiririca – Rancagua – Alto Jahuel, producto de un cortocircuito monofásico entre la fase A y tierra, causado para robar conductor de la línea, entre las estructuras N° 354 y 355, a aproximadamente 53 km de la S/E Alto Jahuel (sector Tap Punta Cortés – Tap Tuniche). Transcurridos 14 s se produjo la apertura del interruptor 52A3 de la S/E Tinguiririca, desconectando el circuito 2 de la línea 154 kV Tinguiririca - Itahue.

A las 01:18 horas del día 07 de enero de 2016, se produjo la desconexión del circuito 1 de la línea 154 kV Tinguiririca – Rancagua – Alto Jahuel, producto de un cortocircuito monofásico entre la fase B y tierra, causado para robar conductor de la línea entre las estructuras N° 354 y 355, a aproximadamente 53 km de la S/E Alto Jahuel.

2. Instalaciones afectadas directa o indirectamente por la falla indicando horas de desconexión y reposición.

a. Las siguientes instalaciones de TRANSELEC fueron afectadas por la desconexión:
- **i.** Circuitos 1 y 2 de la línea 154 kV Tinguiririca – Rancagua – Alto Jahuel.
- **ii.** Circuito 2 de la línea 154 kV Tinguiririca - Itahue.

b. Otras instalaciones afectadas por la desconexión (de acuerdo al informe de novedades del CDC):
- **i.** SS/EE Cachapoal, Machalí, Loreto, Lo Miranda, Tuniche y Quinta de Tilcoco, Las Cabras, San Fernando, Teno, Buin, Fátima, Hospital, Isla de Maipo, Graneros, San Francisco de Mostazal, Papelera Talagante y el Manzano. (propiedad de Transnet).

c. El origen de la falla se ubica en la Sexta Región, provincia del Cachapoal, comuna de Rancagua, código de comuna 6101.

3. Pérdidas de Generación, indicando monto y horas de desconexión y reposición.

TRANSELEC no tiene equipos de generación entre sus instalaciones.

4. Pérdidas de Consumos, indicando el detalle por subestación de los montos, horas de desconexión y reposición.

Previo a la desconexión y de acuerdo al registro de nuestro sistema SCADA, se transmitían por la línea 2 x 154 kV Tinguiririca – Rancagua – Alto Jahuel, circuito N° 1:

- Desde S/E Alto Jahuel (hacía SS/EE Rancagua y Tinguiririca), alrededor de 31,3 MW.
- Desde el Tap Tuniche hacia S/E Rancagua, alrededor de 16,3 MW.
- Desde S/E Tinguiririca (hacía SS/EE Rancagua y Alto Jahuel), alrededor de 90,01 MW.

Previo a la desconexión y de acuerdo al registro de nuestro sistema SCADA, se transmitían por la línea 2 x 154 kV Tinguiririca – Rancagua – Alto Jahuel, circuito N° 2:

- Desde SS/EE Rancagua y Tinguiririca hacia S/E Alto Jahuel, alrededor de 23,62 MW.
- Desde S/E Tinguiririca (hacía SS/EE Rancagua y Alto Jahuel), alrededor de 102 MW.

5. Cronología de eventos, y descripción de las causas directa de cada evento.

A las 01:07 horas del día 07 de enero de 2016, se produjo la desconexión del circuito 2 de la línea 154 kV Tinguiririca – Rancagua – Alto Jahuel, producto de un cortocircuito monofásico entre la fase A y tierra, causado para robar conductor de la línea, entre las estructuras N° 354 y 355, a aproximadamente 53 km de la S/E Alto Jahuel (sector Tap Punta Cortés – Tap Tuniche). Transcurridos 14 s se produjo la apertura del interruptor 52A3 de la S/E Tinguiririca, desconectando el circuito 2 de la línea 154 kV Tinguiririca - Itahue.

A las 01:18 horas del día 07 de enero de 2016, se produjo la desconexión del circuito 1 de la línea 154 kV Tinguiririca – Rancagua – Alto Jahuel, producto de un cortocircuito monofásico entre la fase B y tierra, causado para robar conductor de la línea entre las estructuras N° 354 y 355, a aproximadamente 53 km de la S/E Alto Jahuel.

a. Acciones orientadas a la reposición del servicio y normalización de las instalaciones.

- **i.** Inmediatamente ocurrida la desconexión, se recopilaron las alarmas operadas.
- **ii.** A las 01:13 horas, se abrieron los interruptores 52A2 y 52A3 en S/E Tap Punta de Cortés, seccionando la línea 154 kV Alto Jahuel – Rancagua - Tinguiririca.
- **iii.** A las 01:17 horas, en coordinación con el CDC, se sincronizó el circuito N° 1 de la línea 154 kV Itahue – Tinguiririca, desde la S/E Itahue (los interruptores 52A3 y 52A4 de S/E Itahue se encontraban abierto a solicitud del CDC).
- **iv.** A las 01:27 horas, en coordinación con el CDC, se realizaron dos intentos consecutivos de cierre de la línea 154 kV Tinguiririca – Rancagua – Alto Jahuel, circuito N° 1, desde el extremo de S/E Alto Jahuel, interruptor 52A1, los cuales no resultaron exitosos.
- **v.** A las 01:28 horas, en coordinación con el CDC, se realizó un intento de cierre de la línea 154 kV Tinguiririca – Rancagua – Alto Jahuel, circuito N° 2, desde el extremo de S/E Alto Jahuel, interruptor 52A2, el cual no resultó sin exito.
- **vi.** A las 01:32 horas se cerraron los interruptores 52A3 de S/E Tinguiririca y 52A4 de S/E Itahue, con lo cual se energizó la línea 154 Itahue – Tinguiririca, circuito N° 2.
- **vii.** A las 02:59 horas, se cerró el interruptor 52A10 de S/E Tinguiririca, energizando el sector desde S/E Malloa a S/E Tinguiririca.
- **viii.** A las 04:19 horas, en coordinación con el CDC, se iniciaron los trabajos de reparación del conductor de los circuitos 1 y 2 de la línea 154 kV Tinguiririca – Rancagua – Alto Jahuel, sector Tap Punta de Cortés – Tap Tuniche, asociados a las solicitudes de desconexión de curso forzoso SD00614/2016 y SD00689/2016.
- **ix.** A las 08:47 horas, en coordinación con el CDC, se energizó la línea 154 kV Tinguiririca – Rancagua – Alto Jahuel, circuito N° 1, con puentes abiertos en la estructura N° 359. Se normalizan los consumos de S/E Rancagua.
- **x.** A las 10:39 horas, en coordinación con el CDC se cerró el interruptor 52A2 en S/E Tap Punta de Cortés.
- **xi.** A las 21:05 horas, en coordinación con el CDC, se energizó la línea Tinguiririca – Rancagua – Alto Jahuel, circuito N° 2, sector Alto Jahuel – Tap Punta de Cortés – Rancagua.
- **xii.** A las 21:05 horas finalizan los trabajos de reparación de la línea 154 kV Tinguiririca – Rancagua – Alto Jahuel circuitos 1 y 2, y se cierran los puentes de la estructura N° 359.

6. Esquemas de protección y control involucrados en la falla.

a. Detalle de las protecciones operadas
<u>Circuito 2 línea 2x154 kV Tinguiririca – Rancagua – Alto Jahuel (01:07:26 horas)</u>
Paño A2, 154 kV, S/E Alto Jahuel:

Sistema 1: Protección GE D60, función 21N, Zona 1, fase A y tierra.
Sistema 2: Protección Siemens 7SA612, función 21N, Zona 1, fase A y tierra.

Paño A1, 154 kV, S/E Rancagua:
Sistema 1: Protección Siemens 7SA612, función 21N, Zona 1, fase A y tierra.
Sistema 2: Protección GE D60. No alcanza a operar antes que el sistema 1.

Paño A10, 154 kV, S/E Tinguiririca:
Sistema 1: Protección Siemens 7SA612, función 21N, Zona 1, fase A y tierra.
Sistema 2: Protección GE D60, función 21N, Zona 1, fase A y tierra.

Circuito 2 línea 2x154 kV Tinguiririca – Rancagua – Alto Jahuel (01:27:15 horas, reconexión manual sin éxito)
Paño A2, 154 kV, S/E Alto Jahuel:
Sistema 1: Protección GE D60, función 21N, Zona 2 acelerada, fase A y tierra.
Sistema 2: Protección Siemens 7SA612, función 21N, Zona 1, fase A y tierra.

Circuito 2 línea 2x154 kV Tinguiririca – Rancagua – Alto Jahuel (01:27:53 horas, reconexión manual sin éxito)
P*año A2, 154 kV, S/E Alto Jahuel:*
Sistema 1: Protección GE D60, función 21N, Zona 2 acelerada, fase A y tierra.
Sistema 2: Protección Siemens 7SA612, función 50HS (cierre contra falla), fase A.

Circuito 1 línea 2x154 kV Tinguiririca – Rancagua – Alto Jahuel (01:18 horas)
Paño A1, 154 kV, S/E Alto Jahuel:
Sistema 1: Protección GE D60, función 21N, Zona 2 acelerada, fase B a tierra.
Sistema 2: Protección Siemens 7SA612, función 21N, Zona 1, fase B a tierra.

Paño A2, 154 kV, S/E Rancagua:
Sistema 1: Protección Siemens 7SA612, función 21N, Zona 1, fase B a tierra.
Sistema 2: Protección GE D60. No alcanza a operar antes que el sistema 1.

Circuito 1 línea 2x154 kV Tinguiririca – Rancagua – Alto Jahuel (01:26 horas, reconexión manual)
Paño A1, 154 kV, S/E Alto Jahuel:
Sistema 1: Protección GE D60, función 21N, Zona 2 acelerada, fase B a tierra.
Sistema 2: Protección Siemens 7SA612, función 50HS (cierre contra falla), fase B.

Circuito 2 línea 154 kV Itahue – Tinguiririca (01:07:38 horas)
Paño A3, 154 kV, de la S/E Tinguiririca:
No se registra operación de protecciones en este paño.

b. Ajustes y características de las protecciones operadas.
(En archivos adjuntos).

c. Registros de la falla.
(En archivos adjuntos).

d. Análisis del comportamiento de los dispositivos de protección y control.

Operación a las 01:07 horas:

Paño A2, 154 kV, S/E Alto Jahuel, sistemas 1 y 2:

- Protección GE D60, sistema 1: De las oscilografías, señales digitales y del registro de eventos generados por este sistema se observa un cortocircuito monofásico entre la fase A y tierra, en dirección adelante, el cual fue detectado por la función 21N en Zona 1, enviando señal de aceleración a los otros extremos de la línea y dando orden de apertura instantánea al interruptor 52A2, operando de acuerdo a sus ajustes.
- Protección Siemens 7SA612, sistema 2: De las oscilografías, señales digitales y del registro de eventos generados por este sistema se observa un cortocircuito monofásico entre la fase A y tierra, en dirección adelante, el cual fue detectado por la función 21N en Zona 1, enviando señal de aceleración a los otros extremos de la línea y dando orden de apertura instantánea al interruptor 52A2, operando de acuerdo a sus ajustes.

Paño A1, 154 kV, S/E Rancagua, sistemas 1 y 2:

- Protección Siemens 7SA612, sistema 1: De las oscilografías, señales digitales y del registro de eventos generados por este sistema se observa un cortocircuito monofásico entre la fase A y tierra, en dirección adelante, el cual fue detectado por la función 21N en Zona 1, enviando señal de aceleración a los otros extremos de la línea y dando orden de apertura instantánea al interruptor 52A1, operando de acuerdo a sus ajustes.
- Protección GE D60, sistema 2: Este sistema detecta la falla, sin embargo no alcanza a operar antes que el sistema 1, por lo cual no generó registros oscilográficos y de eventos.

Paño A10, 154 kV, S/E Tinguiririca, sistemas 1 y 2:

- Protección Siemens 7SA612, sistema 1: De las oscilografías, señales digitales y del registro de eventos generados por este sistema se observa un cortocircuito monofásico entre la fase A y tierra, en dirección adelante, el cual fue detectado por la función 21N en Zona 1, enviando señal de aceleración a los otros extremos de la línea y dando orden de apertura instantánea al interruptor 52A10, operando de acuerdo a sus ajustes.
- Protección GE D60, sistema 2: De las oscilografías, señales digitales y del registro de eventos generados por este sistema se observa un cortocircuito monofásico entre la fase A y tierra, en dirección adelante, el cual fue detectado por la función 21N en Zona 1, enviando señal de aceleración a los otros extremos de la línea y dando orden de apertura instantánea al interruptor 52A10, operando de acuerdo a sus ajustes.

Operación a las 01:18 horas:

Paño A1, 154 kV, S/E Alto Jahuel, sistemas 1 y 2:

- Protección GE D60, sistema 1: De las oscilografías, señales digitales y del registro de eventos generados por este sistema se observa un cortocircuito monofásico entre la fase B y tierra, en dirección adelante, el cual fue detectado por la función 21N en Zona 2 acelerada, además recibió señal de aceleración desde el extremo de S/E Rancagua, por lo cual dio orden de apertura instantánea al interruptor 52A1. Adicionalmente envió señal de aceleración hacia el extremo de S/E Rancagua, operando de acuerdo a sus ajustes.
- Protección Siemens 7SA612, sistema 2: De las oscilografías, señales digitales y del registro de eventos generados por este sistema se observa un cortocircuito monofásico entre la fase B y tierra, en dirección adelante, el cual fue detectado por la función 21N en Zona 1, además recibió señal de aceleración desde al extremo de S/E Rancagua y dio orden de apertura

instantánea al interruptor 52A1. Adicionalmente envío señal de aceleración hacia el extremo de S/E Rancagua, operando de acuerdo a sus ajustes.

Paño A2, 154 kV, S/E Rancagua, sistemas 1 y 2:

- Protección Siemens 7SA612, sistema 1: De las oscilografías, señales digitales y del registro de eventos generados por este sistema se observa un cortocircuito monofásico entre la fase B y tierra, en dirección adelante, el cual fue detectado por la función 21N en Zona 1, enviando señal de aceleración a los otros extremos de la línea y dando orden de apertura instantánea al interruptor 52A2, operando de acuerdo a sus ajustes.
- Protección GE D60, sistema 2: De las oscilografías, señales digitales y del registro de eventos generados por este sistema se observa un cortocircuito monofásico entre la fase B y tierra, en dirección adelante, el cual fue detectado por la función 21N en Zona 1, por lo cual dio orden de apertura instantánea al interruptor 52A2, operando de acuerdo a sus ajustes.

Paño A9, 154 kV, S/E Tinguiririca, sistemas 1 y 2:

- No se registra operación de las protecciones debido a que se encontraban abiertos los interruptores en 52A2 y 52A3 en S/E Tap Punta de Cortés.

Operación a las 01:26 horas:

A las 01:26 horas se realiza un intento de cierre de la línea 154 kV Tinguiririca – Rancagua – Alto Jahuel, circuito N° 1, sin éxito, desde el extremo en S/E Alto Jahuel interruptor 52A1, a continuación se indica la actuación de los sistemas de protección:

Paño A1, 154 kV, S/E Alto Jahuel, sistemas 1 y 2:

- Protección GE D60, sistema 1: De las oscilografías, señales digitales y del registro de eventos generados por este sistema se observa un cortocircuito monofásico entre la fase B y tierra, en dirección adelante, el cual fue detectado por la función 21N en Zona 2 acelerada, adicionalmente recibió señal de aceleración desde el extremo de S/E Rancagua, por lo cual dio orden de apertura instantánea al interruptor 52A1. Adicionalmente envió señal de aceleración hacia el extremo de S/E Rancagua, operando de acuerdo a sus ajustes.
- Protección Siemens 7SA612, sistema 2: De las oscilografías, señales digitales y del registro de eventos generados por este sistema se observa un cortocircuito monofásico entre la fase B y tierra, en dirección adelante, el cual fue detectado por la función 50HS (cierre contra falla), por lo cual dio orden de apertura instantánea al interruptor.

Operación a las 01:27:15 horas:

A las 01:27:15 horas se realiza un intento de cierre de la línea 154 kV Tinguiririca – Rancagua – Alto Jahuel, circuito N° 2, sin éxito, desde el extremo en S/E Alto Jahuel interruptor 52A2, a continuación se indica la actuación de los sistemas de protección:

Paño A2, 154 kV, S/E Alto Jahuel, sistemas 1 y 2:

- Protección GE D60, sistema 1: De las oscilografías, señales digitales y del registro de eventos generados por este sistema se observa un cortocircuito monofásico entre la fase A y tierra, en dirección adelante, el cual fue detectado por la función 21N en Zona 2 acelerada, además recibió señal de aceleración desde el extremo de S/E Rancagua, por lo cual dio orden de apertura instantánea al interruptor 52A1. Adicionalmente envió señal de aceleración hacia el extremo de S/E Rancagua, operando de acuerdo a sus ajustes.

- Protección Siemens 7SA612, sistema 2: De las oscilografías, señales digitales y del registro de eventos generados por este sistema se observa un cortocircuito monofásico entre la fase A y tierra, en dirección adelante, el cual fue detectado por la función 21N en Zona 1, enviando señal de aceleración a los otros extremos de la línea y dando orden de apertura instantánea al interruptor 52A2, operando de acuerdo a sus ajustes.

Operación a las 01:27:53 horas:

A las 01:27:53 horas se realiza un cierre de la línea 154 kV Tinguiririca – Rancagua – Alto Jahuel, circuito N° 2, el cual resulta sin éxito, desde el extremo en S/E Alto Jahuel, a continuación se indica la actuación de los sistemas de protección:

Paño A2, 154 kV, S/E Alto Jahuel, sistemas 1 y 2:

- Protección GE D60, sistema 1: De las oscilografías, señales digitales y del registro de eventos generados por este sistema se observa un cortocircuito monofásico entre la fase A y tierra, en dirección adelante, el cual fue detectado por la función 21N en Zona 2 acelerada, además recibió señal de aceleración desde el extremo de S/E Rancagua, por lo cual dio orden de apertura instantánea al interruptor 52A2. Adicionalmente envió señal de aceleración hacia el extremo de S/E Rancagua, operando de acuerdo a sus ajustes.
- Protección Siemens 7SA612, sistema 2: De las oscilografías, señales digitales y del registro de eventos generados por este sistema se observa un cortocircuito monofásico entre la fase A y tierra, en dirección adelante, el cual fue detectado por la función 50HS (cierre contra falla), por lo cual dio orden de apertura instantánea al interruptor.

Operación a las 01:07:38 horas:

Paño A3, 154 kV, de la S/E Tinguiririca:

- De acuerdo a los registros del sistema SCADA de Transelec a las 01:07:38 s se produjo la apertura del interruptor 52A3 en S/E Tinguiririca, asociado a la línea 154 kV Itahue – Tinguiririca circuito N° 2, sin embargo los sistemas de protección asociados a este interruptor no registran eventos de operación. Se presume que su apertura se debió a la operación EDAG asociado a Hidroeléctrica La Higuera, sin embargo Transelec no tiene registros de su operación.

7. Análisis conjunto de:

a. Causas y consecuencias de la falla

A las 01:07 horas del día 07 de enero de 2016, se produjo la desconexión del circuito 2 de la línea 154 kV Tinguiririca – Rancagua – Alto Jahuel, producto de un cortocircuito monofásico entre la fase A y tierra, causado para robar conductor de la línea, entre las estructuras N° 354 y 355, a aproximadamente 53 km de la S/E Alto Jahuel (sector Tap Punta Cortés – Tap Tuniche). Transcurridos 14 s se produjo la apertura del interruptor 52A3 de la S/E Tinguiririca, desconectando el circuito 2 de la línea 154 kV Tinguiririca - Itahue.

A las 01:18 horas del día 07 de enero de 2016, se produjo la desconexión del circuito 1 de la línea 154 kV Tinguiririca – Rancagua – Alto Jahuel, producto de un cortocircuito monofásico entre la fase B y tierra, causado para robar conductor de la línea entre las estructuras N° 354 y 355, a aproximadamente a 53 km de la S/E Alto Jahuel.

La transferencia de potencia activa por el circuito, previa a su desconexión, se detalla en el punto 4.

b. Actuación de los dispositivos de protección y control,
De acuerdo a los antecedentes disponibles, las protecciones operaron de acuerdo a sus ajustes.

c. Medidas o acciones adoptadas para mitigar los efectos de la falla y para normalización del suministro.

i. Ver punto 5.

8. Reiteración de la falla según código de descripción en los últimos doce meses

Se registran las siguientes desconexiones de la línea 2 x 154 kV Tinguiririca – Rancagua – Alto Jahuel circuito N° 1 y 2 con la misma descripción de causa:

- IF00627/2015, 13-03-2015, código de causa N° 2030, Robo de Conductor.
- IF00679/2015, 20-03-2015, código de causa N° 2030, Robo de Conductor.
- IF01069/2015, 03-04-2015, código de causa N° 2030, Robo de Conductor.
- IF01245/2015, 23-04-2015, código de causa N° 2030, Robo de Conductor.
- IF02946/2015, 20-11-2015, código de causa N° 2030, Robo de Conductor.

9. Acciones correctivas de corto y largo plazo en caso de comportamiento erróneo de instalaciones.
No hay.

10. Códigos según DO N° 0815/2014.

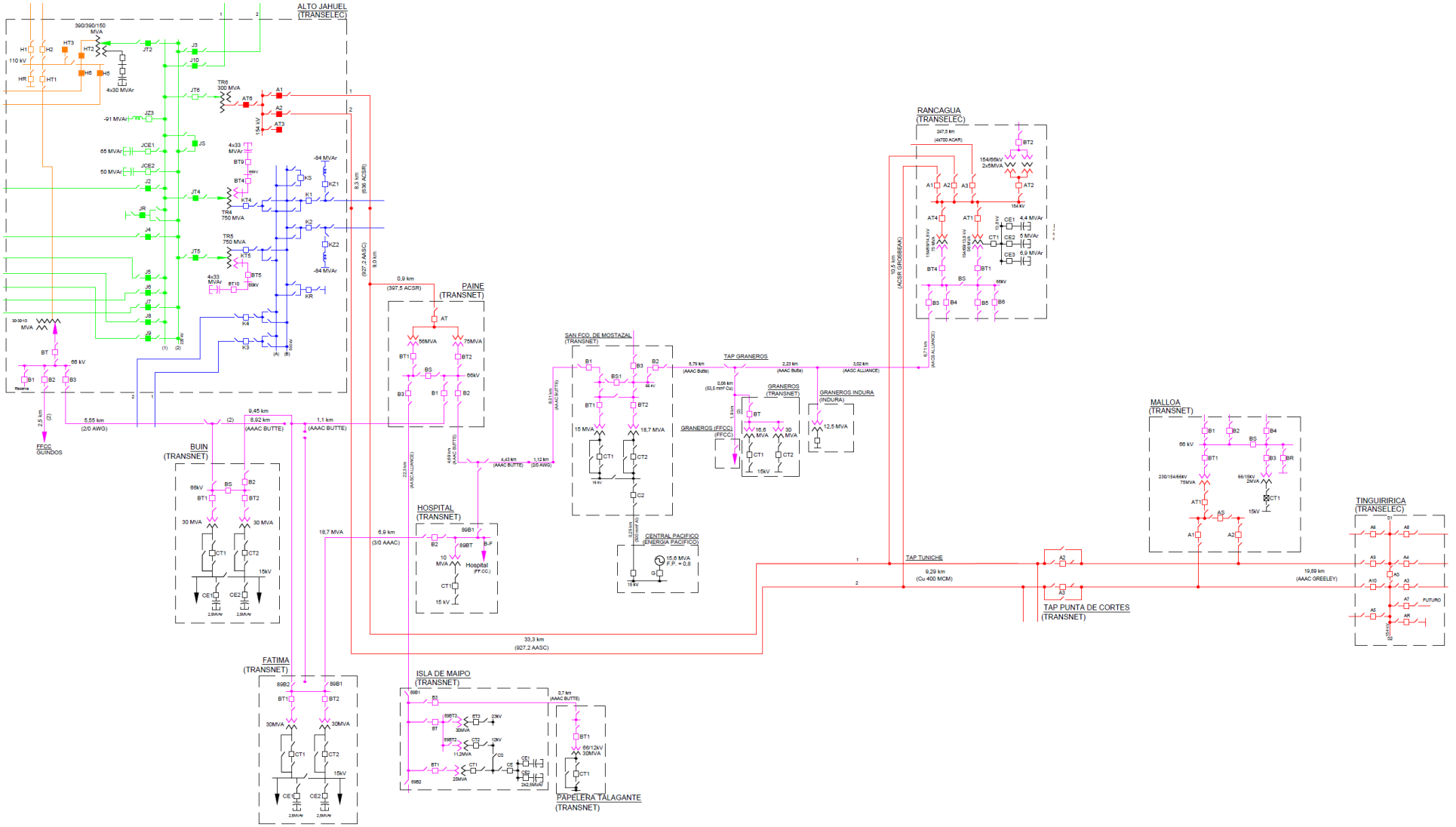
	Código	Descripción
FENOMENO_FISICO_ID	VAN3	Robo conductor o equipo
ELEMENTO_ID	TX2	Conductores.
FENOMENO_ELECTRICO_ID	DI21N	Distancia residual
MODO_ID	13	Opera según lo esperado.

11. Otros antecedentes que la empresa considere relevantes para el análisis y respaldo de las conclusiones.

- En el Anexo 1, se adjunta el diagrama unilineal de las instalaciones involucradas en la falla.
- En el Anexo 2, se adjuntan los registros oscilográficos y señales digitales generadas por las protecciones operadas.
- En el Anexo 3, se adjunta el registro de eventos generado por las protecciones operadas.

Anexo 1: Diagrama unilineal

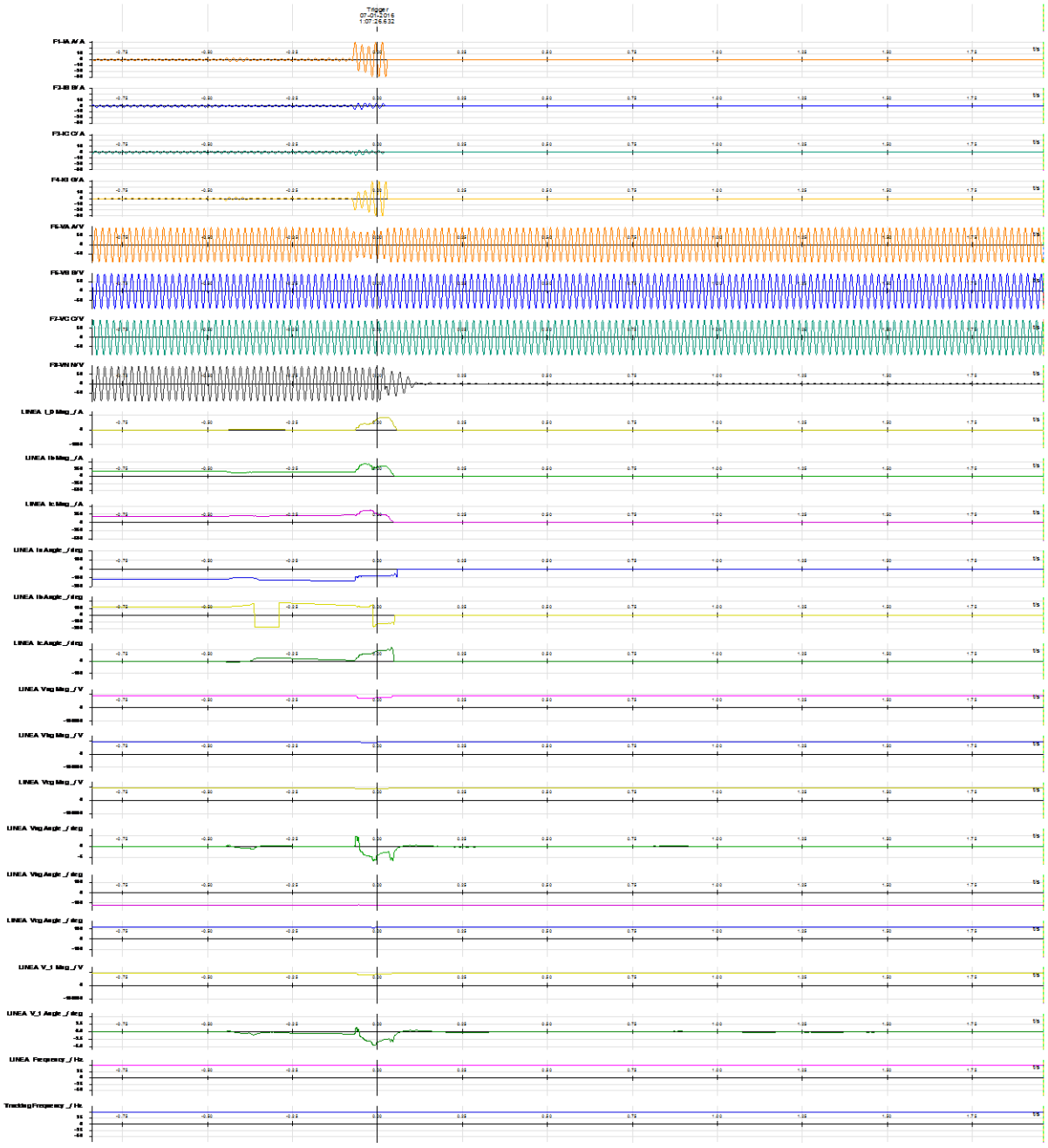
Figura 1: Diagrama unilineal de las instalaciones involucradas en la falla.

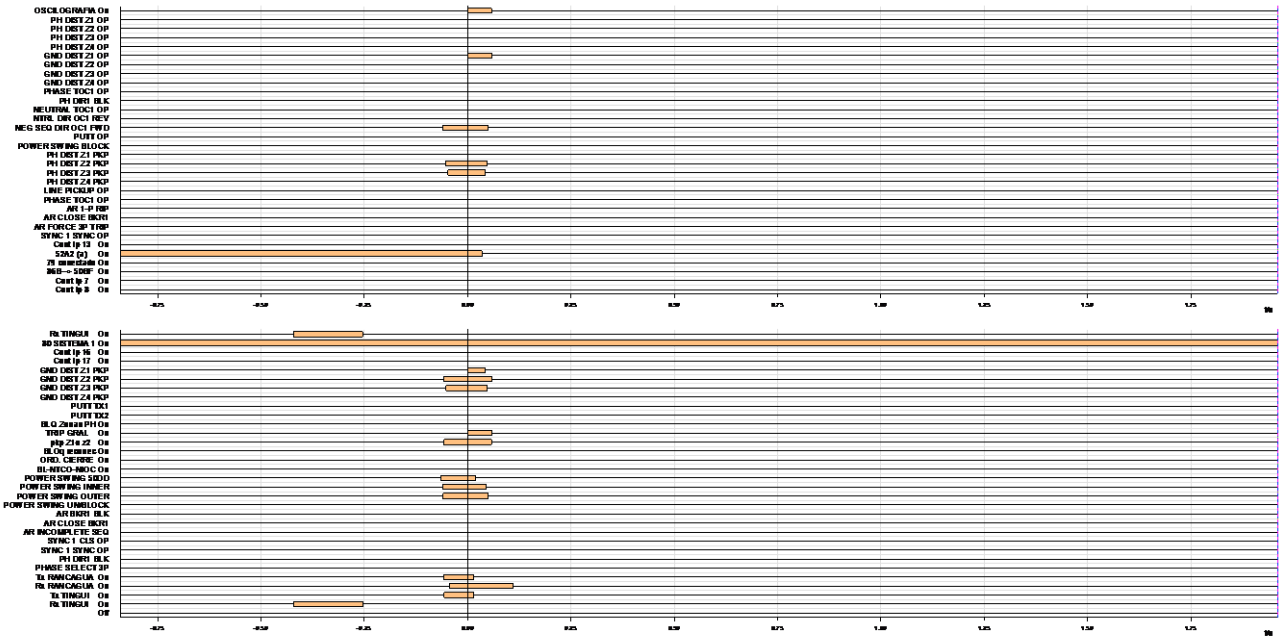


Anexo 2: Oscilografías y señales digitales

Figura 2: Registro de oscilografías y señales digitales

GE D60, paño A2, S/E Alto Jahuel – Sistema 1 (01:07:26 horas).




OSCILOGRAFIA Os
PH DIST Z1 OP
PH DIST Z2 OP
PH DIST Z3 OP
PH DIST Z4 OP
GND DIST Z1 OP
GND DIST Z2 OP
GND DIST Z3 OP
GND DIST Z4 OP
PHASE TOC1 OP
PH DIR1 BLK
NEUTRAL TOC1 OP
NTRL DIR OC1 REV
NEG SEQ DIR OC1 FWD
PUTT OP
POWER SWING BLOCK
PH DIST Z1 PKP
PH DIST Z2 PKP
PH DIST Z3 PKP
PH DIST Z4 PKP
LINE PICKUP OP
PHASE TOC1 OP
AR 1-P TRP
AR CLOSE BKR1
AR FORCE 3P TRIP
SYNC 1 SYNC OP
Cont Ip 13 Os
52A2 (a) Os
25 sincrocom Os
86B--> 50BF Os
Cont Ip 7 Os
Cont Ip 8 Os

Rx TINGUI Os
86 SISTEMA 1 Os
Cont Ip 16 Os
Cont Ip 17 Os
GND DIST Z1 PKP
GND DIST Z2 PKP
GND DIST Z3 PKP
GND DIST Z4 PKP
PUTT TX1
PUTT TX2
BLQ 2anas PH Os
TRIP GRAL Os
pkp Z1 o Z2 Os
BLOq remotos Os
ORD. CIERRE Os
BL-NEGO-NIOC Os
POWER SWING 50DD
POWER SWING INNER
POWER SWING OUTER
POWER SWING UNBLOCK
AR BKR1 BLK
AR CLOSE BKR1
AR INCOMPLETE SEQ
SYNC 1 CLS OP
SYNC 1 SYNC OP
PH DIR1 BLK
PHASE SELECT 3P
Tx RANCAGUA Os
Rx RANCAGUA Os
Tx TINGUI Os
Rx TINGUI Os
Of

Figura 3: Registro de oscilografías y señales digitales

Siemens 7SA612, paño A2, S/E Alto Jahuel – Sistema 2 (01:07:26 horas).

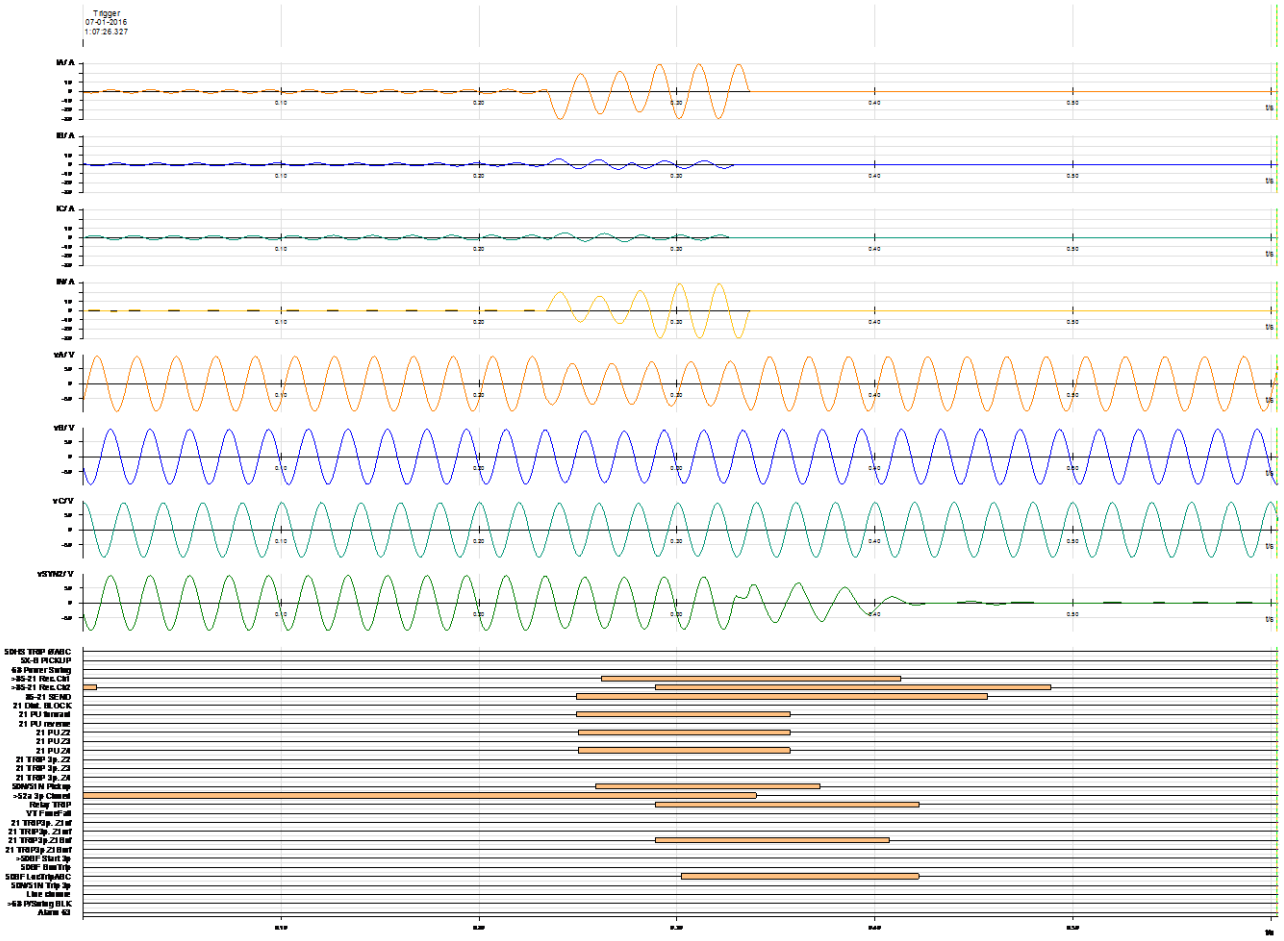


Figura 4: Registro de oscilografías y señales digitales

Siemens 7SA612, paño A1, S/E Rancagua – Sistema 1 (01:07:26 horas).

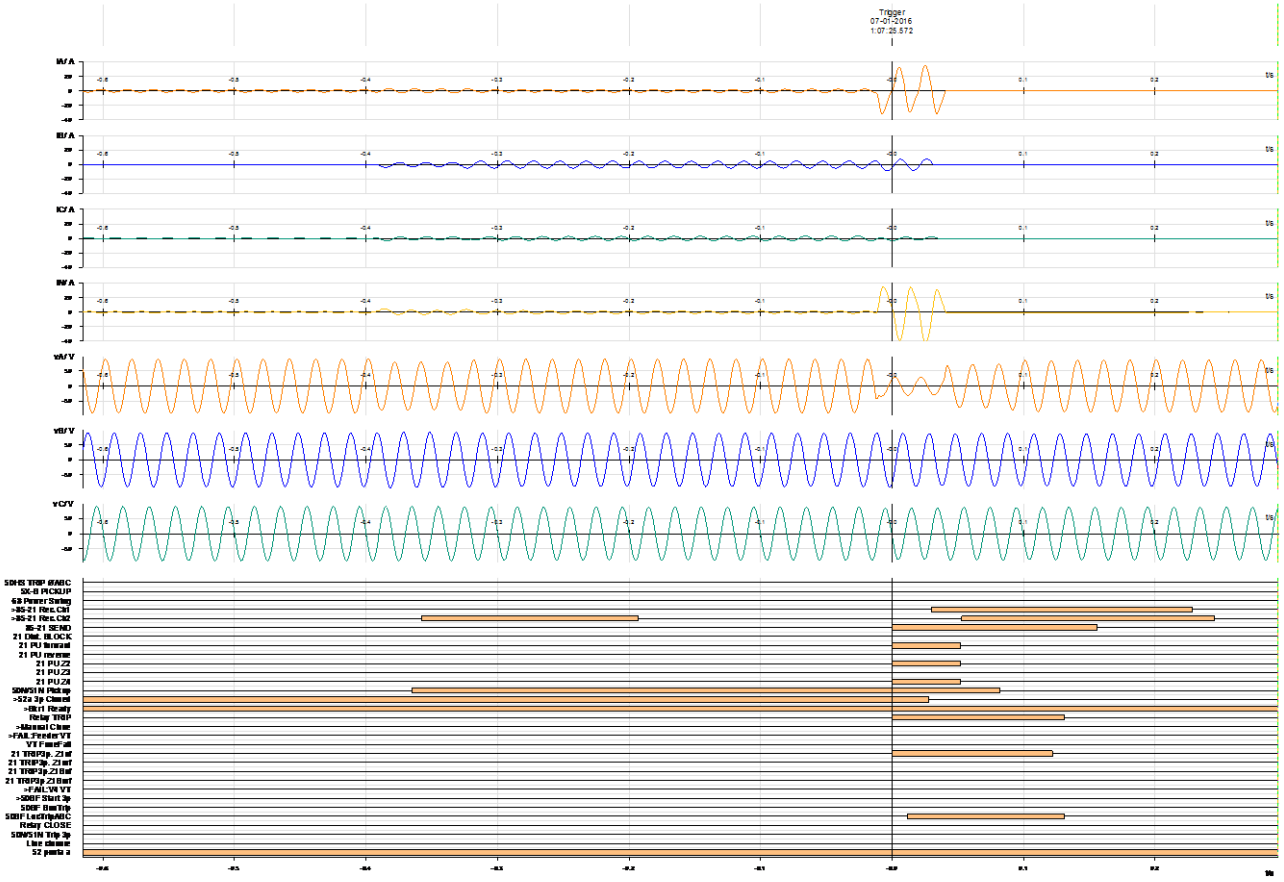


Figura 5: Registro de oscilografías y señales digitales

Siemens 7SA612, paño A10 S/E Tinguiririca – Sistema 1 (01:07:26 horas).

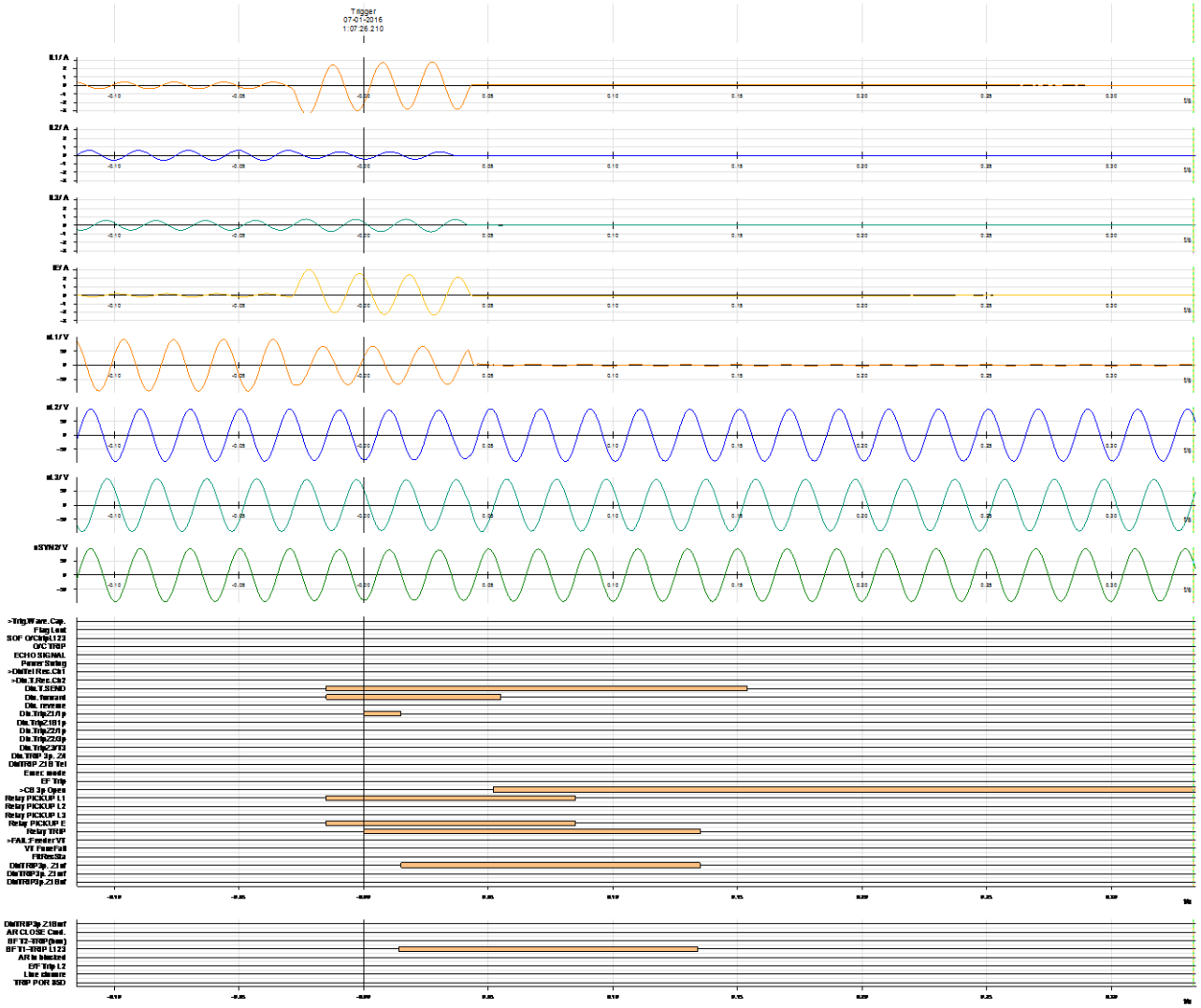
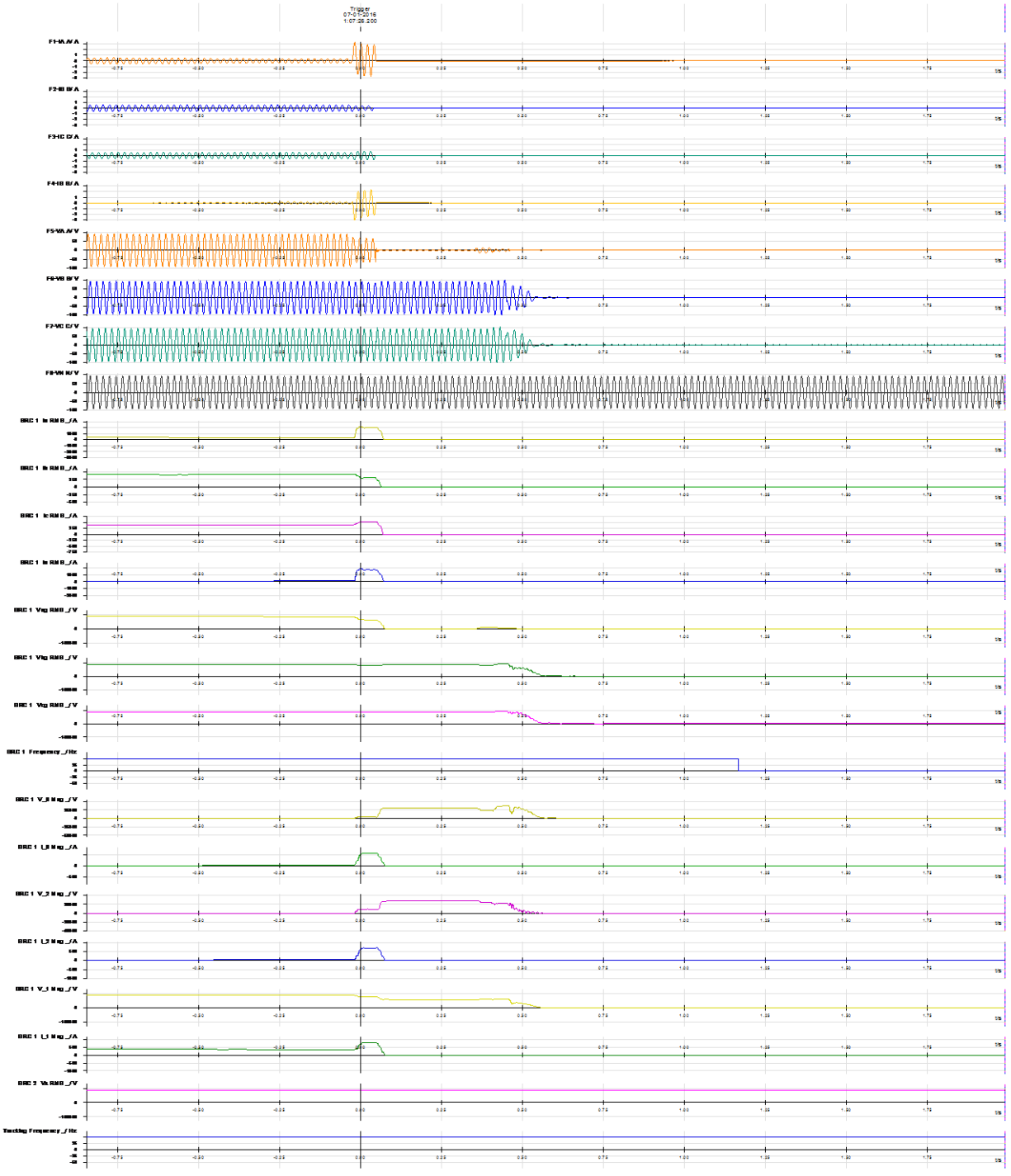


Figura 6: Registro de oscilografías y señales digitales

GE D60, paño A10, S/E Tinguiririca – Sistema 2 (01:07:26 horas).



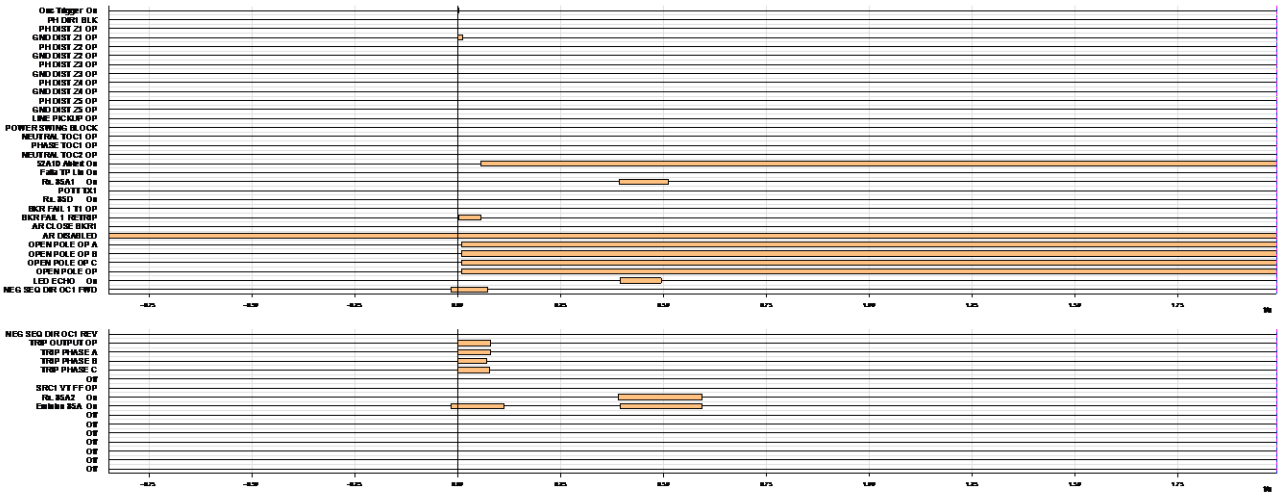
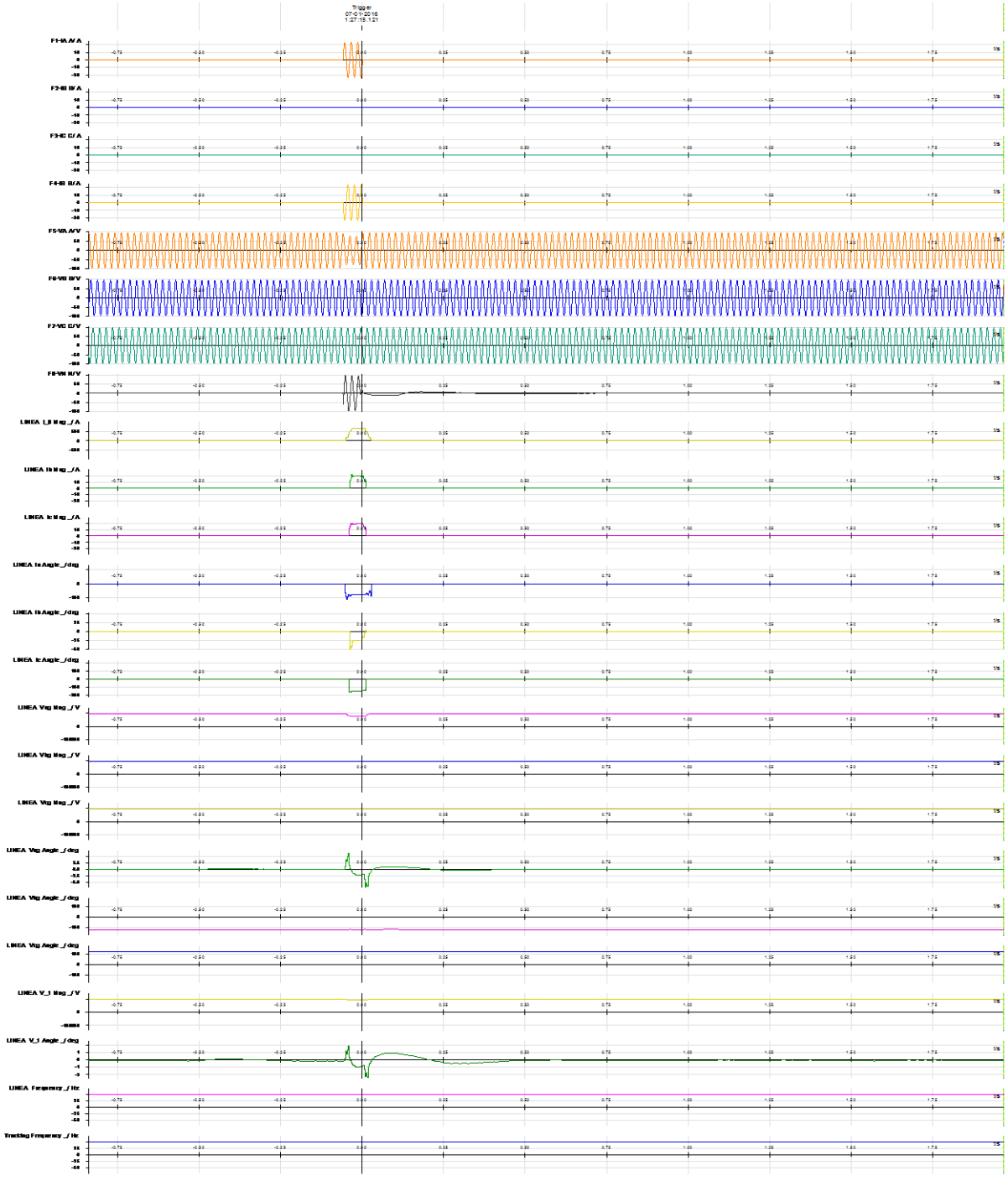

PH DIR1 BLK
PH DIST Z1 OP
GND DIST Z1 OP
PH DIST Z2 OP
GND DIST Z2 OP
PH DIST Z3 OP
GND DIST Z3 OP
PH DIST Z4 OP
GND DIST Z4 OP
PH DIST Z5 OP
GND DIST Z5 OP
LINE PICKUP OP
POWER SWING BLOCK
NEUTRAL TOC1 OP
PHASE TOC1 OP
NEUTRAL TOC2 OP
PHASE TOC2 OP
PUTT TX1
BKR FAIL 1 TI OP
AR CLOSE BKR1
AR DISABLED
OPEN POLE OP A
OPEN POLE OP B
OPEN POLE OP C
OPEN POLE OP
LED ECHO
NEG SEQ DIR OC1 FWD
NEG SEQ DIR OC1 REV
TRIP OUTPUT OP
TRIP PHASE A
TRIP PHASE B
TRIP PHASE C
SRC1 VT FF OP

Figura 7: Registro de oscilografías y señales digitales

GE D60, paño A2, S/E Alto Jahuel – Sistema 1 (01:27:15 horas).



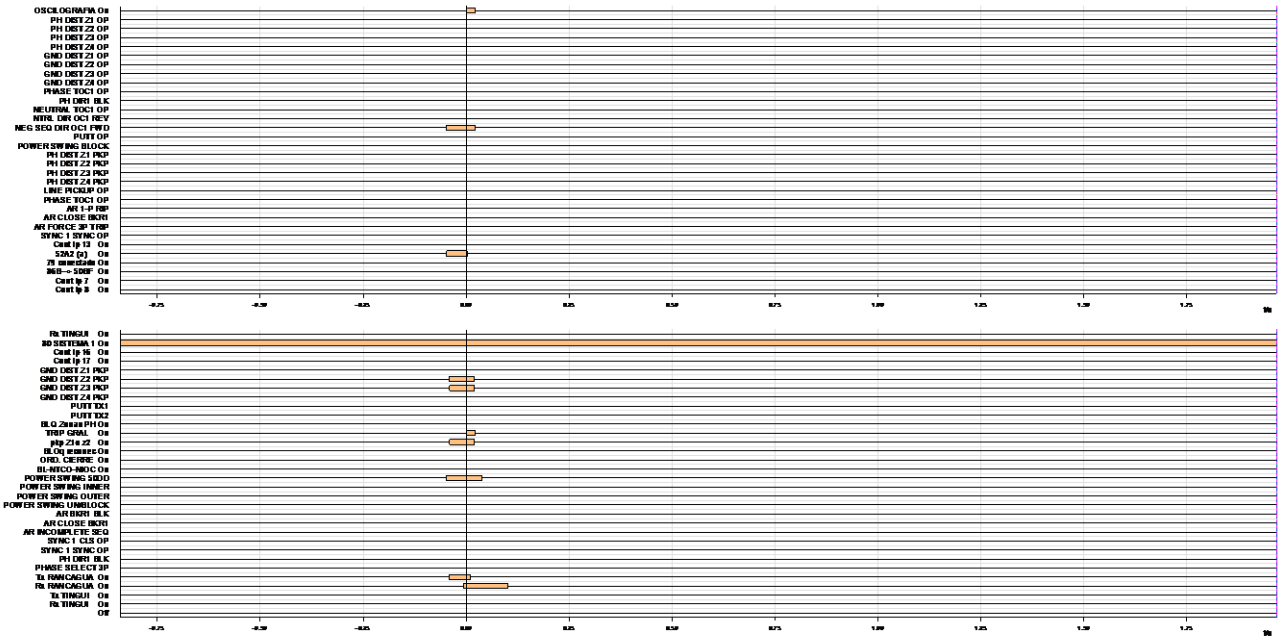

OSCILOGRAFIA On
PH DIST Z1 OP
PH DIST Z2 OP
PH DIST Z3 OP
PH DIST Z4 OP
GND DIST Z1 OP
GND DIST Z2 OP
GND DIST Z3 OP
GND DIST Z4 OP
PHASE TOC1 OP
PH DIR1 BLK
NEUTRAL TOC1 OP
NTRL DIR OC1 REV
NEG SEQ DIR OC1 FWD
PUTT OP
POWER SWING BLOCK
PH DIST Z1 PKP
PH DIST Z2 PKP
PH DIST Z3 PKP
PH DIST Z4 PKP
LINE PICKUP OP
PHASE TOC1 OP
AR 1-P RIP
AR CLOSE BKR1
AR FORCE 3P TRIP
SYNC 1 SYNC OP
Cont Ip 13 On
52A2 (a) On
Cont Ip 7 On
Cont Ip 8 On
Rx TINGUI On
80 SISTEMA 1 On
Cont Ip 16 On
Cont Ip 17 On
GND DIST Z1 PKP
GND DIST Z2 PKP
GND DIST Z3 PKP
GND DIST Z4 PKP
PUTT TX1
PUTT TX2
BLQ Zonas PH On
TRIP GRAL On
pkp Z1 e z2 On
ORD. CIERRE On
BL-NTCO-NIOC On
POWER SWING 50DD
POWER SWING INNER
POWER SWING OUTER
POWER SWING UNBLOCK
AR BKR1 BLK
AR CLOSE BKR1
AR INCOMPLETE SEQ
SYNC 1 CLS OP
SYNC 1 SYNC OP
PH DIR1 BLK
PHASE SELECT 3P
Tx RANCAGUA On
Rx RANCAGUA On
Tx TINGUI On
Rx TINGUI On
Off

Figura 8: Registro de oscilografías y señales digitales
Siemens 7SA612, paño A2, S/E Alto Jahuel – Sistema 2 (01:27:15 horas).

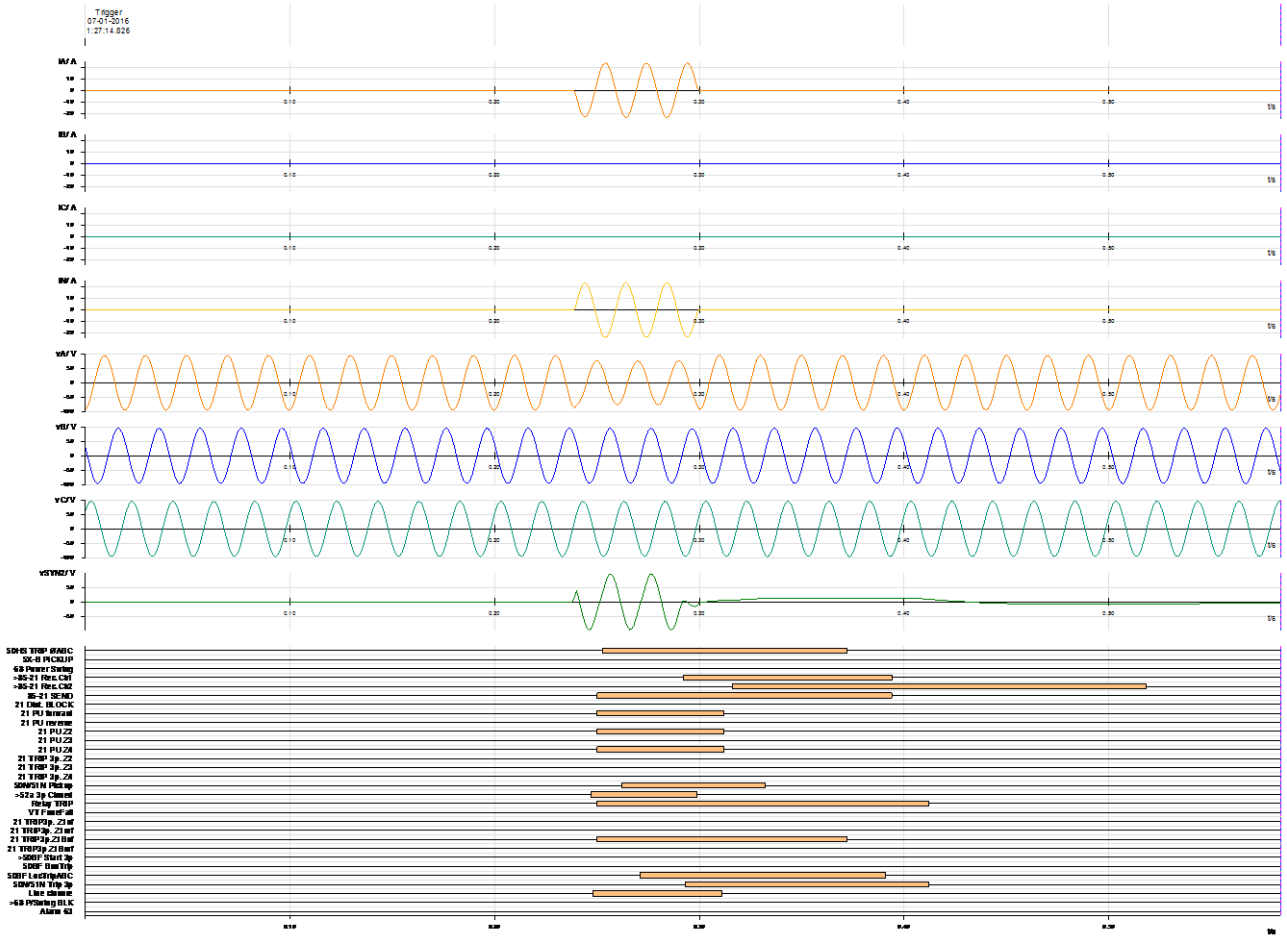
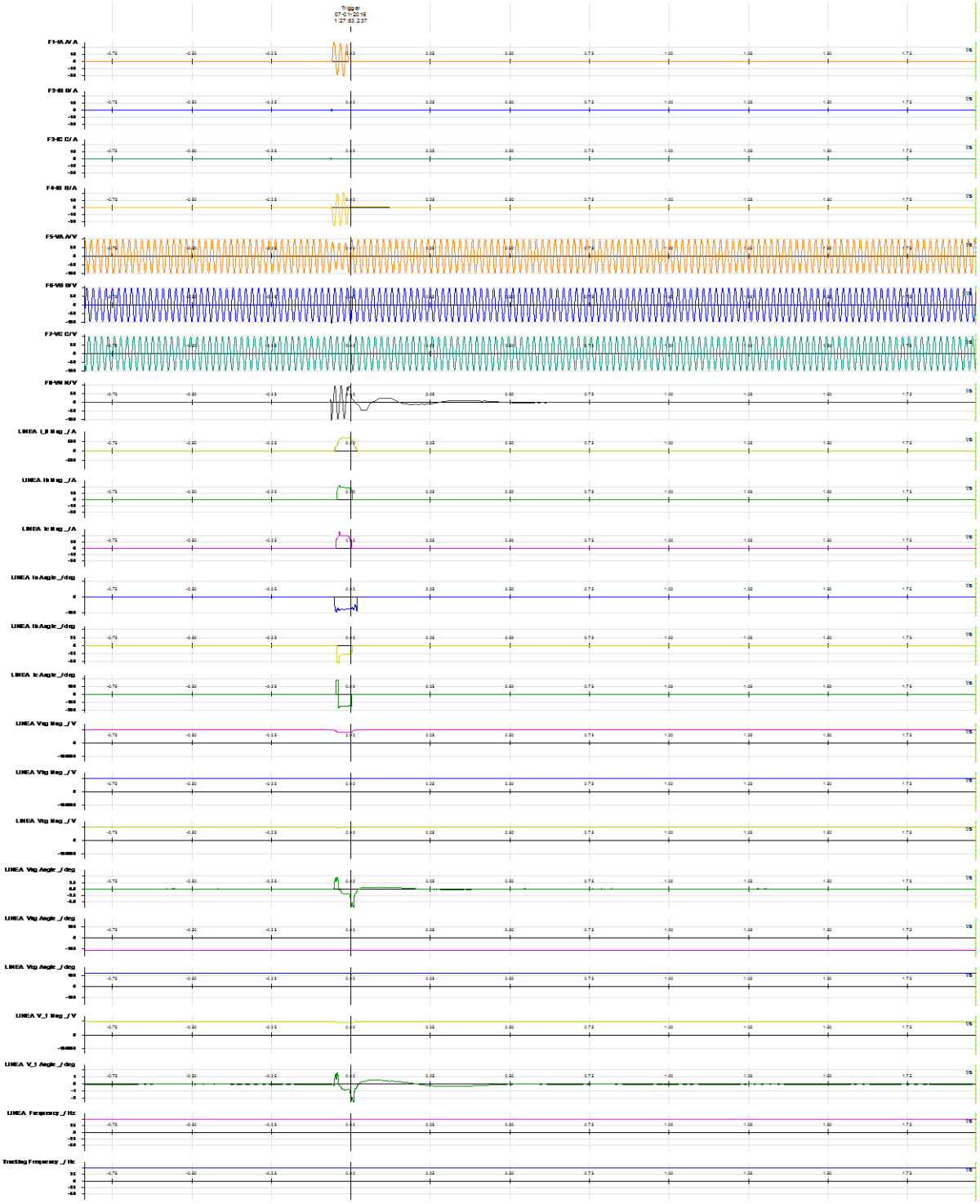


Figura 9: Registro de oscilografías y señales digitales
GE D60, paño A2, S/E Alto Jahuel – Sistema 1 (01:27:53 horas).



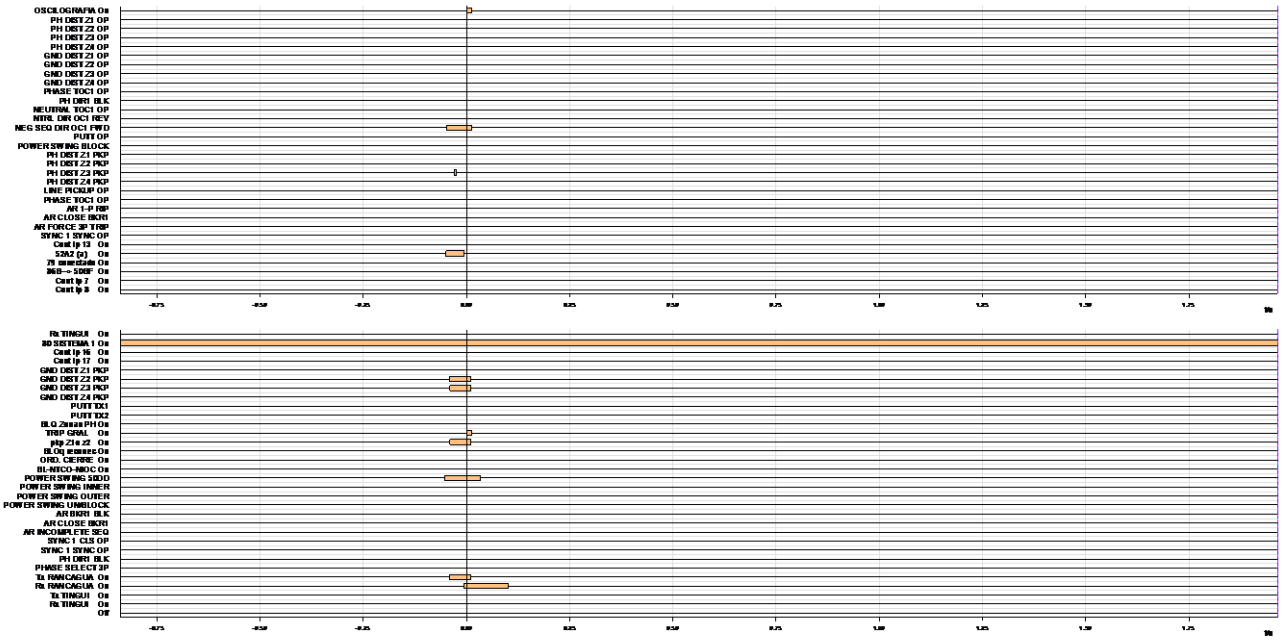

OSCILOGRAFIA On
PH DIST Z1 OP
PH DIST Z2 OP
PH DIST Z3 OP
PH DIST Z4 OP
GND DIST Z1 OP
GND DIST Z2 OP
GND DIST Z3 OP
GND DIST Z4 OP
PHASE TOC1 OP
PH DIR1 BLK
NEUTRAL TOC1 OP
NTRL DIR OC1 REV
NEG SEQ DIR OC1 FWD
PUTT OP
POWER SWING BLOCK
PH DIST Z1 PKP
PH DIST Z2 PKP
PH DIST Z3 PKP
PH DIST Z4 PKP
LINE PICKUP OP
PHASE TOC1 OP
AR 1-P RIP
AR CLOSE BKR1
AR FORCE 3P TRIP
SYNC 1 SYNC OP
Cont Ip 13 On
52A2 (a) On
Cont Ip 7 On
Cont Ip 8 On
Rx TINGUI On
3D SISTEMA 1 On
Cont Ip 16 On
Cont Ip 17 On
GND DIST Z1 PKP
GND DIST Z2 PKP
GND DIST Z3 PKP
GND DIST Z4 PKP
PUTT TX1
PUTT TX2
BLQ Zonas PH On
TRIP GRAL On
pkp Z1 o z2 On
BLOq resonec On
ORD. CIERRE On
BL-NTCO-NIOC On
POWER SWING 50DD
POWER SWING INNER
POWER SWING OUTER
POWER SWING UNBLOCK
AR BKR1 BLK
AR CLOSE BKR1
AR INCOMPLETE SEQ
SYNC 1 CLS OP
SYNC 1 SYNC OP
PH DIR1 BLK
PHASE SELECT 3P
Tx RANCAGUA On
Rx RANCAGUA On
Tx TINGUI On
Rx TINGUI On
OTF

Figura 10: Registro de oscilografías y señales digitales
Siemens 7SA612, paño A2, S/E Alto Jahuel – Sistema 2 (01:27:53 horas).

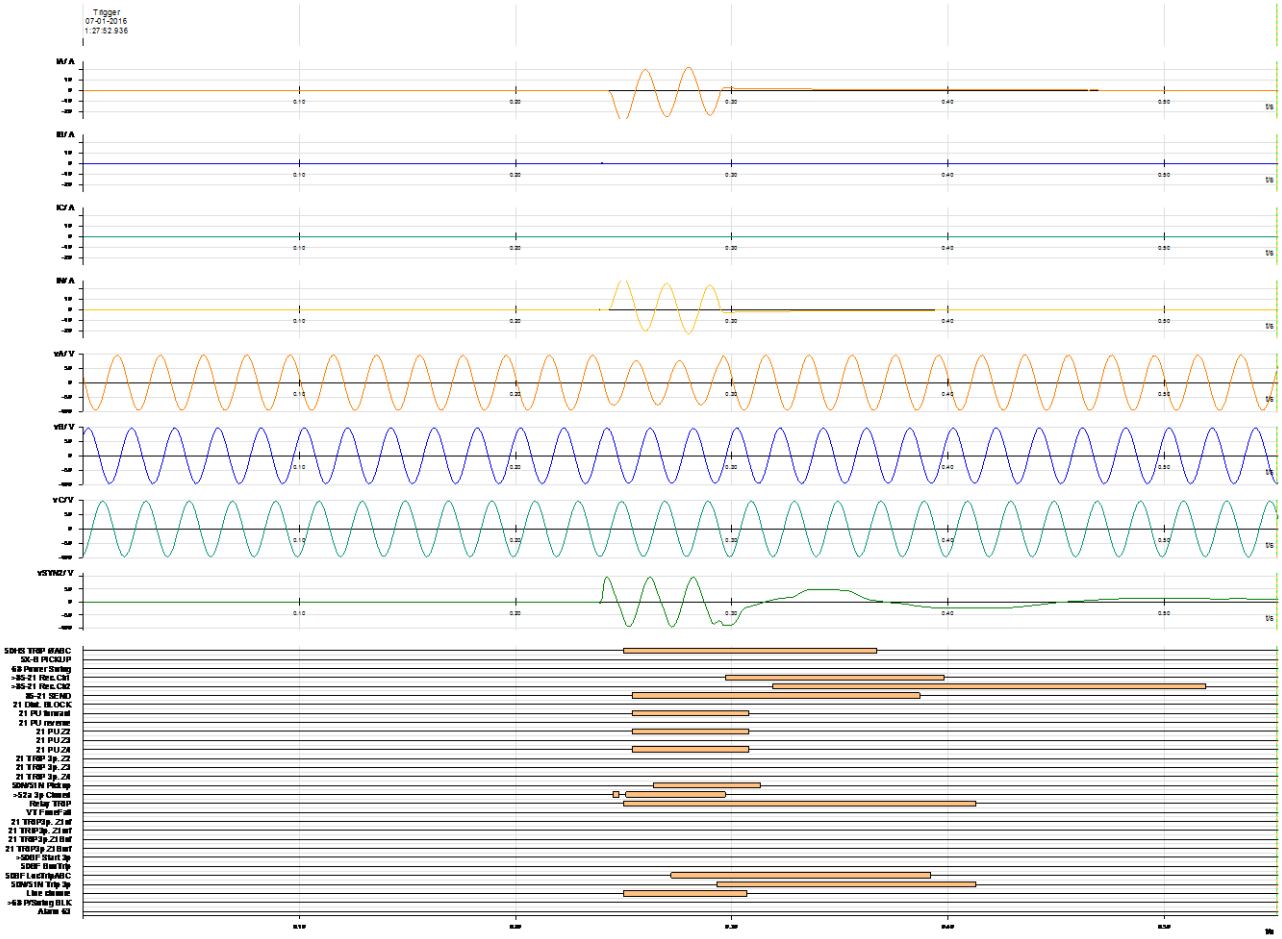
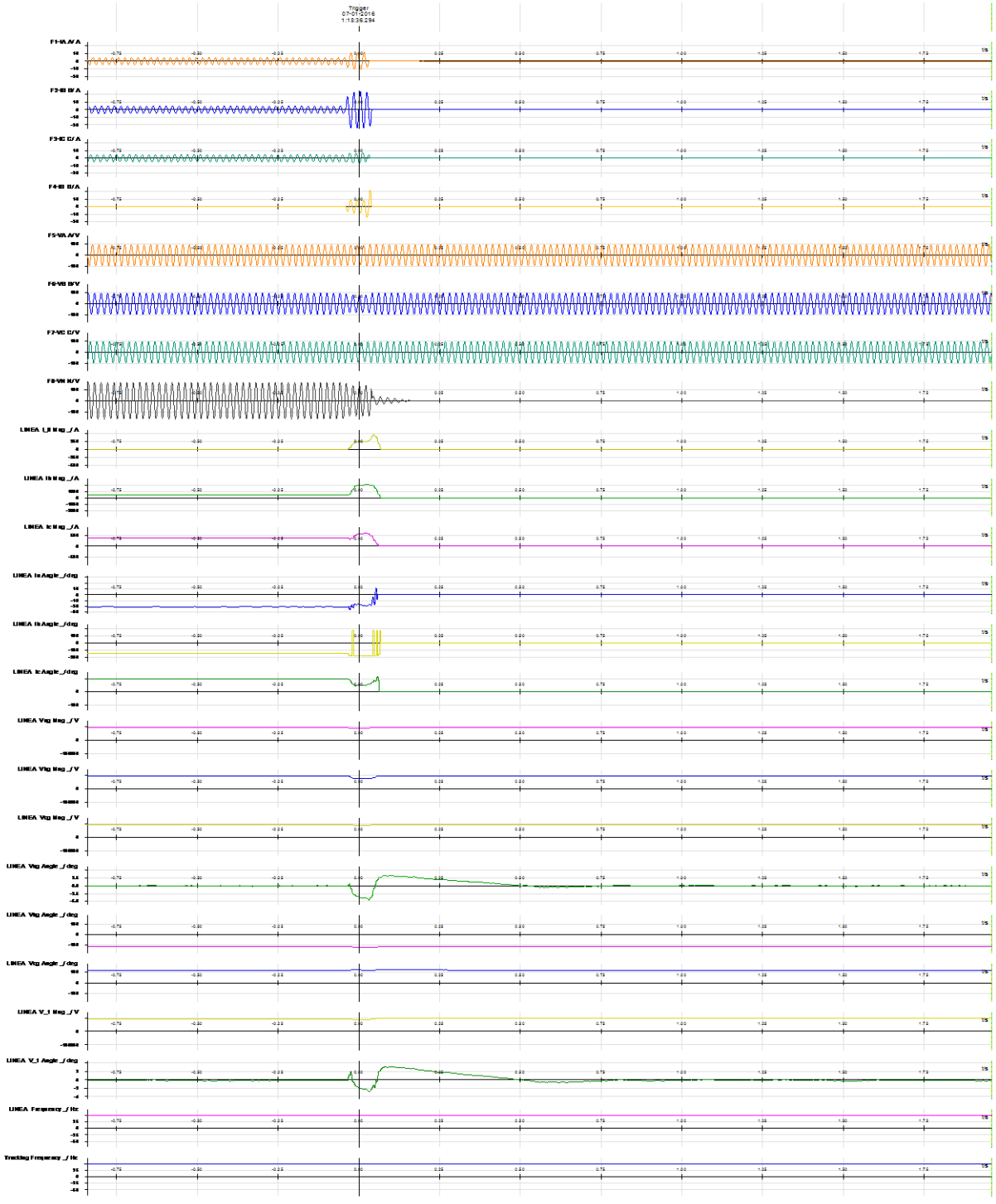


Figura 11: Registro de oscilografías y señales digitales
GE D60, paño A1, S/E Alto Jahuel – Sistema 1 (01:18 horas).



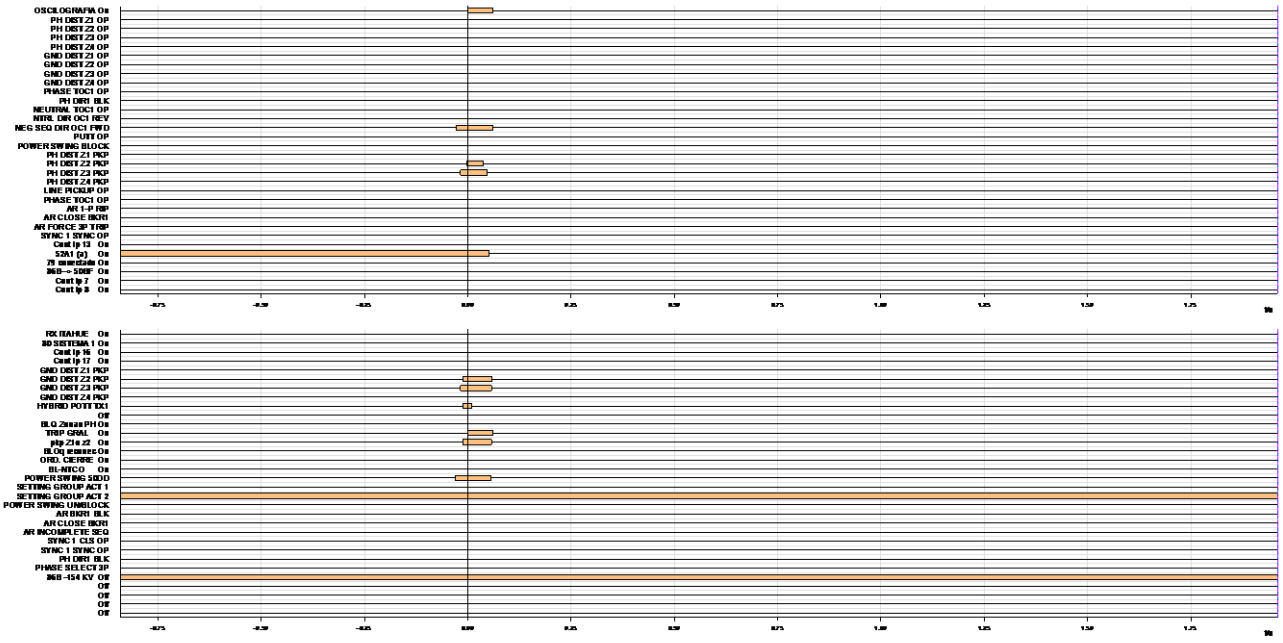

OSCILOGRAFIA On
PH DIST Z1 OP
PH DIST Z2 OP
PH DIST Z3 OP
PH DIST Z4 OP
GND DIST Z1 OP
GND DIST Z2 OP
GND DIST Z3 OP
GND DIST Z4 OP
PHASE TOC1 OP
PH DIR1 BLK
NEUTRAL TOC1 OP
NTRL DIR OC1 REV
NEG SEQ DIR OC1 FWD
PUTT OP
POWER SWING BLOCK
PH DIST Z1 PKP
PH DIST Z2 PKP
PH DIST Z3 PKP
PH DIST Z4 PKP
LINE PICKUP OP
PHASE TOC1 OP
AR 1-P RIP
AR CLOSE BKR1
AR FORCE 3P TRIP
SYNC 1 SYNC OP
Cont Ip 13 On
52A1 (a) On
Cont Ip 7 On
Cont Ip 8 On
RX ITAHUE On
Cont Ip 16 On
Cont Ip 17 On
GND DIST Z1 PKP
GND DIST Z2 PKP
GND DIST Z3 PKP
GND DIST Z4 PKP
HYBRID POTT TX1
Off
TRIP GRAL On
ORD. CIERRE On
BL-NTCO On
POWER SWING 50DD
SETTING GROUP ACT 1
SETTING GROUP ACT 2
POWER SWING UNBLOCK
AR BKR1 BLK
AR CLOSE BKR1
AR INCOMPLETE SEQ
SYNC 1 CLS OP
SYNC 1 SYNC OP
PH DIR1 BLK
PHASE SELECT 3P
Off
Off
Off
Off

Figura 12: Registro de oscilografías y señales digitales
Siemens 7SA612, paño A1, S/E Alto Jahuel – Sistema 2 (01:18 horas).

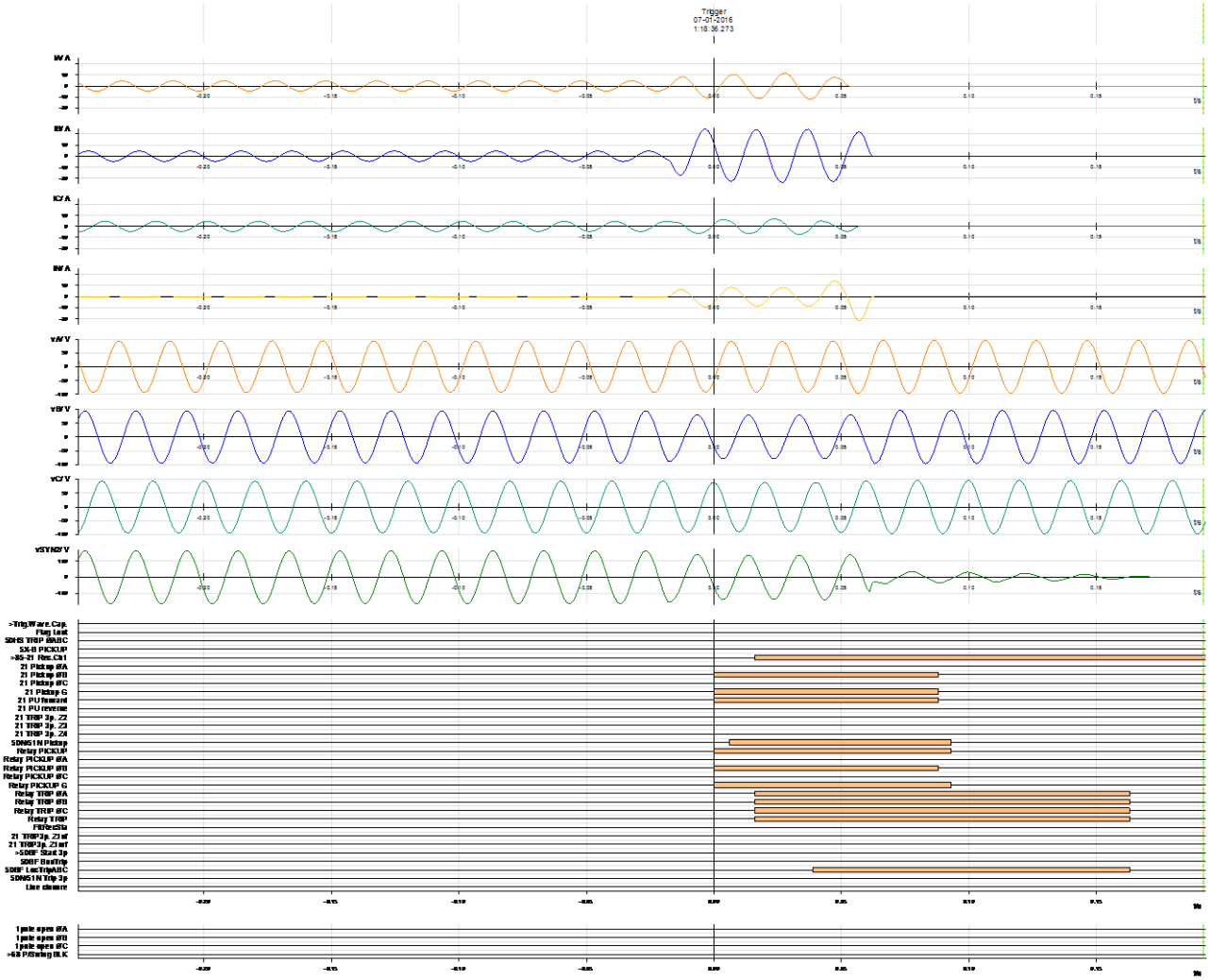


Figura 13: Registro de oscilografías y señales digitales
Siemens 7SA612, paño A2, S/E Rancagua – Sistema 1 (01:18 horas).

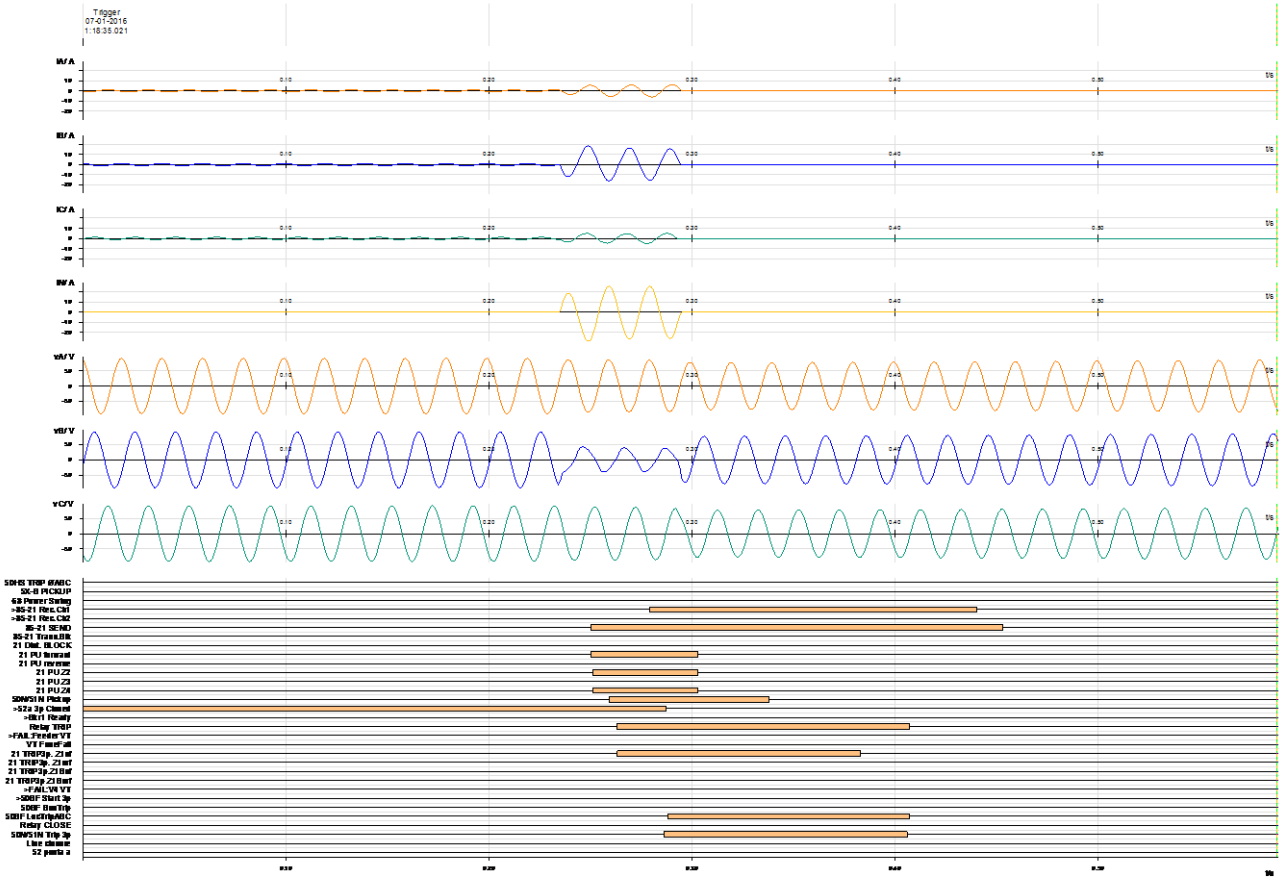
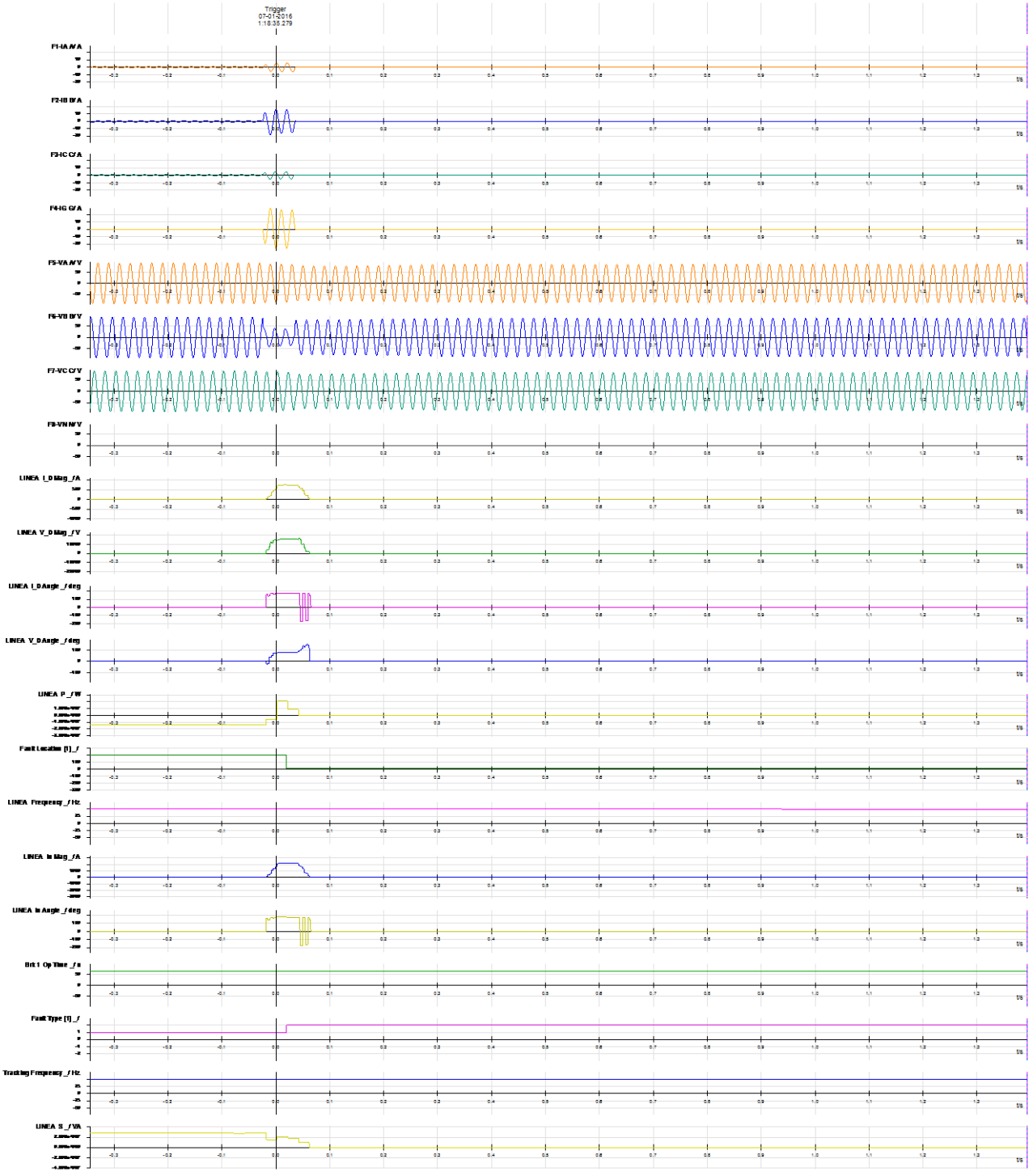
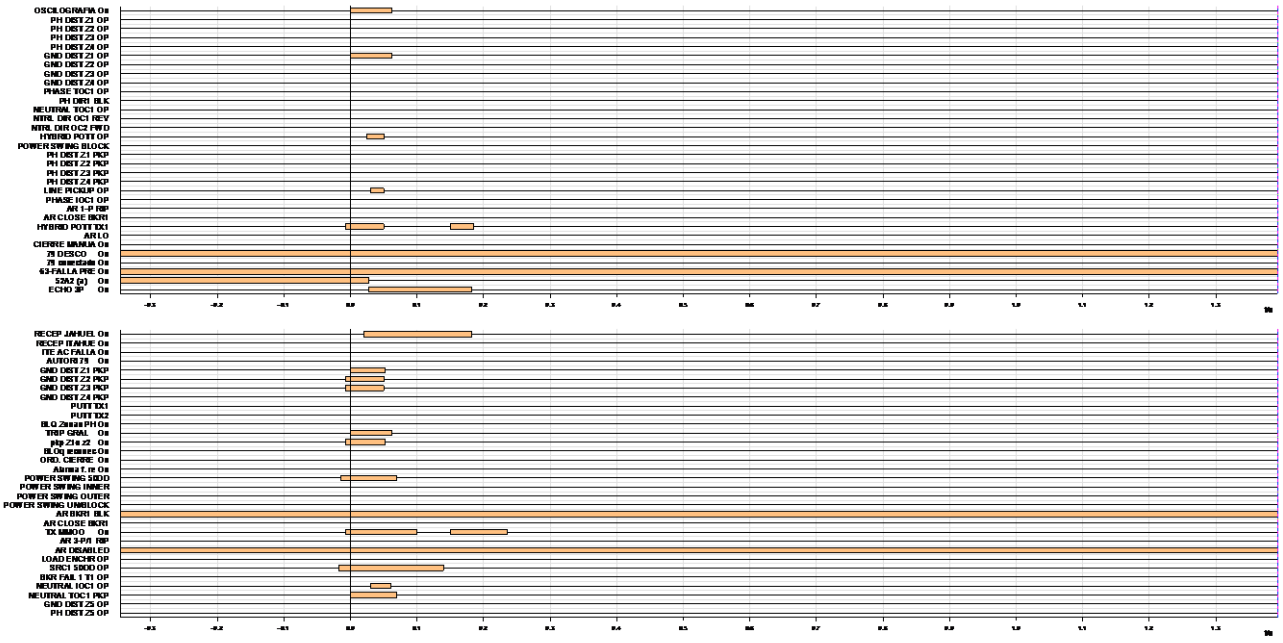


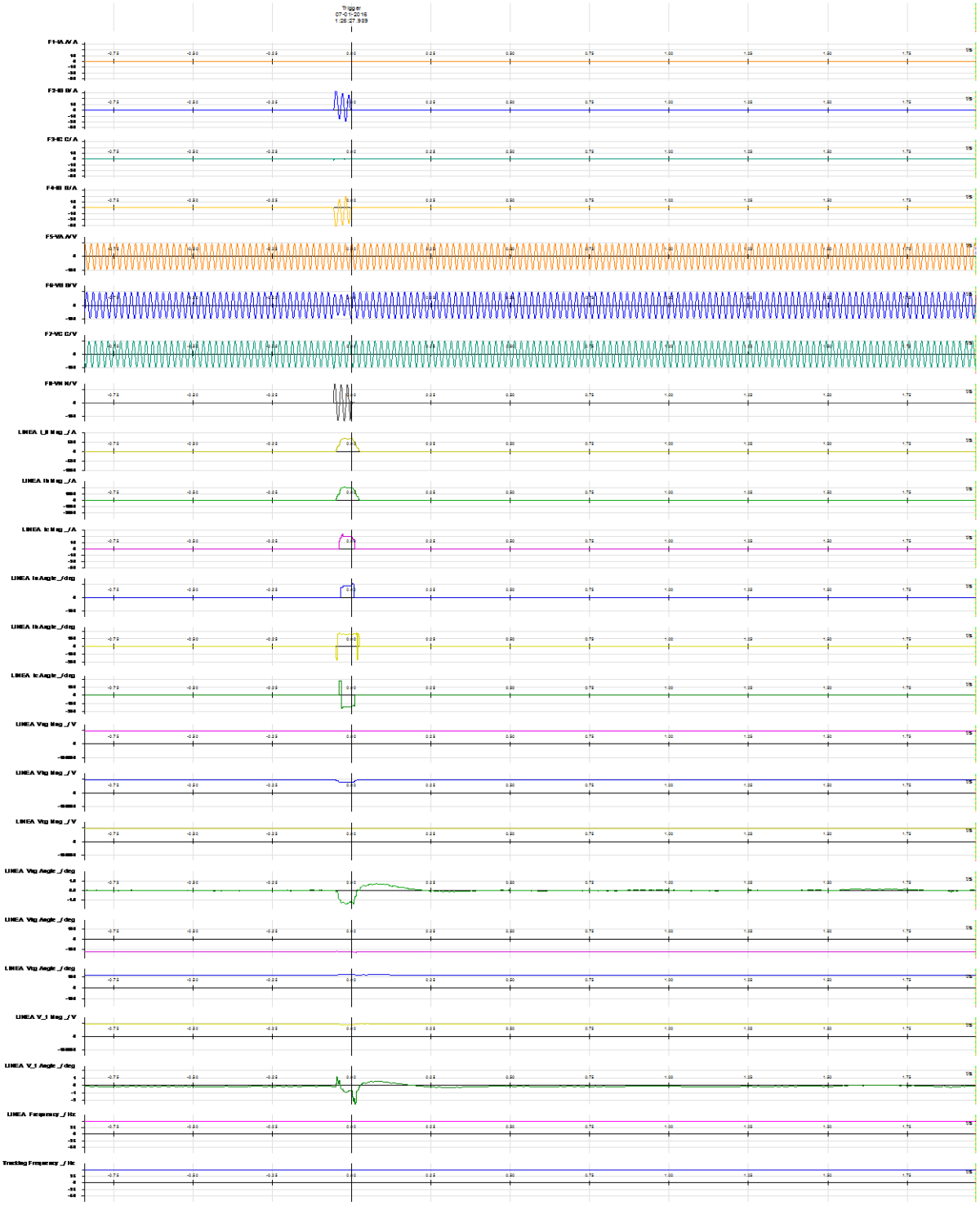
Figura 14: Registro de oscilografías y señales digitales
GE D60, paño A2, S/E Rancagua – Sistema 2 (01:18 horas).




OSCILOGRAFIA Os
PH DIST Z1 OP
PH DIST Z2 OP
PH DIST Z3 OP
PH DIST Z4 OP
GND DIST Z1 OP
GND DIST Z2 OP
GND DIST Z3 OP
GND DIST Z4 OP
PHASE TOC1 OP
PH DIR1 BLK
NEUTRAL TOC1 OP
NTRL DIR OC1 REV
NTRL DIR OC2 FWD
HYBRID POTT OP
POWER SWING BLOCK
PH DIST Z1 PKP
PH DIST Z2 PKP
PH DIST Z3 PKP
PH DIST Z4 PKP
LINE PICKUP OP
PHASE IOC1 OP
AR 1-P RIP
AR CLOSE BKR1
HYBRID POTT TX1
AR LO
CIERRE MANUA Os
79 DESCO Os
79 bloqueado Os
63-FALLA PRE Os
SWI (p) Os
ECHO 3P Os

RECEP JAHUEL Os
RECEP ITAHUE Os
TIE AC FALLA Os
AUTORIZ 79 Os
GND DIST Z1 PKP
GND DIST Z2 PKP
GND DIST Z3 PKP
GND DIST Z4 PKP
PUTT TX1
PUTT TX2
BLQ 2do nivel PH Os
TRIP GRAL Os
pkp Z1 o Z2 Os
BLQ reenvios Os
ORD. CIERRE Os
Alarma T. re Os
POWER SWING SIDD
POWER SWING INNER
POWER SWING OUTER
POWER SWING UNBLOCK
AR DIR1 BLK
AR CLOSE BKR1
TX MANDO Os
AR 3-P/1 RIP
AR DISABLED
LOAD ENCASH OP
SIRC1 SIDD OP
BKR FAIL 1 TI OP
NEUTRAL TOC1 OP
NEUTRAL TOC1 PKP
GND DIST Z5 OP
PH DIST Z5 OP

Figura 15: Registro de oscilografías y señales digitales
GE D60, paño A1, S/E Alto Jahuel – Sistema 1 (01:26:27 horas).



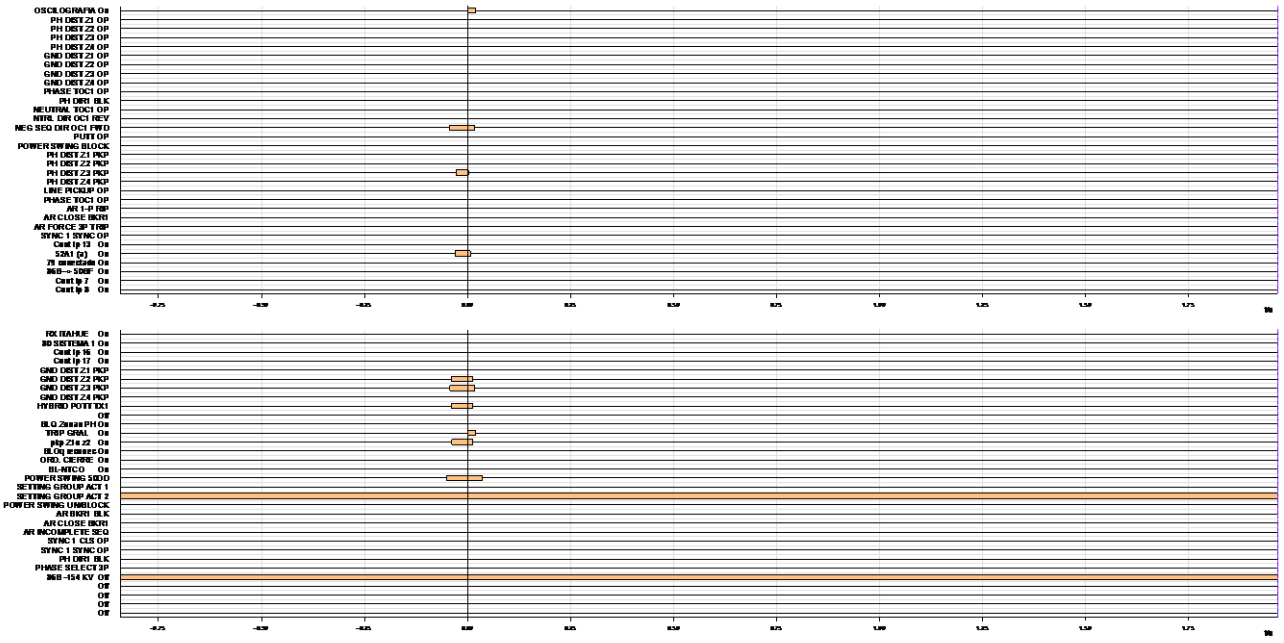
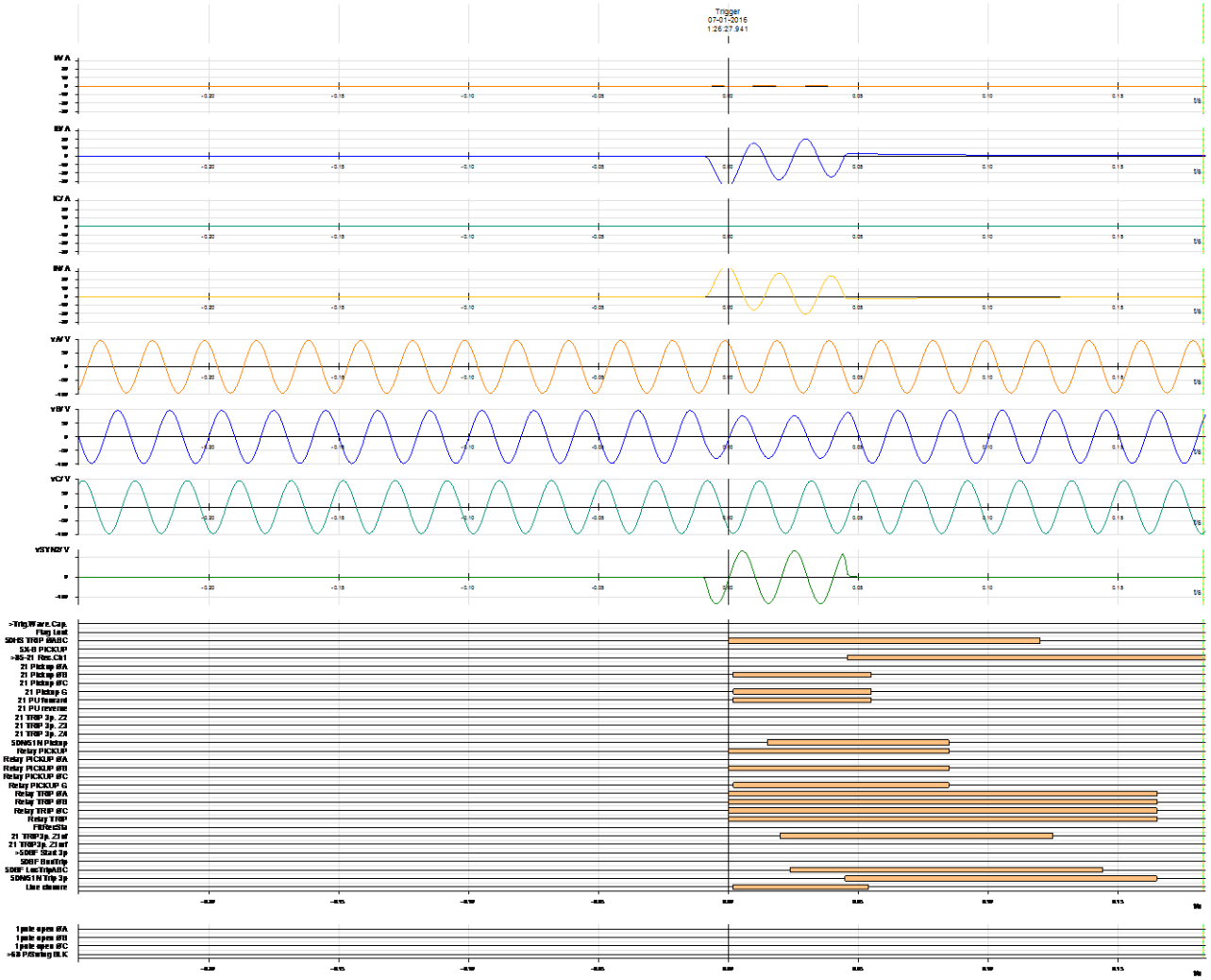

OSCILOGRAFIA On
PH DIST Z1 OP
PH DIST Z2 OP
PH DIST Z3 OP
PH DIST Z4 OP
GND DIST Z1 OP
GND DIST Z2 OP
GND DIST Z3 OP
GND DIST Z4 OP
PHASE TOC1 OP
PH DIR1 BLK
NEUTRAL TOC1 OP
NTRL DIR OC1 REV
NEG SEQ DIR OC1 FWD
PUTT OP
POWER SWING BLOCK
PH DIST Z1 PKP
PH DIST Z2 PKP
PH DIST Z3 PKP
PH DIST Z4 PKP
LINE PICKUP OP
PHASE TOC1 OP
AR 1-P RIP
AR CLOSE BKR1
AR FORCE 3P TRIP
SYNC 1 SYNC OP
Cont Ip 13 On
52A1 (a) On
Cont Ip 7 On
Cont Ip 8 On
RX ITAHUE On
Cont Ip 16 On
Cont Ip 17 On
GND DIST Z1 PKP
GND DIST Z2 PKP
GND DIST Z3 PKP
GND DIST Z4 PKP
HYBRID POTT TX1
Off
BLQ 2nnan PH On
TRIP GRAL On
BLOq resonec On
ORD. CIERRE On
BL-NTCO On
POWER SWING 5DDD
SETTING GROUP ACT 1
SETTING GROUP ACT 2
POWER SWING UNBLOCK
AR BKR1 BLK
AR CLOSE BKR1
AR INCOMPLETE SEQ
SYNC 1 CLS OP
SYNC 1 SYNC OP
PH DIR1 BLK
PHASE SELECT 3P
Off
Off
Off
Off

Figura 16: Registro de oscilografías y señales digitales
Siemens 7SA612, paño A1, S/E Alto Jahuel – Sistema 2 (01:26:27 horas).



Anexo 3: Registro de eventos

Figura 17: Registro de eventos

GE D60, paño A2, S/E Alto Jahuel – Sistema 1.

Event Number	Date/Time	Cause	Data
15071931	Jan 07 2016 01:07:26.634130	TRIP PHASE C	
15071930	Jan 07 2016 01:07:26.634130	TRIP PHASE B	
15071929	Jan 07 2016 01:07:26.634130	TRIP PHASE A	
15071928	Jan 07 2016 01:07:26.631631	URT TRIP S1 On	
15071927	Jan 07 2016 01:07:26.631631	PARA PRUEBAS On	
15071926	Jan 07 2016 01:07:26.631631	URT OPE Z1 On	
15071925	Jan 07 2016 01:07:26.631631	TRIP BD1 On	
15071924	Jan 07 2016 01:07:26.631631	OSCILLOGRAPHY TRIG'D	
15071923	Jan 07 2016 01:07:26.631631	Partida 79 On	
15071922	Jan 07 2016 01:07:26.631631	OSCILOGRAFIA On	
15071921	Jan 07 2016 01:07:26.631631	TRIP GRAL On	
15071920	Jan 07 2016 01:07:26.631631	GND DIST Z1 OP A	
15071919	Jan 07 2016 01:07:26.631631	GND DIST Z1 PKP A	
15071918	Jan 07 2016 01:07:26.586664	RECEP ACELER On	
15071917	Jan 07 2016 01:07:26.584579	Rx RANCAGUA On	
15071916	Jan 07 2016 01:07:26.584167	PH DIST Z3 PKP CA	
15071915	Jan 07 2016 01:07:26.581672	PHASE TOC1 PKP A	
15071914	Jan 07 2016 01:07:26.581672	NEUTRAL TOC1 PKP	
15071913	Jan 07 2016 01:07:26.579174	GND DIST Z3 PKP A	
15071912	Jan 07 2016 01:07:26.579174	PH DIST Z5 PKP CA	
15071911	Jan 07 2016 01:07:26.579174	PH DIST Z5 PKP AB	
15071910	Jan 07 2016 01:07:26.579174	PH DIST Z2 PKP CA	
15071909	Jan 07 2016 01:07:26.579174	PH DIST Z2 PKP AB	
15071908	Jan 07 2016 01:07:26.576681	FAULT RPT TRIG	
15071907	Jan 07 2016 01:07:26.576681	RESET OP(OPERAND)	
15071906	Jan 07 2016 01:07:26.574184	Tx RANCAGUA On	
15071905	Jan 07 2016 01:07:26.574184	Tx TINGUI On	
15071904	Jan 07 2016 01:07:26.574184	Tx TINGUI On	
15071903	Jan 07 2016 01:07:26.574184	Tx RANCAGUA On	
15071902	Jan 07 2016 01:07:26.574184	reset led On	
15071901	Jan 07 2016 01:07:26.574184	pkp Z1o z2 On	
15071900	Jan 07 2016 01:07:26.574184	HYBRID POTT TX1	
15071899	Jan 07 2016 01:07:26.574184	GND DIST Z5 PKP A	
15071898	Jan 07 2016 01:07:26.574184	GND DIST Z2 PKP A	
15071897	Jan 07 2016 01:07:26.571689	NEG SEQ DIR OC1 FWD	
15071896	Jan 07 2016 01:07:26.521753	reset led Off	
15071895	Jan 07 2016 01:07:26.521753	NEUTRAL TOC1 DPO	
15071894	Jan 07 2016 01:07:26.373035	Rx TINGUI Off	
15071893	Jan 07 2016 01:07:26.207006	Rx TINGUI On	
15071892	Jan 07 2016 01:07:26.204605	RESET OP(OPERAND)	
15071891	Jan 07 2016 01:07:26.202108	reset led On	
15071890	Jan 07 2016 01:07:26.202108	NEUTRAL TOC1 PKP	

Event Number	Date/Time	Cause	Data
15071973	Jan 07 2016 01:27:15.081284	Tx RANCAGUA On	
15071972	Jan 07 2016 01:27:15.081284	reset led On	
15071971	Jan 07 2016 01:27:15.081284	pkp Z1o z2 On	
15071970	Jan 07 2016 01:27:15.081284	HYBRID POTT TX1	
15071969	Jan 07 2016 01:27:15.081284	GND DIST Z3 PKP A	
15071968	Jan 07 2016 01:27:15.081284	GND DIST Z2 PKP A	
15071967	Jan 07 2016 01:27:15.073778	NEG SEQ DIR OC1 FWD	
15071966	Jan 07 2016 01:27:15.071155	52A2 (a) On	
15071965	Jan 07 2016 01:24:35.756785	RESET OP(PUSHBUTTON)	
15071964	Jan 07 2016 01:13:02.519817	SETTING GROUP ACT 2	
15071963	Jan 07 2016 01:13:02.517306	CAMBIO G1-G2 On	
15071962	Jan 07 2016 01:13:00.512307	CHANGE GRP Off	
15071961	Jan 07 2016 01:07:26.741520	RECEP ACELER Off	
15071960	Jan 07 2016 01:07:26.739119	Rx RANCAGUA Off	
15071959	Jan 07 2016 01:07:26.691591	reset led Off	
15071958	Jan 07 2016 01:07:26.691591	PHASE TOC1 DPO A	
15071957	Jan 07 2016 01:07:26.691591	NEUTRAL TOC1 DPO	
15071956	Jan 07 2016 01:07:26.689109	URT TRIP S1 Off	
15071955	Jan 07 2016 01:07:26.689109	PARA PRUEBAS Off	
15071954	Jan 07 2016 01:07:26.689109	URT OPE Z1 Off	
15071953	Jan 07 2016 01:07:26.689109	RETRIP 50BF Off	
15071952	Jan 07 2016 01:07:26.689109	TRIP BD1 Off	
15071951	Jan 07 2016 01:07:26.689109	Partida 79 Off	
15071950	Jan 07 2016 01:07:26.689109	pkp Z1o z2 Off	
15071949	Jan 07 2016 01:07:26.689109	OSCILOGRAFIA Off	
15071948	Jan 07 2016 01:07:26.689109	TRIP GRAL Off	
15071947	Jan 07 2016 01:07:26.689109	GND DIST Z2 DPO A	
15071946	Jan 07 2016 01:07:26.684113	GND DIST Z5 DPO A	
15071945	Jan 07 2016 01:07:26.679114	GND DIST Z3 DPO A	
15071944	Jan 07 2016 01:07:26.679114	PH DIST Z5 DPO CA	
15071943	Jan 07 2016 01:07:26.679114	PH DIST Z2 DPO CA	
15071942	Jan 07 2016 01:07:26.679114	PH DIST Z2 DPO AB	
15071941	Jan 07 2016 01:07:26.674115	GND DIST Z1 DPO A	
15071940	Jan 07 2016 01:07:26.674115	PH DIST Z5 DPO AB	
15071939	Jan 07 2016 01:07:26.674115	PH DIST Z3 DPO CA	
15071938	Jan 07 2016 01:07:26.662593	52A2 (a) Off	
15071937	Jan 07 2016 01:07:26.646622	Tx RANCAGUA Off	
15071936	Jan 07 2016 01:07:26.646622	Tx TINGUI Off	
15071935	Jan 07 2016 01:07:26.646622	Tx TINGUI Off	
15071934	Jan 07 2016 01:07:26.646622	Tx RANCAGUA Off	
15071933	Jan 07 2016 01:07:26.634130	RETRIP 50BF On	
15071932	Jan 07 2016 01:07:26.634130	TRIP 3-POLE	

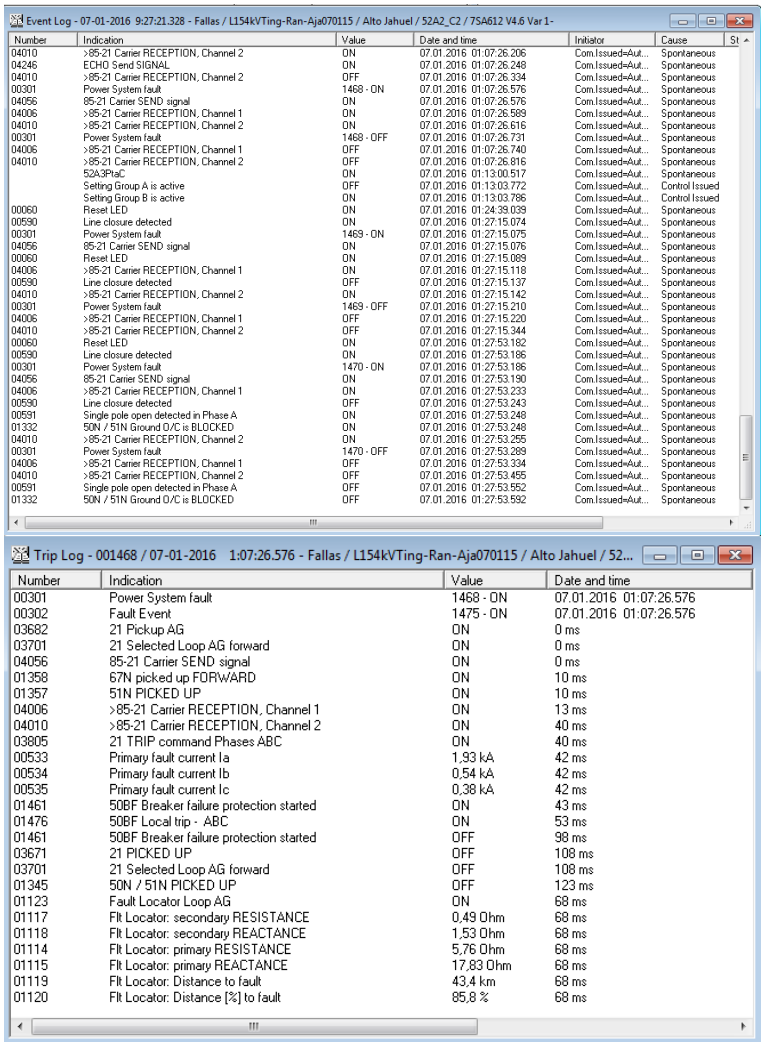
Event Number	Date/Time	Cause	Data
15072015	Jan 07 2016 01:27:15.153909	reset led Off	
15072014	Jan 07 2016 01:27:15.153909	NEUTRAL TOC1 DPO	
15072013	Jan 07 2016 01:27:15.148901	RETRIP 50BF Off	
15072012	Jan 07 2016 01:27:15.143891	URT TRIP S1 Off	
15072011	Jan 07 2016 01:27:15.143891	PARA PRUEBAS Off	
15072010	Jan 07 2016 01:27:15.143891	TRIP BD1 Off	
15072009	Jan 07 2016 01:27:15.143891	OSCILOGRAFIA Off	
15072008	Jan 07 2016 01:27:15.143891	TRIP GRAL Off	
15072007	Jan 07 2016 01:27:15.143891	PHASE TOC1 DPO A	
15072006	Jan 07 2016 01:27:15.141386	POTT OP 2T Off	
15072005	Jan 07 2016 01:27:15.141386	pkp Z1o z2 Off	
15072004	Jan 07 2016 01:27:15.141386	GND DIST Z3 DPO A	
15072003	Jan 07 2016 01:27:15.141386	GND DIST Z2 DPO A	
15072002	Jan 07 2016 01:27:15.138883	50-50N Off	
15072001	Jan 07 2016 01:27:15.138883	NEUTRAL IOC1 DPO	
15072000	Jan 07 2016 01:27:15.131367	Tx RANCAGUA Off	
15071999	Jan 07 2016 01:27:15.131367	Tx RANCAGUA Off	
15071998	Jan 07 2016 01:27:15.128863	50-50N On	
15071997	Jan 07 2016 01:27:15.128863	NEUTRAL IOC1 OP	
15071996	Jan 07 2016 01:27:15.123853	ECHO COND 2T On	
15071995	Jan 07 2016 01:27:15.120164	52A2 (a) Off	
15071994	Jan 07 2016 01:27:15.121347	URT TRIP S1 On	
15071993	Jan 07 2016 01:27:15.121347	PARA PRUEBAS On	
15071992	Jan 07 2016 01:27:15.121347	TRIP BD1 On	
15071991	Jan 07 2016 01:27:15.121347	OSCILLOGRAPHY TRIG'D	
15071990	Jan 07 2016 01:27:15.121347	OSCILOGRAFIA On	
15071989	Jan 07 2016 01:27:15.121347	TRIP GRAL On	
15071988	Jan 07 2016 01:27:15.118844	RETRIP 50BF On	
15071987	Jan 07 2016 01:27:15.118844	POTT OP 2T On	
15071986	Jan 07 2016 01:27:15.118844	TRIP 3-POLE	
15071985	Jan 07 2016 01:27:15.118844	TRIP PHASE A	
15071984	Jan 07 2016 01:27:15.116337	URT REC ACEL On	
15071983	Jan 07 2016 01:27:15.116337	RECEPCION On	
15071982	Jan 07 2016 01:27:15.116337	RECEPCION 2T On	
15071981	Jan 07 2016 01:27:15.116337	RECEP ACELER On	
15071980	Jan 07 2016 01:27:15.113661	Rx RANCAGUA On	
15071979	Jan 07 2016 01:27:15.098802	NEUTRAL IOC1 PKP	
15071978	Jan 07 2016 01:27:15.093795	PHASE TOC1 PKP A	
15071977	Jan 07 2016 01:27:15.083786	FAULT RPT TRIG	
15071976	Jan 07 2016 01:27:15.083786	NEUTRAL TOC1 PKP	
15071975	Jan 07 2016 01:27:15.083786	RESET OP(OPERAND)	
15071974	Jan 07 2016 01:27:15.081284	Tx RANCAGUA On	

Event Number	Date/Time	Cause	Data
15072057	Jan 07 2016 01:27:53.247363	GND DIST Z3 DPO A	
15072056	Jan 07 2016 01:27:53.247363	GND DIST Z2 DPO A	
15072055	Jan 07 2016 01:27:53.244862	NEUTRAL IOC1 DPO	
15072054	Jan 07 2016 01:27:53.237360	URT TRIP S1 On	
15072053	Jan 07 2016 01:27:53.237360	PARA PRUEBAS On	
15072052	Jan 07 2016 01:27:53.237360	TRIP BD1 On	
15072051	Jan 07 2016 01:27:53.237360	OSCILLOGRAPHY TRIG'D	
15072050	Jan 07 2016 01:27:53.237360	OSCILOGRAFIA On	
15072049	Jan 07 2016 01:27:53.237360	TRIP GRAL On	
15072048	Jan 07 2016 01:27:53.234859	RETRIP 50BF On	
15072047	Jan 07 2016 01:27:53.234859	POTT OP 2T On	
15072046	Jan 07 2016 01:27:53.234859	TRIP 3-POLE	
15072045	Jan 07 2016 01:27:53.234859	TRIP PHASE A	
15072044	Jan 07 2016 01:27:53.232357	URT REC ACEL On	
15072043	Jan 07 2016 01:27:53.232357	ECHO COND 2T On	
15072042	Jan 07 2016 01:27:53.232357	RECEPCION On	
15072041	Jan 07 2016 01:27:53.232357	RECEPCION 2T On	
15072040	Jan 07 2016 01:27:53.232357	RECEP ACELER On	
15072039	Jan 07 2016 01:27:53.228485	Rx RANCAGUA On	
15072038	Jan 07 2016 01:27:53.227984	52A2 (a) Off	
15072037	Jan 07 2016 01:27:53.212351	PH DIST Z3 DPO CA	
15072036	Jan 07 2016 01:27:53.209851	PHASE TOC1 PKP A	
15072035	Jan 07 2016 01:27:53.209851	NEUTRAL IOC1 PKP	
15072034	Jan 07 2016 01:27:53.207351	PH DIST Z3 PKP CA	
15072033	Jan 07 2016 01:27:53.199858	FAULT RPT TRIG	
15072032	Jan 07 2016 01:27:53.199858	NEUTRAL TOC1 PKP	
15072031	Jan 07 2016 01:27:53.199858	RESET OP(OPERAND)	
15072030	Jan 07 2016 01:27:53.197360	Tx RANCAGUA On	
15072029	Jan 07 2016 01:27:53.197360	Tx RANCAGUA On	
15072028	Jan 07 2016 01:27:53.197360	reset led On	
15072027	Jan 07 2016 01:27:53.197360	pkp Z1o z2 On	
15072026	Jan 07 2016 01:27:53.197360	HYBRID POTT TX1	
15072025	Jan 07 2016 01:27:53.197360	GND DIST Z3 PKP A	
15072024	Jan 07 2016 01:27:53.197360	GND DIST Z2 PKP A	
15072023	Jan 07 2016 01:27:53.189866	NEG SEQ DIR OC1 FWD	
15072022	Jan 07 2016 01:27:53.183474	52A2 (a) On	
15072021	Jan 07 2016 01:27:15.221492	URT REC ACEL Off	
15072020	Jan 07 2016 01:27:15.221492	ECHO COND 2T Off	
15072019	Jan 07 2016 01:27:15.221492	RECEPCION Off	
15072018	Jan 07 2016 01:27:15.221492	RECEPCION 2T Off	
15072017	Jan 07 2016 01:27:15.221492	RECEP ACELER Off	
15072016	Jan 07 2016 01:27:15.219179	Rx RANCAGUA Off	

Event Number	Date/Time	Cause	Data
15072077	Jan 07 2016 01:34:06.440579	RESET OP(PUSHBUTTON)	
15072076	Jan 07 2016 01:27:53.337343	URT REC ACEL Off	
15072075	Jan 07 2016 01:27:53.337343	ECHO COND 2T Off	
15072074	Jan 07 2016 01:27:53.337343	RECEPCION Off	
15072073	Jan 07 2016 01:27:53.337343	RECEPCION 2T Off	
15072072	Jan 07 2016 01:27:53.337343	RECEP ACELER Off	
15072071	Jan 07 2016 01:27:53.332999	Rx RANCAGUA Off	
15072070	Jan 07 2016 01:27:53.259866	reset led Off	
15072069	Jan 07 2016 01:27:53.259866	NEUTRAL TOC1 DPO	
15072068	Jan 07 2016 01:27:53.254865	RETRIP 50BF Off	
15072067	Jan 07 2016 01:27:53.249863	URT TRIP S1 Off	
15072066	Jan 07 2016 01:27:53.249863	PARA PRUEBAS Off	
15072065	Jan 07 2016 01:27:53.249863	TRIP BD1 Off	
15072064	Jan 07 2016 01:27:53.249863	OSCILOGRAFIA Off	
15072063	Jan 07 2016 01:27:53.249863	TRIP GRAL Off	
15072062	Jan 07 2016 01:27:53.249863	PHASE TOC1 DPO A	
15072061	Jan 07 2016 01:27:53.247363	Tx RANCAGUA Off	
15072060	Jan 07 2016 01:27:53.247363	POTT OP 2T Off	
15072059	Jan 07 2016 01:27:53.247363	Tx RANCAGUA Off	
15072058	Jan 07 2016 01:27:53.247363	pkp Z1o z2 Off	

Figura 18: Registro de eventos

Siemens 7SA612, paño A2, S/E Alto Jahuel – Sistema 2.



Event Log - 07-01-2016 9:27:21.328 - Fallas / L154kVTing-Ran-Aja070115 / Alto Jahuel / 52A2_C2 / 7SA612 V4.6 Var 1-

Number	Indication	Value	Date and time	Initiator	Cause	St
04010	>85-21 Carrier RECEPTION, Channel 2	ON	07.01.2016 01:07:26.206	Com.Issued=Aut...	Spontaneous	
04246	ECHO Send SIGNAL	ON	07.01.2016 01:07:26.248	Com.Issued=Aut...	Spontaneous	
04010	>85-21 Carrier RECEPTION, Channel 2	OFF	07.01.2016 01:07:26.334	Com.Issued=Aut...	Spontaneous	
00301	Power System fault	1468 - ON	07.01.2016 01:07:26.576	Com.Issued=Aut...	Spontaneous	
04056	85-21 Carrier SEND signal	ON	07.01.2016 01:07:26.576	Com.Issued=Aut...	Spontaneous	
04006	>85-21 Carrier RECEPTION, Channel 1	ON	07.01.2016 01:07:26.589	Com.Issued=Aut...	Spontaneous	
04010	>85-21 Carrier RECEPTION, Channel 2	ON	07.01.2016 01:07:26.616	Com.Issued=Aut...	Spontaneous	
00301	Power System fault	1468 - OFF	07.01.2016 01:07:26.731	Com.Issued=Aut...	Spontaneous	
04006	>85-21 Carrier RECEPTION, Channel 1	OFF	07.01.2016 01:07:26.740	Com.Issued=Aut...	Spontaneous	
04010	>85-21 Carrier RECEPTION, Channel 2	OFF	07.01.2016 01:07:26.816	Com.Issued=Aut...	Spontaneous	
	52A3PtaC	ON	07.01.2016 01:13:00.517	Com.Issued=Aut...	Spontaneous	
	Setting Group A is active	OFF	07.01.2016 01:13:03.772	Com.Issued=Aut...	Control Issued	
	Setting Group B is active	ON	07.01.2016 01:13:03.786	Com.Issued=Aut...	Control Issued	
00060	Reset LED	ON	07.01.2016 01:24:39.039	Com.Issued=Aut...	Spontaneous	
00590	Line closure detected	ON	07.01.2016 01:27:15.074	Com.Issued=Aut...	Spontaneous	
00301	Power System fault	1469 - ON	07.01.2016 01:27:15.075	Com.Issued=Aut...	Spontaneous	
04056	85-21 Carrier SEND signal	ON	07.01.2016 01:27:15.076	Com.Issued=Aut...	Spontaneous	
00060	Reset LED	ON	07.01.2016 01:27:15.089	Com.Issued=Aut...	Spontaneous	
04006	>85-21 Carrier RECEPTION, Channel 1	ON	07.01.2016 01:27:15.118	Com.Issued=Aut...	Spontaneous	
00590	Line closure detected	OFF	07.01.2016 01:27:15.137	Com.Issued=Aut...	Spontaneous	
04010	>85-21 Carrier RECEPTION, Channel 2	ON	07.01.2016 01:27:15.142	Com.Issued=Aut...	Spontaneous	
00301	Power System fault	1469 - OFF	07.01.2016 01:27:15.210	Com.Issued=Aut...	Spontaneous	
04006	>85-21 Carrier RECEPTION, Channel 1	OFF	07.01.2016 01:27:15.220	Com.Issued=Aut...	Spontaneous	
04010	>85-21 Carrier RECEPTION, Channel 2	OFF	07.01.2016 01:27:15.344	Com.Issued=Aut...	Spontaneous	
00060	Reset LED	ON	07.01.2016 01:27:53.182	Com.Issued=Aut...	Spontaneous	
00590	Line closure detected	ON	07.01.2016 01:27:53.186	Com.Issued=Aut...	Spontaneous	
00301	Power System fault	1470 - ON	07.01.2016 01:27:53.186	Com.Issued=Aut...	Spontaneous	
04056	85-21 Carrier SEND signal	ON	07.01.2016 01:27:53.190	Com.Issued=Aut...	Spontaneous	
04006	>85-21 Carrier RECEPTION, Channel 1	ON	07.01.2016 01:27:53.233	Com.Issued=Aut...	Spontaneous	
00590	Line closure detected	OFF	07.01.2016 01:27:53.243	Com.Issued=Aut...	Spontaneous	
00591	Single pole open detected in Phase A	ON	07.01.2016 01:27:53.248	Com.Issued=Aut...	Spontaneous	
01332	50N / 51N Ground O/C is BLOCKED	ON	07.01.2016 01:27:53.248	Com.Issued=Aut...	Spontaneous	
04010	>85-21 Carrier RECEPTION, Channel 2	ON	07.01.2016 01:27:53.255	Com.Issued=Aut...	Spontaneous	
00301	Power System fault	1470 - OFF	07.01.2016 01:27:53.289	Com.Issued=Aut...	Spontaneous	
04006	>85-21 Carrier RECEPTION, Channel 1	OFF	07.01.2016 01:27:53.334	Com.Issued=Aut...	Spontaneous	
04010	>85-21 Carrier RECEPTION, Channel 2	OFF	07.01.2016 01:27:53.455	Com.Issued=Aut...	Spontaneous	
00591	Single pole open detected in Phase A	OFF	07.01.2016 01:27:53.552	Com.Issued=Aut...	Spontaneous	
01332	50N / 51N Ground O/C is BLOCKED	OFF	07.01.2016 01:27:53.592	Com.Issued=Aut...	Spontaneous	

Trip Log - 001468 / 07-01-2016 1:07:26.576 - Fallas / L154kVTing-Ran-Aja070115 / Alto Jahuel / 52...

Number	Indication	Value	Date and time
00301	Power System fault	1468 - ON	07.01.2016 01:07:26.576
00302	Fault Event	1475 - ON	07.01.2016 01:07:26.576
03682	21 Pickup AG	ON	0 ms
03701	21 Selected Loop AG forward	ON	0 ms
04056	85-21 Carrier SEND signal	ON	0 ms
01358	67N picked up FORWARD	ON	10 ms
01357	51N PICKED UP	ON	10 ms
04006	>85-21 Carrier RECEPTION, Channel 1	ON	13 ms
04010	>85-21 Carrier RECEPTION, Channel 2	ON	40 ms
03805	21 TRIP command Phases ABC	ON	40 ms
00533	Primary fault current Ia	1,93 kA	42 ms
00534	Primary fault current Ib	0,54 kA	42 ms
00535	Primary fault current Ic	0,38 kA	42 ms
01461	50BF Breaker failure protection started	ON	43 ms
01476	50BF Local trip - ABC	ON	53 ms
01461	50BF Breaker failure protection started	OFF	98 ms
03671	21 PICKED UP	OFF	108 ms
03701	21 Selected Loop AG forward	OFF	108 ms
01345	50N / 51N PICKED UP	OFF	123 ms
01123	Fault Locator Loop AG	ON	68 ms
01117	Flt Locator: secondary RESISTANCE	0,49 Ohm	68 ms
01118	Flt Locator: secondary REACTANCE	1,53 Ohm	68 ms
01114	Flt Locator: primary RESISTANCE	5,76 Ohm	68 ms
01115	Flt Locator: primary REACTANCE	17,83 Ohm	68 ms
01119	Flt Locator: Distance to fault	43,4 km	68 ms
01120	Flt Locator: Distance [%] to fault	85,8 %	68 ms

Trip Log - 001469 / 07-01-2016 1:27:15.075 - Fallas / L154kVTing-Ran-Aja070115 / Alto Jahuel / 52...

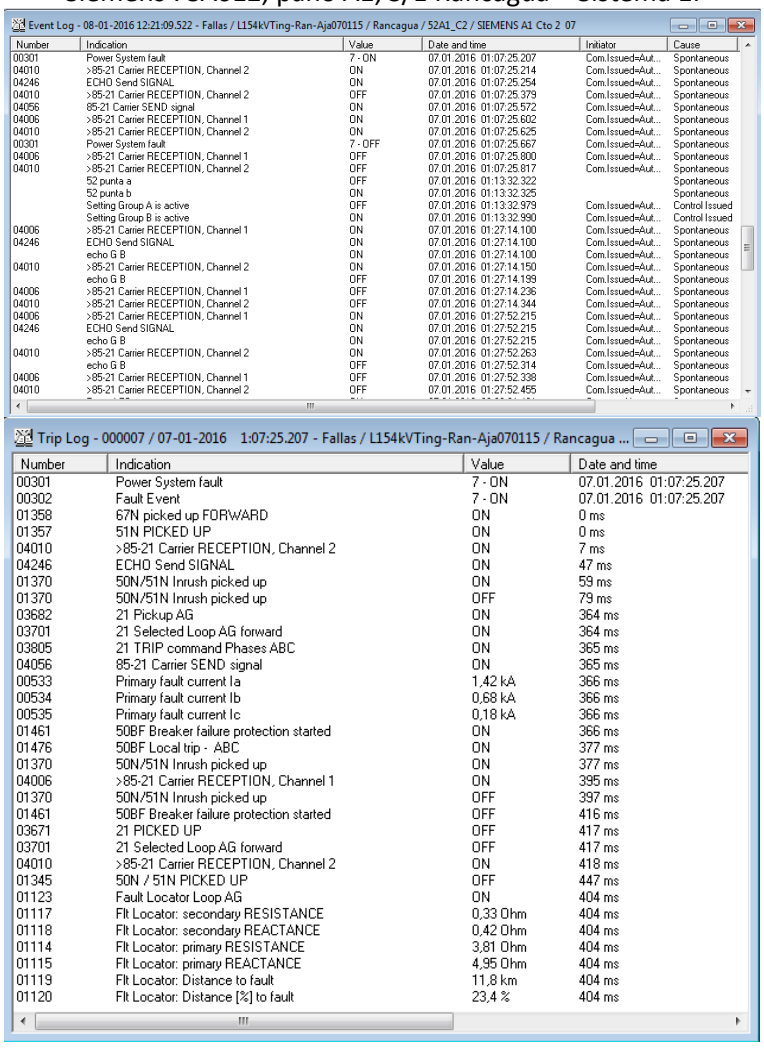
Number	Indication	Value	Date and time
00301	Power System fault	1469 - ON	07.01.2016 01:27:15.075
00302	Fault Event	1476 - ON	07.01.2016 01:27:15.075
03682	21 Pickup AG	ON	0 ms
03701	21 Selected Loop AG forward	ON	0 ms
04056	85-21 Carrier SEND signal	ON	1 ms
03805	21 TRIP command Phases ABC	ON	1 ms
00533	Primary fault current Ia	2,00 kA	2 ms
00534	Primary fault current Ib	0,02 kA	2 ms
00535	Primary fault current Ic	0,02 kA	2 ms
01461	50BF Breaker failure protection started	ON	2 ms
04282	50HS Pickup Phase A	ON	4 ms
04295	50HS SOTF-O/C TRIP command Phases ABC	ON	4 ms
01358	67N picked up FORWARD	ON	13 ms
01354	50N-1 PICKED UP	ON	13 ms
01357	51N PICKED UP	ON	13 ms
01476	50BF Local trip - ABC	ON	22 ms
04006	>85-21 Carrier RECEPTION, Channel 1	ON	43 ms
01365	50N / 51N: Trip 3pole	ON	44 ms
01366	50N-1 TRIP	ON	44 ms
00590	Line closure detected	OFF	62 ms
01461	50BF Breaker failure protection started	OFF	62 ms
03671	21 PICKED UP	OFF	63 ms
03701	21 Selected Loop AG forward	OFF	63 ms
04010	>85-21 Carrier RECEPTION, Channel 2	ON	67 ms
01345	50N / 51N PICKED UP	OFF	83 ms
04281	50HS PICKED UP	OFF	92 ms
01123	Fault Locator Loop AG	ON	53 ms
01117	Flt Locator: secondary RESISTANCE	0,49 Ohm	53 ms
01118	Flt Locator: secondary REACTANCE	1,78 Ohm	53 ms
01114	Flt Locator: primary RESISTANCE	5,73 Ohm	53 ms
01115	Flt Locator: primary REACTANCE	20,74 Ohm	53 ms
01119	Flt Locator: Distance to fault	50,5 km	53 ms
01120	Flt Locator: Distance [%] to fault	83,3 %	53 ms

Trip Log - 001470 / 07-01-2016 1:27:53.186 - Fallas / L154kVTing-Ran-Aja070115 / Alto Jahuel / 52...

Number	Indication	Value	Date and time
00301	Power System fault	1470 - ON	07.01.2016 01:27:53.186
00302	Fault Event	1477 - ON	07.01.2016 01:27:53.186
04282	50HS Pickup Phase A	ON	0 ms
04295	50HS SOTF-O/C TRIP command Phases ABC	ON	0 ms
00533	Primary fault current Ia	1,65 kA	2 ms
00534	Primary fault current Ib	0,02 kA	2 ms
00535	Primary fault current Ic	0,02 kA	2 ms
01461	50BF Breaker failure protection started	ON	3 ms
03682	21 Pickup AG	ON	4 ms
03701	21 Selected Loop AG forward	ON	4 ms
04056	85-21 Carrier SEND signal	ON	4 ms
03805	21 TRIP command Phases ABC	ON	4 ms
01370	50N/51N Inrush picked up	ON	13 ms
01358	67N picked up FORWARD	ON	14 ms
01354	50N-1 PICKED UP	ON	14 ms
01357	51N PICKED UP	ON	14 ms
01476	50BF Local trip - ABC	ON	22 ms
01370	50N/51N Inrush picked up	OFF	23 ms
01365	50N / 51N: Trip 3pole	ON	43 ms
01366	50N-1 TRIP	ON	43 ms
04006	>85-21 Carrier RECEPTION, Channel 1	ON	47 ms
00590	Line closure detected	OFF	57 ms
01461	50BF Breaker failure protection started	OFF	57 ms
03671	21 PICKED UP	OFF	58 ms
03701	21 Selected Loop AG forward	OFF	58 ms
00591	Single pole open detected in Phase A	ON	62 ms
01332	50N / 51N Ground O/C is BLOCKED	ON	62 ms
01345	50N / 51N PICKED UP	OFF	63 ms
04010	>85-21 Carrier RECEPTION, Channel 2	ON	69 ms
04281	50HS PICKED UP	OFF	82 ms
01123	Fault Locator Loop AG	ON	43 ms
01117	Flt Locator: secondary RESISTANCE	0,50 Ohm	43 ms
01118	Flt Locator: secondary REACTANCE	1,76 Ohm	43 ms
01114	Flt Locator: primary RESISTANCE	5,87 Ohm	43 ms
01115	Flt Locator: primary REACTANCE	20,55 Ohm	43 ms
01119	Flt Locator: Distance to fault	50,0 km	43 ms
01120	Flt Locator: Distance [%] to fault	82,6 %	43 ms

Figura 15: Registro de eventos

Siemens 7SA612, paño A1, S/E Rancagua – Sistema 1.



Event Log - 08-01-2016 12:21:09.522 - Fallas / L154kVTing-Ran-Aja070115 / Rancagua / 52A1_C2 / SIEMENS A1 Cto 2 07

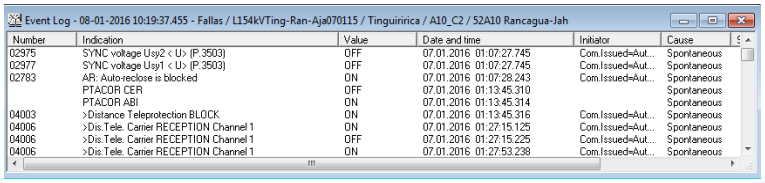
Number	Indication	Value	Date and time	Initiator	Cause
00301	Power System fault	7 - ON	07.01.2016 01:07:25.207	Com.Issued=Aut...	Spontaneous
04010	>85-21 Carrier RECEPTION, Channel 2	ON	07.01.2016 01:07:25.214	Com.Issued=Aut...	Spontaneous
04246	ECHO Send SIGNAL	ON	07.01.2016 01:07:25.254	Com.Issued=Aut...	Spontaneous
04010	>85-21 Carrier RECEPTION, Channel 2	OFF	07.01.2016 01:07:25.379	Com.Issued=Aut...	Spontaneous
04056	85-21 Carrier SEND signal	ON	07.01.2016 01:07:25.572	Com.Issued=Aut...	Spontaneous
04006	>85-21 Carrier RECEPTION, Channel 1	ON	07.01.2016 01:07:25.602	Com.Issued=Aut...	Spontaneous
04010	>85-21 Carrier RECEPTION, Channel 2	ON	07.01.2016 01:07:25.625	Com.Issued=Aut...	Spontaneous
00301	Power System fault	7 - OFF	07.01.2016 01:07:25.667	Com.Issued=Aut...	Spontaneous
04006	>85-21 Carrier RECEPTION, Channel 1	OFF	07.01.2016 01:07:25.800	Com.Issued=Aut...	Spontaneous
04010	>85-21 Carrier RECEPTION, Channel 2	OFF	07.01.2016 01:07:25.817	Com.Issued=Aut...	Spontaneous
	52 punta a	OFF	07.01.2016 01:13:32.322		Spontaneous
	52 punta b	ON	07.01.2016 01:13:32.325		Spontaneous
	Setting Group A is active	OFF	07.01.2016 01:13:32.979	Com.Issued=Aut...	Control Issued
	Setting Group B is active	ON	07.01.2016 01:13:32.990	Com.Issued=Aut...	Control Issued
04006	>85-21 Carrier RECEPTION, Channel 1	ON	07.01.2016 01:27:14.100	Com.Issued=Aut...	Spontaneous
04246	ECHO Send SIGNAL	ON	07.01.2016 01:27:14.100	Com.Issued=Aut...	Spontaneous
	echo G B	ON	07.01.2016 01:27:14.100	Com.Issued=Aut...	Spontaneous
04010	>85-21 Carrier RECEPTION, Channel 2	ON	07.01.2016 01:27:14.150	Com.Issued=Aut...	Spontaneous
	echo G B	OFF	07.01.2016 01:27:14.199	Com.Issued=Aut...	Spontaneous
04006	>85-21 Carrier RECEPTION, Channel 1	OFF	07.01.2016 01:27:14.236	Com.Issued=Aut...	Spontaneous
04010	>85-21 Carrier RECEPTION, Channel 2	OFF	07.01.2016 01:27:14.344	Com.Issued=Aut...	Spontaneous
04006	>85-21 Carrier RECEPTION, Channel 1	ON	07.01.2016 01:27:52.215	Com.Issued=Aut...	Spontaneous
04246	ECHO Send SIGNAL	ON	07.01.2016 01:27:52.215	Com.Issued=Aut...	Spontaneous
	echo G B	ON	07.01.2016 01:27:52.215	Com.Issued=Aut...	Spontaneous
04010	>85-21 Carrier RECEPTION, Channel 2	ON	07.01.2016 01:27:52.263	Com.Issued=Aut...	Spontaneous
	echo G B	OFF	07.01.2016 01:27:52.314	Com.Issued=Aut...	Spontaneous
04006	>85-21 Carrier RECEPTION, Channel 1	OFF	07.01.2016 01:27:52.338	Com.Issued=Aut...	Spontaneous
04010	>85-21 Carrier RECEPTION, Channel 2	OFF	07.01.2016 01:27:52.455	Com.Issued=Aut...	Spontaneous

Trip Log - 000007 / 07-01-2016 1:07:25.207 - Fallas / L154kVTing-Ran-Aja070115 / Rancagua ...

Number	Indication	Value	Date and time
00301	Power System fault	7 - ON	07.01.2016 01:07:25.207
00302	Fault Event	7 - ON	07.01.2016 01:07:25.207
01358	67N picked up FORWARD	ON	0 ms
01357	51N PICKED UP	ON	0 ms
04010	>85-21 Carrier RECEPTION, Channel 2	ON	7 ms
04246	ECHO Send SIGNAL	ON	47 ms
01370	50N/51N Inrush picked up	ON	59 ms
01370	50N/51N Inrush picked up	OFF	79 ms
03682	21 Pickup AG	ON	364 ms
03701	21 Selected Loop AG forward	ON	364 ms
03805	21 TRIP command Phases ABC	ON	365 ms
04056	85-21 Carrier SEND signal	ON	365 ms
00533	Primary fault current Ia	1,42 kA	366 ms
00534	Primary fault current Ib	0,68 kA	366 ms
00535	Primary fault current Ic	0,18 kA	366 ms
01461	50BF Breaker failure protection started	ON	366 ms
01476	50BF Local trip - ABC	ON	377 ms
01370	50N/51N Inrush picked up	ON	377 ms
04006	>85-21 Carrier RECEPTION, Channel 1	ON	395 ms
01370	50N/51N Inrush picked up	OFF	397 ms
01461	50BF Breaker failure protection started	OFF	416 ms
03671	21 PICKED UP	OFF	417 ms
03701	21 Selected Loop AG forward	OFF	417 ms
04010	>85-21 Carrier RECEPTION, Channel 2	ON	418 ms
01345	50N / 51N PICKED UP	OFF	447 ms
01123	Fault Locator Loop AG	ON	404 ms
01117	Flt Locator: secondary RESISTANCE	0,33 Ohm	404 ms
01118	Flt Locator: secondary REACTANCE	0,42 Ohm	404 ms
01114	Flt Locator: primary RESISTANCE	3,81 Ohm	404 ms
01115	Flt Locator: primary REACTANCE	4,95 Ohm	404 ms
01119	Flt Locator: Distance to fault	11,8 km	404 ms
01120	Flt Locator: Distance [%] to fault	23,4 %	404 ms

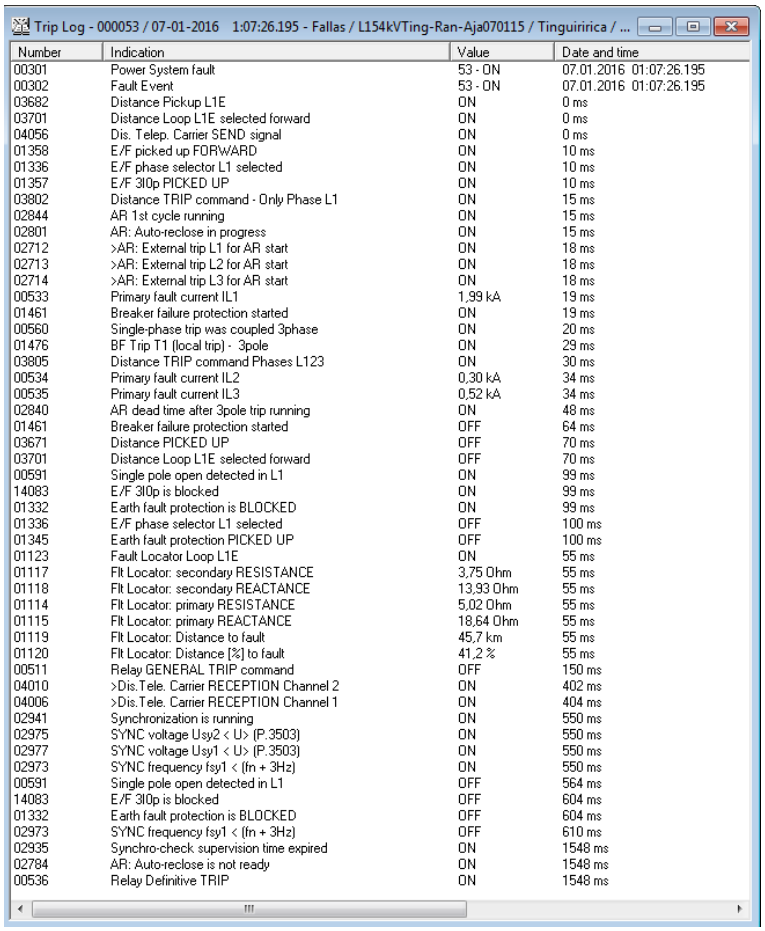
Figura 20: Registro de eventos

Siemens 7SA612, paño A10, S/E Tinguiririca – Sistema 1.



Event Log - 08-01-2016 10:19:37.455 - Fallas / L154kVTing-Ran-Aja070115 / Tinguiririca / A10_C2 / 52A10 Rancagua-Jah

Number	Indication	Value	Date and time	Initiator	Cause	S
02975	SYNC voltage Usy2 < U> (P.3503)	OFF	07.01.2016 01:07:27.745	Com.Issued=Aut...	Spontaneous	
02977	SYNC voltage Usy1 < U> (P.3503)	OFF	07.01.2016 01:07:27.745	Com.Issued=Aut...	Spontaneous	
02783	AR: Auto-reclose is blocked	ON	07.01.2016 01:07:28.243	Com.Issued=Aut...	Spontaneous	
	PTACOR CER	OFF	07.01.2016 01:13:45.310		Spontaneous	
	PTACOR ABI	ON	07.01.2016 01:13:45.314		Spontaneous	
04003	>Distance Teleprotection BLOCK	ON	07.01.2016 01:13:45.316	Com.Issued=Aut...	Spontaneous	
04006	>Dis.Tele. Carrier RECEPTION Channel 1	ON	07.01.2016 01:27:15.125	Com.Issued=Aut...	Spontaneous	
04006	>Dis.Tele. Carrier RECEPTION Channel 1	OFF	07.01.2016 01:27:15.225	Com.Issued=Aut...	Spontaneous	
04006	>Dis.Tele. Carrier RECEPTION Channel 1	ON	07.01.2016 01:27:53.238	Com.Issued=Aut...	Spontaneous	



Trip Log - 000053 / 07-01-2016 1:07:26.195 - Fallas / L154kVTing-Ran-Aja070115 / Tinguiririca / ...

Number	Indication	Value	Date and time
00301	Power System fault	53 - ON	07.01.2016 01:07:26.195
00302	Fault Event	53 - ON	07.01.2016 01:07:26.195
03682	Distance Pickup L1E	ON	0 ms
03701	Distance Loop L1E selected forward	ON	0 ms
04056	Dis. Telep. Carrier SEND signal	ON	0 ms
01358	E/F picked up FORWARD	ON	10 ms
01336	E/F phase selector L1 selected	ON	10 ms
01357	E/F 3I0p PICKED UP	ON	10 ms
03802	Distance TRIP command - Only Phase L1	ON	15 ms
02844	AR 1st cycle running	ON	15 ms
02801	AR: Auto-reclose in progress	ON	15 ms
02712	>AR: External trip L1 for AR start	ON	18 ms
02713	>AR: External trip L2 for AR start	ON	18 ms
02714	>AR: External trip L3 for AR start	ON	18 ms
00533	Primary fault current IL1	1,99 kA	19 ms
01461	Breaker failure protection started	ON	19 ms
00560	Single-phase trip was coupled 3phase	ON	20 ms
01476	BF Trip T1 (local trip) - 3pole	ON	29 ms
03805	Distance TRIP command Phases L123	ON	30 ms
00534	Primary fault current IL2	0,30 kA	34 ms
00535	Primary fault current IL3	0,52 kA	34 ms
02840	AR dead time after 3pole trip running	ON	48 ms
01461	Breaker failure protection started	OFF	64 ms
03671	Distance PICKED UP	OFF	70 ms
03701	Distance Loop L1E selected forward	OFF	70 ms
00591	Single pole open detected in L1	ON	99 ms
14083	E/F 3I0p is blocked	ON	99 ms
01332	Earth fault protection is BLOCKED	ON	99 ms
01336	E/F phase selector L1 selected	OFF	100 ms
01345	Earth fault protection PICKED UP	OFF	100 ms
01123	Fault Locator Loop L1E	ON	55 ms
01117	Flt Locator: secondary RESISTANCE	3,75 Ohm	55 ms
01118	Flt Locator: secondary REACTANCE	13,93 Ohm	55 ms
01114	Flt Locator: primary RESISTANCE	5,02 Ohm	55 ms
01115	Flt Locator: primary REACTANCE	18,64 Ohm	55 ms
01119	Flt Locator: Distance to fault	45,7 km	55 ms
01120	Flt Locator: Distance [%] to fault	41,2 %	55 ms
00511	Relay GENERAL TRIP command	OFF	150 ms
04010	>Dis.Tele. Carrier RECEPTION Channel 2	ON	402 ms
04006	>Dis.Tele. Carrier RECEPTION Channel 1	ON	404 ms
02941	Synchronization is running	ON	550 ms
02975	SYNC voltage Usy2 < U> (P.3503)	ON	550 ms
02977	SYNC voltage Usy1 < U> (P.3503)	ON	550 ms
02973	SYNC frequency fsy1 < (fn + 3Hz)	ON	550 ms
00591	Single pole open detected in L1	OFF	564 ms
14083	E/F 3I0p is blocked	OFF	604 ms
01332	Earth fault protection is BLOCKED	OFF	604 ms
02973	SYNC frequency fsy1 < (fn + 3Hz)	OFF	610 ms
02935	Synchro-check supervision time expired	ON	1548 ms
02784	AR: Auto-reclose is not ready	ON	1548 ms
00536	Relay Definitive TRIP	ON	1548 ms

Figura 21: Registro de eventos

GE D60, paño A10, S/E Tinguiririca – Sistema 2.

Event Number	Date/Time	Cause	Data
527651	Jan 07 2016 01:07:26.210187	PH DIST Z5 PKP AB	
527650	Jan 07 2016 01:07:26.210187	PH DIST Z2 PKP AB	
527649	Jan 07 2016 01:07:26.202693	RETRIP C On	
527648	Jan 07 2016 01:07:26.202693	RETRIP B On	
527647	Jan 07 2016 01:07:26.202693	RETRIP A On	
527646	Jan 07 2016 01:07:26.202693	Osc Trigger Off	
527645	Jan 07 2016 01:07:26.202693	FAULT RPT TRIG	
527644	Jan 07 2016 01:07:26.200196	TRIP POLO C On	
527643	Jan 07 2016 01:07:26.200196	TRIP POLO B On	
527642	Jan 07 2016 01:07:26.200196	TRIP POLO A On	
527641	Jan 07 2016 01:07:26.200196	TRIP POLO C On	
527640	Jan 07 2016 01:07:26.200196	TRIP POLO B On	
527639	Jan 07 2016 01:07:26.200196	TRIP POLO A On	
527638	Jan 07 2016 01:07:26.200196	TRIP SCADA On	
527637	Jan 07 2016 01:07:26.200196	OSCILLOGRAPHY TRIG'D	
527636	Jan 07 2016 01:07:26.200196	Osc Trigger On	
527635	Jan 07 2016 01:07:26.200196	AR 3P START On	
527634	Jan 07 2016 01:07:26.200196	Start 50BF On	
527633	Jan 07 2016 01:07:26.200196	GND DIST Z1 OP A	
527632	Jan 07 2016 01:07:26.200196	GND DIST Z1 PKP A	
527631	Jan 07 2016 01:07:26.195200	PKP Z3 EDAG On	
527630	Jan 07 2016 01:07:26.195200	PKP Z3 On	
527629	Jan 07 2016 01:07:26.195200	GND DIST Z3 PKP A	
527628	Jan 07 2016 01:07:26.195200	PH DIST Z3 PKP CA	
527627	Jan 07 2016 01:07:26.190208	PH DIST Z5 PKP CA	
527626	Jan 07 2016 01:07:26.190208	PH DIST Z2 PKP CA	
527625	Jan 07 2016 01:07:26.187709	POWER SWING OUTER	
527624	Jan 07 2016 01:07:26.187709	POWER SWING INNER	
527623	Jan 07 2016 01:07:26.185209	TX. 85A2 On	
527622	Jan 07 2016 01:07:26.185209	TX 85A1 On	
527621	Jan 07 2016 01:07:26.185209	Emision 85A On	
527620	Jan 07 2016 01:07:26.185209	HYBRID POTT TX1	
527619	Jan 07 2016 01:07:26.185209	GND DIST Z5 PKP A	
527618	Jan 07 2016 01:07:26.185209	GND DIST Z2 PKP A	
527617	Jan 07 2016 01:07:26.185209	NEG SEQ DIR OC1 FWD	
527616	Jan 07 2016 01:07:26.182711	POWER SWING MIDDLE	
527615	Jan 07 2016 01:07:25.698201	NEUTRAL TOC2 PKP	

Event Number	Date/Time	Cause	Data
527688	Jan 07 2016 01:07:26.592477	ECHO TX On	
527687	Jan 07 2016 01:07:26.592477	RX. 85A On	
527686	Jan 07 2016 01:07:26.337626	SYNC 1 CLS OP	
527685	Jan 07 2016 01:07:26.337626	SYNC 1 SYNC OP	
527684	Jan 07 2016 01:07:26.312627	TX. 85A2 Off	
527683	Jan 07 2016 01:07:26.312627	TX 85A1 Off	
527682	Jan 07 2016 01:07:26.312627	Emision 85A Off	
527681	Jan 07 2016 01:07:26.280130	TRIP POLO A Off	
527680	Jan 07 2016 01:07:26.280130	TRIP POLO A Off	
527679	Jan 07 2016 01:07:26.280130	TRIP SCADA Off	
527678	Jan 07 2016 01:07:26.280130	Start 50BF Off	
527677	Jan 07 2016 01:07:26.277634	TRIP POLO C Off	
527676	Jan 07 2016 01:07:26.277634	TRIP POLO C Off	
527675	Jan 07 2016 01:07:26.277634	NEUTRAL TOC2 DPO	
527674	Jan 07 2016 01:07:26.270140	TRIP POLO B Off	
527673	Jan 07 2016 01:07:26.270140	TRIP POLO B Off	
527672	Jan 07 2016 01:07:26.257652	RETRIP C Off	
527671	Jan 07 2016 01:07:26.257652	RETRIP B Off	
527670	Jan 07 2016 01:07:26.257652	RETRIP A Off	
527669	Jan 07 2016 01:07:26.237665	SYNC 1 CLS DPO	
527668	Jan 07 2016 01:07:26.237665	SYNC 1 SYNC DPO	
527667	Jan 07 2016 01:07:26.212683	PKP Z3 EDAG Off	
527666	Jan 07 2016 01:07:26.212683	PKP Z3 Off	
527665	Jan 07 2016 01:07:26.212683	AR 3P START Off	
527664	Jan 07 2016 01:07:26.212683	GND DIST Z5 DPO A	
527663	Jan 07 2016 01:07:26.212683	GND DIST Z3 DPO A	
527662	Jan 07 2016 01:07:26.212683	GND DIST Z2 DPO A	
527661	Jan 07 2016 01:07:26.212683	GND DIST Z1 DPO A	
527660	Jan 07 2016 01:07:26.212683	PH DIST Z5 DPO CA	
527659	Jan 07 2016 01:07:26.212683	PH DIST Z5 DPO AB	
527658	Jan 07 2016 01:07:26.212683	PH DIST Z3 DPO CA	
527657	Jan 07 2016 01:07:26.212683	PH DIST Z2 DPO CA	
527656	Jan 07 2016 01:07:26.212683	PH DIST Z2 DPO AB	
527655	Jan 07 2016 01:07:26.210187	Open 3p On	
527654	Jan 07 2016 01:07:26.210187	OPEN POLE OP C	
527653	Jan 07 2016 01:07:26.210187	OPEN POLE OP B	
527652	Jan 07 2016 01:07:26.210187	OPEN POLE OP A	
527651	Jan 07 2016 01:07:26.210187	PH DIST Z5 PKP AB	

Event Number	Date/Time	Cause	Data
527723	Jan 07 2016 01:27:53.436784	TX. 85A2 Off	
527722	Jan 07 2016 01:27:53.436784	TX 85A1 Off	
527721	Jan 07 2016 01:27:53.436784	Emision 85A Off	
527720	Jan 07 2016 01:27:53.336833	ECHO TX Off	
527719	Jan 07 2016 01:27:53.336833	RX. 85A Off	
527718	Jan 07 2016 01:27:53.236837	TX. 85A2 On	
527717	Jan 07 2016 01:27:53.236837	TX 85A1 On	
527716	Jan 07 2016 01:27:53.236837	Emision 85A On	
527715	Jan 07 2016 01:27:53.236837	HYBRID POTT TX1	
527714	Jan 07 2016 01:27:53.234336	ECHO TX On	
527713	Jan 07 2016 01:27:53.234336	RX. 85A On	
527712	Jan 07 2016 01:27:15.322040	TX. 85A2 Off	
527711	Jan 07 2016 01:27:15.322040	TX 85A1 Off	
527710	Jan 07 2016 01:27:15.322040	Emision 85A Off	
527709	Jan 07 2016 01:27:15.221990	ECHO TX Off	
527708	Jan 07 2016 01:27:15.221990	RX. 85A Off	
527707	Jan 07 2016 01:27:15.121941	TX. 85A2 On	
527706	Jan 07 2016 01:27:15.121941	TX 85A1 On	
527705	Jan 07 2016 01:27:15.121941	Emision 85A On	
527704	Jan 07 2016 01:27:15.121941	HYBRID POTT TX1	
527703	Jan 07 2016 01:27:15.119439	ECHO TX On	
527702	Jan 07 2016 01:27:15.119439	RX. 85A On	
527701	Jan 07 2016 01:13:45.307386	BLOCK HYBRID On	
527700	Jan 07 2016 01:07:26.794728	TX. 85A2 Off	
527699	Jan 07 2016 01:07:26.794728	TX 85A1 Off	
527698	Jan 07 2016 01:07:26.794728	Emision 85A Off	
527697	Jan 07 2016 01:07:26.749791	SRC1 VT FF VOL LOSS	
527696	Jan 07 2016 01:07:26.712344	ECHO TX Off	
527695	Jan 07 2016 01:07:26.712344	RX. 85A Off	
527694	Jan 07 2016 01:07:26.677398	SYNC 1 CLS DPO	
527693	Jan 07 2016 01:07:26.677398	SYNC 1 SYNC DPO	
527692	Jan 07 2016 01:07:26.594975	TX. 85A2 On	
527691	Jan 07 2016 01:07:26.594975	TX 85A1 On	
527690	Jan 07 2016 01:07:26.594975	Emision 85A On	
527689	Jan 07 2016 01:07:26.594975	HYBRID POTT TX1	
527688	Jan 07 2016 01:07:26.592477	ECHO TX On	
527687	Jan 07 2016 01:07:26.592477	RX. 85A On	

Figura 22: Registro de eventos

GE D60, paño A1, S/E Alto Jahuel – Sistema 1.

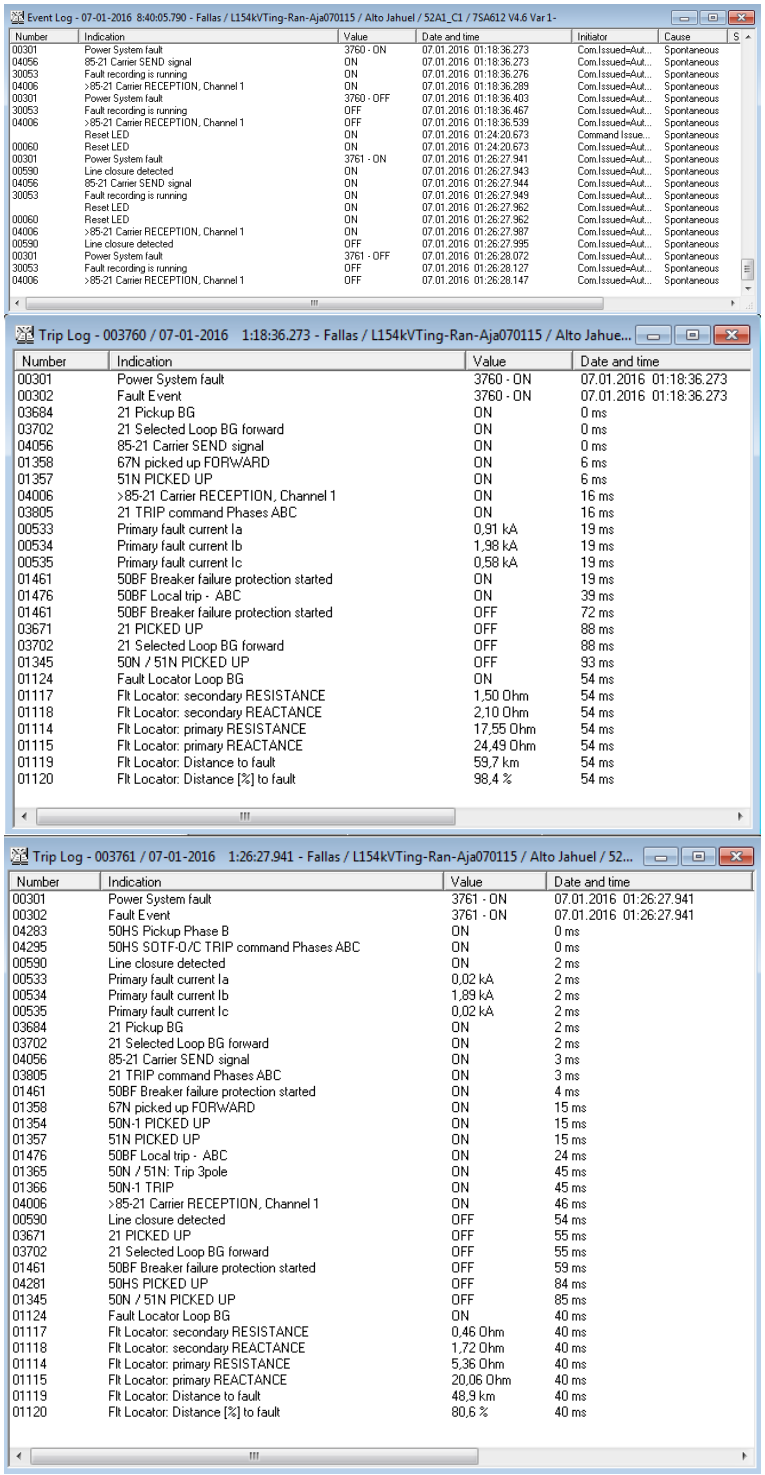
Event Number	Date/Time	Cause	Data
5185204	Jan 07 2016 01:18:36.341371	PH DIST Z3 DPO AB	
5185203	Jan 07 2016 01:18:36.338872	PHASE TOC1 DPO A	
5185202	Jan 07 2016 01:18:36.331372	PH DIST Z2 DPO AB	
5185201	Jan 07 2016 01:18:36.303875	TX RANCAGUA Off	
5185200	Jan 07 2016 01:18:36.303875	Tx RANCAGUA Off	
5185199	Jan 07 2016 01:18:36.303875	TX MMOO Off	
5185198	Jan 07 2016 01:18:36.293876	URT TRIP S1 On	
5185197	Jan 07 2016 01:18:36.293876	PRUEBA D60 On	
5185196	Jan 07 2016 01:18:36.293876	TRIP BD1 On	
5185195	Jan 07 2016 01:18:36.293876	OSCILLOGRAPHY TRIG'D	
5185194	Jan 07 2016 01:18:36.293876	OSCILOGRAFIA On	
5185193	Jan 07 2016 01:18:36.293876	TRIP GRAL On	
5185192	Jan 07 2016 01:18:36.291375	RETRIP 50BF On	
5185191	Jan 07 2016 01:18:36.291375	POTT OP 2T On	
5185190	Jan 07 2016 01:18:36.291375	TRIP 3-POLE	
5185189	Jan 07 2016 01:18:36.291375	TRIP PHASE C	
5185188	Jan 07 2016 01:18:36.291375	TRIP PHASE B	
5185187	Jan 07 2016 01:18:36.291375	TRIP PHASE A	
5185186	Jan 07 2016 01:18:36.291375	POTT OP	
5185185	Jan 07 2016 01:18:36.291375	POTT TRIP B	
5185184	Jan 07 2016 01:18:36.291375	PH DIST Z2 PKP AB	
5185183	Jan 07 2016 01:18:36.288877	URT REC ACEL On	
5185182	Jan 07 2016 01:18:36.288877	RECEPCION On	
5185181	Jan 07 2016 01:18:36.288877	RECEPCION 2T On	
5185180	Jan 07 2016 01:18:36.288877	RECEP ACELER On	
5185179	Jan 07 2016 01:18:36.288877	NEUTRAL TOC1 PKP	
5185178	Jan 07 2016 01:18:36.286246	RX RANCAGUA On	
5185177	Jan 07 2016 01:18:36.283876	FAULT RPT TRIG	
5185176	Jan 07 2016 01:18:36.281377	TX RANCAGUA On	
5185175	Jan 07 2016 01:18:36.281377	Tx RANCAGUA On	
5185174	Jan 07 2016 01:18:36.281377	LED Z2 On	
5185173	Jan 07 2016 01:18:36.281377	TX MMOO On	
5185172	Jan 07 2016 01:18:36.281377	pkp Z1o z2 On	
5185171	Jan 07 2016 01:18:36.281377	HYBRID POTT TX1	
5185170	Jan 07 2016 01:18:36.281377	POTT TX1	
5185169	Jan 07 2016 01:18:36.281377	GND DIST Z2 PKP B	
5185168	Jan 07 2016 01:18:36.278878	PHASE TOC1 PKP A	
5185167	Jan 07 2016 01:18:36.276378	GND DIST Z3 PKP B	
5185166	Jan 07 2016 01:18:36.276378	PH DIST Z3 PKP AB	
5185165	Jan 07 2016 01:18:36.271381	RESET OP(OPERAND)	
5185164	Jan 07 2016 01:18:36.268883	reset led On	
5185163	Jan 07 2016 01:18:36.268883	PHASE TOC1 PKP B	
5185162	Jan 07 2016 01:18:36.266384	NEG SEQ DIR OC1 FWD	

Event Number	Date/Time	Cause	Data
5185247	Jan 07 2016 01:26:27.986414	RECEP ACELER On	
5185246	Jan 07 2016 01:26:27.982856	RX RANCAGUA On	
5185245	Jan 07 2016 01:26:27.961370	PH DIST Z3 PKP AB	
5185244	Jan 07 2016 01:26:27.958876	PHASE TOC1 PKP B	
5185243	Jan 07 2016 01:26:27.958876	NEUTRAL TOC1 PKP	
5185242	Jan 07 2016 01:26:27.958876	NEUTRAL IOC1 PKP	
5185241	Jan 07 2016 01:26:27.955350	52A1 (a) On	
5185240	Jan 07 2016 01:26:27.953864	FAULT RPT TRIG	
5185239	Jan 07 2016 01:26:27.951361	TX RANCAGUA On	
5185238	Jan 07 2016 01:26:27.951361	Tx RANCAGUA On	
5185237	Jan 07 2016 01:26:27.951361	LED Z2 On	
5185236	Jan 07 2016 01:26:27.951361	TX MMOO On	
5185235	Jan 07 2016 01:26:27.951361	pkp Z1o z2 On	
5185234	Jan 07 2016 01:26:27.951361	HYBRID POTT TX1	
5185233	Jan 07 2016 01:26:27.951361	POTT TX1	
5185232	Jan 07 2016 01:26:27.951361	GND DIST Z2 PKP B	
5185231	Jan 07 2016 01:26:27.948842	RESET OP(OPERAND)	
5185230	Jan 07 2016 01:26:27.946338	reset led On	
5185229	Jan 07 2016 01:26:27.946338	GND DIST Z3 PKP B	
5185228	Jan 07 2016 01:26:27.946338	NEG SEQ DIR OC1 FWD	
5185227	Jan 07 2016 01:24:29.418739	RESET OP(PUSHBUTTON)	
5185226	Jan 07 2016 01:18:36.541144	URT REC ACEL Off	
5185225	Jan 07 2016 01:18:36.541144	ECHO COND 2T Off	
5185224	Jan 07 2016 01:18:36.541144	RECEPCION Off	
5185223	Jan 07 2016 01:18:36.541144	RECEPCION 2T Off	
5185222	Jan 07 2016 01:18:36.541144	RECEP ACELER Off	
5185221	Jan 07 2016 01:18:36.536794	RX RANCAGUA Off	
5185220	Jan 07 2016 01:18:36.358870	RETRIP 50BF Off	
5185219	Jan 07 2016 01:18:36.358870	reset led Off	
5185218	Jan 07 2016 01:18:36.358870	PHASE TOC1 DPO B	
5185217	Jan 07 2016 01:18:36.358870	NEUTRAL TOC1 DPO	
5185216	Jan 07 2016 01:18:36.353869	URT TRIP S1 Off	
5185215	Jan 07 2016 01:18:36.353869	PRUEBA D60 Off	
5185214	Jan 07 2016 01:18:36.353869	TRIP BD1 Off	
5185213	Jan 07 2016 01:18:36.353869	OSCILOGRAFIA Off	
5185212	Jan 07 2016 01:18:36.353869	TRIP GRAL Off	
5185211	Jan 07 2016 01:18:36.351370	POTT OP 2T Off	
5185210	Jan 07 2016 01:18:36.351370	LED Z2 Off	
5185209	Jan 07 2016 01:18:36.351370	pkp Z1o z2 Off	
5185208	Jan 07 2016 01:18:36.351370	GND DIST Z3 DPO B	
5185207	Jan 07 2016 01:18:36.351370	GND DIST Z2 DPO B	
5185206	Jan 07 2016 01:18:36.346371	ECHO COND 2T On	
5185205	Jan 07 2016 01:18:36.343760	52A1 (a) Off	

Event Number	Date/Time	Cause	Data
5185289	Jan 07 2016 01:26:28.146658	RECEPCION 2T Off	
5185288	Jan 07 2016 01:26:28.146658	RECEP ACELER Off	
5185287	Jan 07 2016 01:26:28.143395	RX RANCAGUA Off	
5185286	Jan 07 2016 01:26:28.018985	reset led Off	
5185285	Jan 07 2016 01:26:28.018985	NEUTRAL TOC1 DPO	
5185284	Jan 07 2016 01:26:28.011469	RETRIP 50BF Off	
5185283	Jan 07 2016 01:26:28.008965	URT TRIP S1 Off	
5185282	Jan 07 2016 01:26:28.008965	PRUEBA D60 Off	
5185281	Jan 07 2016 01:26:28.008965	TRIP BD1 Off	
5185280	Jan 07 2016 01:26:28.008965	50-50N Off	
5185279	Jan 07 2016 01:26:28.008965	OSCILOGRAFIA Off	
5185278	Jan 07 2016 01:26:28.008965	TRIP GRAL Off	
5185277	Jan 07 2016 01:26:28.008965	PHASE TOC1 DPO B	
5185276	Jan 07 2016 01:26:28.008965	NEUTRAL IOC1 DPO	
5185275	Jan 07 2016 01:26:28.006459	GND DIST Z3 DPO B	
5185274	Jan 07 2016 01:26:28.001449	TX RANCAGUA Off	
5185273	Jan 07 2016 01:26:28.001449	POTT OP 2T Off	
5185272	Jan 07 2016 01:26:28.001449	Tx RANCAGUA Off	
5185271	Jan 07 2016 01:26:28.001449	LED Z2 Off	
5185270	Jan 07 2016 01:26:28.001449	TX MMOO Off	
5185269	Jan 07 2016 01:26:28.001449	pkp Z1o z2 Off	
5185268	Jan 07 2016 01:26:28.001449	GND DIST Z2 DPO B	
5185267	Jan 07 2016 01:26:27.996432	ECHO COND 2T On	
5185266	Jan 07 2016 01:26:27.994356	52A1 (a) Off	
5185265	Jan 07 2016 01:26:27.991423	PH DIST Z3 DPO AB	
5185264	Jan 07 2016 01:26:27.988919	URT TRIP S1 On	
5185263	Jan 07 2016 01:26:27.988919	PRUEBA D60 On	
5185262	Jan 07 2016 01:26:27.988919	RETRIP 50BF On	
5185261	Jan 07 2016 01:26:27.988919	TRIP BD1 On	
5185260	Jan 07 2016 01:26:27.988919	OSCILLOGRAPHY TRIG'D	
5185259	Jan 07 2016 01:26:27.988919	POTT OP 2T On	
5185258	Jan 07 2016 01:26:27.988919	50-50N On	
5185257	Jan 07 2016 01:26:27.988919	OSCILOGRAFIA On	
5185256	Jan 07 2016 01:26:27.988919	TRIP GRAL On	
5185255	Jan 07 2016 01:26:27.988919	TRIP 3-POLE	
5185254	Jan 07 2016 01:26:27.988919	TRIP PHASE B	
5185253	Jan 07 2016 01:26:27.988919	POTT OP	
5185252	Jan 07 2016 01:26:27.988919	POTT TRIP B	
5185251	Jan 07 2016 01:26:27.988919	NEUTRAL IOC1 OP	
5185250	Jan 07 2016 01:26:27.986414	URT REC ACEL On	
5185249	Jan 07 2016 01:26:27.986414	RECEPCION On	
5185248	Jan 07 2016 01:26:27.986414	RECEPCION 2T On	
5185247	Jan 07 2016 01:26:27.986414	RECEP ACELER On	

Figura 23: Registro de eventos

Siemens 7SA612, paño A1, S/E Alto Jahuel – Sistema 2.



Event Log - 07-01-2016 8:40:05.790 - Fallas / L154kVTing-Ran-Aja070115 / Alto Jahuel / 52A1_C1 / 7SA612 V4.6 Var1-

Number	Indication	Value	Date and time	Initiator	Cause	S
00301	Power System fault	3760 - ON	07.01.2016 01:18:36.273	Com.Issued=Aut...	Spontaneous	
04056	85-21 Carrier SEND signal	ON	07.01.2016 01:18:36.273	Com.Issued=Aut...	Spontaneous	
30053	Fault recording is running	ON	07.01.2016 01:18:36.276	Com.Issued=Aut...	Spontaneous	
04006	>85-21 Carrier RECEPTION, Channel 1	ON	07.01.2016 01:18:36.289	Com.Issued=Aut...	Spontaneous	
00301	Power System fault	3760 - OFF	07.01.2016 01:18:36.403	Com.Issued=Aut...	Spontaneous	
30053	Fault recording is running	OFF	07.01.2016 01:18:36.467	Com.Issued=Aut...	Spontaneous	
04006	>85-21 Carrier RECEPTION, Channel 1	OFF	07.01.2016 01:18:36.539	Com.Issued=Aut...	Spontaneous	
	Reset LED	ON	07.01.2016 01:24:20.673	Command Issue...	Spontaneous	
00060	Reset LED	ON	07.01.2016 01:24:20.673	Com.Issued=Aut...	Spontaneous	
00301	Power System fault	3761 - ON	07.01.2016 01:26:27.941	Com.Issued=Aut...	Spontaneous	
00590	Line closure detected	ON	07.01.2016 01:26:27.943	Com.Issued=Aut...	Spontaneous	
04056	85-21 Carrier SEND signal	ON	07.01.2016 01:26:27.944	Com.Issued=Aut...	Spontaneous	
30053	Fault recording is running	ON	07.01.2016 01:26:27.949	Com.Issued=Aut...	Spontaneous	
	Reset LED	ON	07.01.2016 01:26:27.962	Com.Issued=Aut...	Spontaneous	
00060	Reset LED	ON	07.01.2016 01:26:27.962	Com.Issued=Aut...	Spontaneous	
04006	>85-21 Carrier RECEPTION, Channel 1	ON	07.01.2016 01:26:27.987	Com.Issued=Aut...	Spontaneous	
00590	Line closure detected	OFF	07.01.2016 01:26:27.995	Com.Issued=Aut...	Spontaneous	
00301	Power System fault	3761 - OFF	07.01.2016 01:26:28.072	Com.Issued=Aut...	Spontaneous	
30053	Fault recording is running	OFF	07.01.2016 01:26:28.127	Com.Issued=Aut...	Spontaneous	
04006	>85-21 Carrier RECEPTION, Channel 1	OFF	07.01.2016 01:26:28.147	Com.Issued=Aut...	Spontaneous	

Trip Log - 003760 / 07-01-2016 1:18:36.273 - Fallas / L154kVTing-Ran-Aja070115 / Alto Jahue...

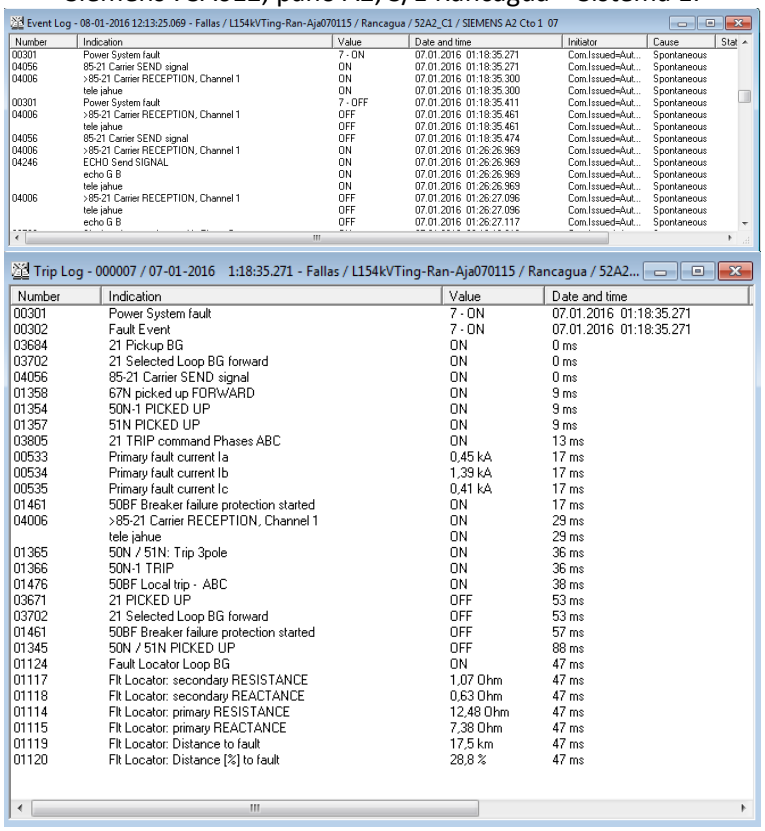
Number	Indication	Value	Date and time
00301	Power System fault	3760 - ON	07.01.2016 01:18:36.273
00302	Fault Event	3760 - ON	07.01.2016 01:18:36.273
03684	21 Pickup BG	ON	0 ms
03702	21 Selected Loop BG forward	ON	0 ms
04056	85-21 Carrier SEND signal	ON	0 ms
01358	67N picked up FORWARD	ON	6 ms
01357	51N PICKED UP	ON	6 ms
04006	>85-21 Carrier RECEPTION, Channel 1	ON	16 ms
03805	21 TRIP command Phases ABC	ON	16 ms
00533	Primary fault current Ia	0,91 kA	19 ms
00534	Primary fault current Ib	1,98 kA	19 ms
00535	Primary fault current Ic	0,58 kA	19 ms
01461	50BF Breaker failure protection started	ON	19 ms
01476	50BF Local trip - ABC	ON	39 ms
01461	50BF Breaker failure protection started	OFF	72 ms
03671	21 PICKED UP	OFF	88 ms
03702	21 Selected Loop BG forward	OFF	88 ms
01345	50N / 51N PICKED UP	OFF	93 ms
01124	Fault Locator Loop BG	ON	54 ms
01117	Flt Locator: secondary RESISTANCE	1,50 Ohm	54 ms
01118	Flt Locator: secondary REACTANCE	2,10 Ohm	54 ms
01114	Flt Locator: primary RESISTANCE	17,55 Ohm	54 ms
01115	Flt Locator: primary REACTANCE	24,49 Ohm	54 ms
01119	Flt Locator: Distance to fault	59,7 km	54 ms
01120	Flt Locator: Distance [%] to fault	98,4 %	54 ms

Trip Log - 003761 / 07-01-2016 1:26:27.941 - Fallas / L154kVTing-Ran-Aja070115 / Alto Jahuel / 52...

Number	Indication	Value	Date and time
00301	Power System fault	3761 - ON	07.01.2016 01:26:27.941
00302	Fault Event	3761 - ON	07.01.2016 01:26:27.941
04283	50HS Pickup Phase B	ON	0 ms
04295	50HS SOTF-O/C TRIP command Phases ABC	ON	0 ms
00590	Line closure detected	ON	2 ms
00533	Primary fault current Ia	0,02 kA	2 ms
00534	Primary fault current Ib	1,89 kA	2 ms
00535	Primary fault current Ic	0,02 kA	2 ms
03684	21 Pickup BG	ON	2 ms
03702	21 Selected Loop BG forward	ON	2 ms
04056	85-21 Carrier SEND signal	ON	3 ms
03805	21 TRIP command Phases ABC	ON	3 ms
01461	50BF Breaker failure protection started	ON	4 ms
01358	67N picked up FORWARD	ON	15 ms
01354	50N-1 PICKED UP	ON	15 ms
01357	51N PICKED UP	ON	15 ms
01476	50BF Local trip - ABC	ON	24 ms
01365	50N / 51N: Trip 3pole	ON	45 ms
01366	50N-1 TRIP	ON	45 ms
04006	>85-21 Carrier RECEPTION, Channel 1	ON	46 ms
00590	Line closure detected	OFF	54 ms
03671	21 PICKED UP	OFF	55 ms
03702	21 Selected Loop BG forward	OFF	55 ms
01461	50BF Breaker failure protection started	OFF	59 ms
04281	50HS PICKED UP	OFF	84 ms
01345	50N / 51N PICKED UP	OFF	85 ms
01124	Fault Locator Loop BG	ON	40 ms
01117	Flt Locator: secondary RESISTANCE	0,46 Ohm	40 ms
01118	Flt Locator: secondary REACTANCE	1,72 Ohm	40 ms
01114	Flt Locator: primary RESISTANCE	5,36 Ohm	40 ms
01115	Flt Locator: primary REACTANCE	20,06 Ohm	40 ms
01119	Flt Locator: Distance to fault	48,9 km	40 ms
01120	Flt Locator: Distance [%] to fault	80,6 %	40 ms

Figura 24: Registro de eventos

Siemens 7SA612, paño A2, S/E Rancagua – Sistema 1.



Event Log - 08-01-2016 12:13:25.069 - Fallas / L154kVTing-Ran-Aja070115 / Rancagua / 52A2_C1 / SIEMENS A2 Cto 1 07

Number	Indication	Value	Date and time	Initiator	Cause	Stat
00301	Power System fault	7 - ON	07.01.2016 01:18:35.271	Com.Issued=Aut...	Spontaneous	
04056	85-21 Carrier SEND signal	ON	07.01.2016 01:18:35.271	Com.Issued=Aut...	Spontaneous	
04006	>85-21 Carrier RECEPTION, Channel 1	ON	07.01.2016 01:18:35.300	Com.Issued=Aut...	Spontaneous	
	tele jahue	ON	07.01.2016 01:18:35.300	Com.Issued=Aut...	Spontaneous	
00301	Power System fault	7 - OFF	07.01.2016 01:18:35.411	Com.Issued=Aut...	Spontaneous	
04006	>85-21 Carrier RECEPTION, Channel 1	OFF	07.01.2016 01:18:35.461	Com.Issued=Aut...	Spontaneous	
	tele jahue	OFF	07.01.2016 01:18:35.461	Com.Issued=Aut...	Spontaneous	
04056	85-21 Carrier SEND signal	OFF	07.01.2016 01:18:35.474	Com.Issued=Aut...	Spontaneous	
04006	>85-21 Carrier RECEPTION, Channel 1	ON	07.01.2016 01:26:26.969	Com.Issued=Aut...	Spontaneous	
04246	ECHO Send SIGNAL	ON	07.01.2016 01:26:26.969	Com.Issued=Aut...	Spontaneous	
	echo G B	ON	07.01.2016 01:26:26.969	Com.Issued=Aut...	Spontaneous	
	tele jahue	ON	07.01.2016 01:26:26.969	Com.Issued=Aut...	Spontaneous	
04006	>85-21 Carrier RECEPTION, Channel 1	OFF	07.01.2016 01:26:27.096	Com.Issued=Aut...	Spontaneous	
	tele jahue	OFF	07.01.2016 01:26:27.096	Com.Issued=Aut...	Spontaneous	
	echo G B	OFF	07.01.2016 01:26:27.117	Com.Issued=Aut...	Spontaneous	

Trip Log - 000007 / 07-01-2016 1:18:35.271 - Fallas / L154kVTing-Ran-Aja070115 / Rancagua / 52A2...

Number	Indication	Value	Date and time
00301	Power System fault	7 - ON	07.01.2016 01:18:35.271
00302	Fault Event	7 - ON	07.01.2016 01:18:35.271
03684	21 Pickup BG	ON	0 ms
03702	21 Selected Loop BG forward	ON	0 ms
04056	85-21 Carrier SEND signal	ON	0 ms
01358	67N picked up FORWARD	ON	9 ms
01354	50N-1 PICKED UP	ON	9 ms
01357	51N PICKED UP	ON	9 ms
03805	21 TRIP command Phases ABC	ON	13 ms
00533	Primary fault current Ia	0,45 kA	17 ms
00534	Primary fault current Ib	1,39 kA	17 ms
00535	Primary fault current Ic	0,41 kA	17 ms
01461	50BF Breaker failure protection started	ON	17 ms
04006	>85-21 Carrier RECEPTION, Channel 1	ON	29 ms
	tele jahue	ON	29 ms
01365	50N / 51N: Trip 3pole	ON	36 ms
01366	50N-1 TRIP	ON	36 ms
01476	50BF Local trip - ABC	ON	38 ms
03671	21 PICKED UP	OFF	53 ms
03702	21 Selected Loop BG forward	OFF	53 ms
01461	50BF Breaker failure protection started	OFF	57 ms
01345	50N / 51N PICKED UP	OFF	88 ms
01124	Fault Locator Loop BG	ON	47 ms
01117	Flt Locator: secondary RESISTANCE	1,07 Ohm	47 ms
01118	Flt Locator: secondary REACTANCE	0,63 Ohm	47 ms
01114	Flt Locator: primary RESISTANCE	12,48 Ohm	47 ms
01115	Flt Locator: primary REACTANCE	7,38 Ohm	47 ms
01119	Flt Locator: Distance to fault	17,5 km	47 ms
01120	Flt Locator: Distance [%] to fault	28,8 %	47 ms

CONTROL DE REVISIÓN DEL CRAP

REVISOR	FECHA	N° EAP	OBSERVACIONES
Max Missene M.	07-09-2015	Nº 75/2015	Cambio de ajustes para evitar que la Z1B actúe de forma instantánea en Sistema 2 protección Siemens 7SA61 .

Razón de TTCC/TTPP

TTCC: 600/5

TTPP: $\frac{161000}{\sqrt{3}}/115/\frac{115}{\sqrt{3}}$

Particularidades de Ajustes

- No hay.

ALTO JAHUEL_LIATING-RGUA1_GE D60_110804.URS
Y:\CRAP\ARCHIVOS DE CONFIGURACIÝN\03_OCC\ALTO JAHUEL
DEVICE DEFINITION
FILES
ORDER CODE: D60-G00-HCH-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

PRODUCT SETUP

DISPLAY PROPERTIES

Flash Message Time	1.0 s
Default Message Timeout	60 s
Default Message Intensity (VFD Only)	25 %
Screen Saver Feature (LCD Only)	Enabled
Screen Saver Wait Time (LCD Only)	30 min
Current Cutoff Level	0.020 pu
Voltage Cutoff Level	1.0 V

COMMUNICATIONS

SERIAL PORTS

RS485 Com2 Baud Rate	19200
RS485 Com2 Parity	None
RS485 Com2 Response Min Time	0 ms

NETWORK

IP Address	10. 80.153.212
IP Subnet Mask	255.255.255. 0
Gateway IP Address	10. 80.153.210
Ethernet Operation Mode	Full-Duplex

MODBUS PROTOCOL

Modbus Slave Address	254
Modbus TCP Port Number	502

HTTP

HTTP TCP Port Number	80

TFTP

TFTP Main UDP Port Number	69
TFTP Data UDP Port Number 1	0
TFTP Data UDP Port Number 2	0

REAL TIME CLOCK

IRIG-B Signal Type	Amplitude Modulated
Real Time Clock Events	Enabled

FAULT REPORT

Fault Report 1 Source	LINEA (SRC 1)
Fault Report 1 Trigger	pkp Z1o z2 On (VO4)
Fault Report 1 Positive Seq (Z1) Mag	2.04 ohms
Fault Report 1 Positive Seq (Z1) Angle	77 deg
Fault Report 1 Zero Seq (Z0) Mag	7.16 ohms
Fault Report 1 Zero Seq (Z0) Angle	79 deg
Fault Report 1 Line Length Units	km
Fault Report 1 Line Length	50.6

OSCILLOGRAPHY

Number Of Records	5
Trigger Mode	Automatic Overwrite
Trigger Position	30 %
Trigger Source	OSCILOGRAFIA On (VO3)
AC Input Waveforms	32 samples/cycle
Digital Channel 1	PH DIST Z1 OP
Digital Channel 2	PH DIST Z2 OP
Digital Channel 3	PH DIST Z3 OP
Digital Channel 4	PH DIST Z4 OP
Digital Channel 5	GND DIST Z1 OP
Digital Channel 6	GND DIST Z2 OP
Digital Channel 7	GND DIST Z3 OP
Digital Channel 8	GND DIST Z4 OP
Digital Channel 9	PHASE TOC1 OP
Digital Channel 10	PH DIR1 BLK
Digital Channel 11	NEUTRAL TOC1 OP
Digital Channel 12	NTRL DIR OC1 REV
Digital Channel 13	NEG SEQ DIR OC1 FWD
Digital Channel 14	PUTT OP
Digital Channel 15	POWER SWING BLOCK
Digital Channel 16	PH DIST Z1 PKP

ALTO JAHUEL_LIATING-RGUA1_GE D60_110804.URS
Y:\CRAP\ARCHIVOS DE CONFIGURACIÝN\03_OCC\ALTO JAHUEL
DEVICE DEFINITION
FILES
ORDER CODE: D60-G00-HCH-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

OSCILLOGRAPHY (continued from last page)

Digital Channel 17	PH DIST Z2 PKP
Digital Channel 18	PH DIST Z3 PKP
Digital Channel 19	PH DIST Z4 PKP
Digital Channel 20	LINE PICKUP OP
Digital Channel 21	PHASE TOC1 OP
Digital Channel 22	AR 1-P RIP
Digital Channel 23	AR CLOSE BKR 1
Digital Channel 24	AR FORCE 3-P TRIP
Digital Channel 25	SYNC 1 SYNC OP
Digital Channel 26	Cont Ip 13 On(W3a)
Digital Channel 27	52A1 (a) On(H7a)
Digital Channel 28	79 conectado On(H7c)
Digital Channel 29	86B--> 50BF On(H8a)
Digital Channel 30	Cont Ip 7 On(U8a)
Digital Channel 31	Cont Ip 8 On(U8c)
Digital Channel 32	RX ITAHUE On(W1a)
Digital Channel 33	80 SISTEMA 1 On(W1c)
Digital Channel 34	Cont Ip 16 On(W4c)
Digital Channel 35	Cont Ip 17 On(W5a)
Digital Channel 36	GND DIST Z1 PKP
Digital Channel 37	GND DIST Z2 PKP
Digital Channel 38	GND DIST Z3 PKP
Digital Channel 39	GND DIST Z4 PKP
Digital Channel 40	HYBRID POTT TX1
Digital Channel 42	BLQ Zonas PH On (VO1)
Digital Channel 43	TRIP GRAL On (VO2)
Digital Channel 44	pkp Z1o z2 On (VO4)
Digital Channel 45	BLOq reconec On (VO5)
Digital Channel 46	ORD. CIERRE On (VO6)
Digital Channel 47	BL-NTCO On (VO7)
Digital Channel 48	POWER SWING 50DD
Digital Channel 49	SETTING GROUP ACT 1
Digital Channel 50	SETTING GROUP ACT 2
Digital Channel 51	POWER SWING UN/BLOCK
Digital Channel 52	AR BKR 1 BLK
Digital Channel 53	AR CLOSE BKR 1
Digital Channel 54	AR INCOMPLETE SEQ
Digital Channel 55	SYNC 1 CLS OP
Digital Channel 56	SYNC 1 SYNC OP
Digital Channel 57	PH DIR1 BLK
Digital Channel 58	PHASE SELECT 3P
Digital Channel 59	86B -154 KV Off(W2c)
Analog Channel 1	SRC1 I_0 Mag
Analog Channel 2	SRC1 Ib Mag
Analog Channel 3	SRC1 Ic Mag
Analog Channel 4	SRC1 Ia Angle
Analog Channel 5	SRC1 Ib Angle
Analog Channel 6	SRC1 Ic Angle
Analog Channel 7	SRC1 Vag Mag
Analog Channel 8	SRC1 Vbg Mag
Analog Channel 9	SRC1 Vcg Mag
Analog Channel 10	SRC1 Vag Angle
Analog Channel 11	SRC1 Vbg Angle
Analog Channel 12	SRC1 Vcg Angle
Analog Channel 13	SRC1 V_1 Mag
Analog Channel 14	SRC1 V_1 Angle
Analog Channel 15	SRC1 Frequency
Analog Channel 16	Tracking Frequency

DATA LOGGER

Data Logger Mode	Continuous
Data Logger Trigger	OFF
Rate	60000 msec

USER-PROGRAMMABLE LEDS

LED TEST

Function	Enabled
Control	CONTROL PUSHBUTTON 3 ON

ALTO JAHUEL_LIATING-RGUA1_GE D60_110804.URS
Y:\CRAP\ARCHIVOS DE CONFIGURACIÝN\03_OCC\ALTO JAHUEL
DEVICE DEFINITION
FILES
ORDER CODE: D60-G00-HCH-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

TRIP AND ALARMS LEDS

Trip LED Input	TRIP GRAL On (VO2)

USER PROGRAMMABLE LEDS

LED 1: OPERAND	RECEPCION On (VO41)
LED 1: TYPE	Latched
LED 2: OPERAND	LED Z1 On (VO13)
LED 2: TYPE	Latched
LED 3: OPERAND	LED Z2 On (VO14)
LED 3: TYPE	Latched
LED 4: OPERAND	LED Z3 On (VO15)
LED 4: TYPE	Latched
LED 5: OPERAND	LED Z4 On (VO16)
LED 5: TYPE	Latched
LED 6: OPERAND	LED Z5 On (VO35)
LED 6: TYPE	Latched
LED 7: OPERAND	79 on On (VO17)
LED 7: TYPE	Self-Reset
LED 8: OPERAND	79 off On (VO18)
LED 8: TYPE	Self-Reset
LED 9: OPERAND	LINE PICKUP OP
LED 9: TYPE	Latched
LED 10: OPERAND	52A1 (a) Off(H7a)
LED 10: TYPE	Self-Reset
LED 11: OPERAND	52A1 (a) On(H7a)
LED 11: TYPE	Self-Reset
LED 12: OPERAND	FALLA RELE On(U7a)
LED 12: TYPE	Self-Reset
LED 13: OPERAND	67N On (VO32)
LED 13: TYPE	Latched
LED 14: OPERAND	51-51N On (VO33)
LED 14: TYPE	Latched
LED 15: OPERAND	50-50N On (VO34)
LED 15: TYPE	Latched
LED 16: OPERAND	AR 3-P/1 RIP
LED 16: TYPE	Self-Reset
LED 17: OPERAND	AR LO
LED 17: TYPE	Self-Reset
LED 18: OPERAND	POWER SWING UN/BLOCK
LED 18: TYPE	Latched
LED 25: OPERAND	SELECTOR 1 POS 1
LED 25: TYPE	Self-Reset
LED 26: OPERAND	SELECTOR 1 POS 2
LED 26: TYPE	Self-Reset
LED 27: OPERAND	SETTING GROUP ACT 1
LED 27: TYPE	Self-Reset
LED 28: OPERAND	SETTING GROUP ACT 2
LED 28: TYPE	Self-Reset
LED 29: OPERAND	SETTING GROUP ACT 3
LED 29: TYPE	Self-Reset

USER-PROGRAMMABLE SELF TESTS

Battery Fail Function	Enabled

CONTROL PUSHBUTTONS

CPB 1: Function	Enabled
CPB 1: Events	Enabled
CPB 2: Function	Enabled
CPB 2: Events	Enabled
CPB 3: Function	Enabled
CPB 3: Events	Disabled

USER-DEFINABLE DISPLAYS

USER DISPLAY 1: Top Line	L 154 KV TINGUIRI 1
USER DISPLAY 1: Bottom Line	SISTEMA 1
USER DISPLAY 1: Item 1	0
USER DISPLAY 1: Item 2	0
USER DISPLAY 1: Item 3	0
USER DISPLAY 1: Item 4	0
USER DISPLAY 1: Item 5	0

ALTO JAHUEL_LIATING-RGUA1_GE D60_110804.URS
Y:\CRAP\ARCHIVOS DE CONFIGURACIÝN\03_OCC\ALTO JAHUEL
DEVICE DEFINITION
FILES
ORDER CODE: D60-G00-HCH-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

USER-DEFINABLE DISPLAYS (continued from last page)

USER DISPLAY 2: Top Line	LOCALIZACION FALLA
USER DISPLAY 2: Bottom Line	~ km
USER DISPLAY 2: Item 1	9061
USER DISPLAY 2: Item 2	0
USER DISPLAY 2: Item 3	0
USER DISPLAY 2: Item 4	0
USER DISPLAY 2: Item 5	0
USER DISPLAY 3: Top Line	IA IB IC
USER DISPLAY 3: Bottom Line	~ ~ ~
USER DISPLAY 3: Item 1	6144
USER DISPLAY 3: Item 2	6146
USER DISPLAY 3: Item 3	6148
USER DISPLAY 3: Item 4	0
USER DISPLAY 3: Item 5	0
USER DISPLAY 4: Top Line	FAULT REPORTS
USER DISPLAY 4: Bottom Line	
USER DISPLAY 4: Item 1	0
USER DISPLAY 4: Item 2	0
USER DISPLAY 4: Item 3	0
USER DISPLAY 4: Item 4	0
USER DISPLAY 4: Item 5	0
USER DISPLAY 5: Top Line	ACTUAL VALUES
USER DISPLAY 5: Bottom Line	PRODUCT INFO
USER DISPLAY 5: Item 1	0
USER DISPLAY 5: Item 2	0
USER DISPLAY 5: Item 3	0
USER DISPLAY 5: Item 4	0
USER DISPLAY 5: Item 5	0
USER DISPLAY 6: Top Line	OPERATING TIME:
USER DISPLAY 6: Bottom Line	~
USER DISPLAY 6: Item 1	61952
USER DISPLAY 6: Item 2	0
USER DISPLAY 6: Item 3	0
USER DISPLAY 6: Item 4	0
USER DISPLAY 6: Item 5	0
Invoke and Scroll	ON

INSTALLATION

Relay Name	AJAA1-TINGUIRIRICA 1

SYSTEM SETUP

AC INPUTS

CURRENT

CT F1: Phase CT Primary	600 A
CT F1: Phase CT Secondary	5 A
CT F1: Ground CT Primary	600 A
CT F1: Ground CT Secondary	5 A

VOLTAGE

VT F5: Phase VT Connection	Wye
VT F5: Phase VT Secondary	63.5 V
VT F5: Phase VT Ratio	1400.00 :1
VT F5: Auxiliary VT Connection	Vbg
VT F5: Auxiliary VT Secondary	63.5 V
VT F5: Auxiliary VT Ratio	1400.00 :1

POWER SYSTEM

Nominal Frequency	50 Hz
Phase Rotation	ABC
Frequency And Phase Reference	LINEA (SRC 1)
Frequency Tracking Function	Enabled

SIGNAL SOURCES

SOURCE 1: Name	LINEA
SOURCE 1: Phase CT	F1
SOURCE 1: Ground CT	F1
SOURCE 1: Phase VT	F5
SOURCE 1: Auxiliary VT	None
SOURCE 2: Name	BARRA

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DESCRIPTION: (NONE)
TEXT COLOR

SIGNAL SOURCES (continued from last page)

SOURCE 2: Phase CT	None
SOURCE 2: Ground CT	None
SOURCE 2: Phase VT	None
SOURCE 2: Auxiliary VT	F5

BREAKERS

Breaker 1 Function	Enabled
Breaker 1 Push Button Control	Disabled
Breaker 1 Name	52A1
Breaker 1 Mode	3-Pole
Breaker 1 Open	OFF
Breaker 1 Close	OFF
Breaker 1 Phase A/3-Pole	52A1 (a) On(H7a)
Breaker 1 Phase B	OFF
Breaker 1 Phase C	OFF
Breaker 1 External Alarm	OFF
Breaker 1 Alarm Delay	0.000 s
Breaker 1 Manual Close Recal Time	0.000 s
Breaker 1 Out Of Service	OFF

FLEXLOGIC

FLEXLOGIC EQUATION EDITOR

FlexLogic Entry 1	POWER SWING BLOCK
FlexLogic Entry 2	NEG SEQ DIR OC1 FWD
FlexLogic Entry 3	NOT
FlexLogic Entry 4	AND(2)
FlexLogic Entry 5	= POWER SWING (VO8)
FlexLogic Entry 6	POWER SWING UN/BLOCK
FlexLogic Entry 7	SRC1 VT FUSE FAIL OP
FlexLogic Entry 8	OR(2)
FlexLogic Entry 9	= BLQ Zonas PH (VO1)
FlexLogic Entry 10	PH DIST Z1 OP
FlexLogic Entry 11	PH DIST Z2 OP
FlexLogic Entry 12	PH DIST Z3 OP
FlexLogic Entry 13	PH DIST Z4 OP
FlexLogic Entry 14	GND DIST Z1 OP
FlexLogic Entry 15	GND DIST Z2 OP
FlexLogic Entry 16	GND DIST Z3 OP
FlexLogic Entry 17	GND DIST Z4 OP
FlexLogic Entry 18	PHASE TOC1 OP
FlexLogic Entry 19	NEUTRAL TOC1 OP
FlexLogic Entry 20	PHASE TOC2 OP
FlexLogic Entry 21	NEUTRAL TOC2 OP
FlexLogic Entry 22	PHASE IOC1 OP
FlexLogic Entry 23	NEUTRAL IOC1 OP
FlexLogic Entry 24	HYBRID POTT OP
FlexLogic Entry 25	LINE PICKUP OP
FlexLogic Entry 26	OR(16)
FlexLogic Entry 27	PH DIST Z5 OP
FlexLogic Entry 28	GND DIST Z5 OP
FlexLogic Entry 29	POTT OP 2T On (VO50)
FlexLogic Entry 30	OR(3)
FlexLogic Entry 31	OR(2)
FlexLogic Entry 32	= TRIP GRAL (VO2)
FlexLogic Entry 33	BLQ Zonas PH On (VO1)
FlexLogic Entry 34	TRIP GRAL On (VO2)
FlexLogic Entry 35	86B -154 KV On(W2c)
FlexLogic Entry 36	POWER SWING BLOCK
FlexLogic Entry 37	OR(4)
FlexLogic Entry 38	= OSCILOGRAFIA (VO3)
FlexLogic Entry 39	PH DIST Z1 PKP
FlexLogic Entry 40	GND DIST Z1 PKP
FlexLogic Entry 41	PH DIST Z2 PKP
FlexLogic Entry 42	GND DIST Z2 PKP
FlexLogic Entry 43	OR(4)
FlexLogic Entry 44	= pkp Z1o z2 (VO4)
FlexLogic Entry 45	AR CLOSE BKR 1
FlexLogic Entry 46	SYNC 1 CLS OP
FlexLogic Entry 47	AND(2)

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TEXT COLOR

FLEXLOGIC EQUATION EDITOR (continued from last page)

FlexLogic Entry 48	= ORD. CIERRE (VO6)
FlexLogic Entry 49	AR LO
FlexLogic Entry 50	TIMER 1
FlexLogic Entry 51	= RESET 79 (VO10)
FlexLogic Entry 52	BKR FAIL 1 T1 OP
FlexLogic Entry 53	HYBRID POTT TX2
FlexLogic Entry 54	TIMER 2
FlexLogic Entry 55	OR(2)
FlexLogic Entry 56	= Tx OPLAT (VO11)
FlexLogic Entry 57	BKR FAIL 1 T1 OP
FlexLogic Entry 58	HYBRID POTT TX1
FlexLogic Entry 59	TIMER 3
FlexLogic Entry 60	OR(2)
FlexLogic Entry 61	= TX MMOO (VO12)
FlexLogic Entry 62	GND DIST Z1 OP
FlexLogic Entry 63	PH DIST Z1 OP
FlexLogic Entry 64	OR(2)
FlexLogic Entry 65	= LED Z1 (VO13)
FlexLogic Entry 66	GND DIST Z2 OP
FlexLogic Entry 67	PH DIST Z2 OP
FlexLogic Entry 68	GND DIST Z2 PKP
FlexLogic Entry 69	PH DIST Z2 PKP
FlexLogic Entry 70	OR(4)
FlexLogic Entry 71	= LED Z2 (VO14)
FlexLogic Entry 72	PH DIST Z3 OP
FlexLogic Entry 73	GND DIST Z3 OP
FlexLogic Entry 74	OR(2)
FlexLogic Entry 75	= LED Z3 (VO15)
FlexLogic Entry 76	PH DIST Z4 OP
FlexLogic Entry 77	GND DIST Z4 OP
FlexLogic Entry 78	OR(2)
FlexLogic Entry 79	= LED Z4 (VO16)
FlexLogic Entry 80	79 conectado On(H7c)
FlexLogic Entry 81	SELECTOR 1 POS 1
FlexLogic Entry 82	AND(2)
FlexLogic Entry 83	= 79 on (VO17)
FlexLogic Entry 84	79 on On (VO17)
FlexLogic Entry 85	NOT
FlexLogic Entry 86	= 79 off (VO18)
FlexLogic Entry 87	PH DIST Z1 PKP
FlexLogic Entry 88	PH DIST Z2 PKP
FlexLogic Entry 89	PH DIST Z3 PKP
FlexLogic Entry 90	PH DIST Z4 PKP
FlexLogic Entry 91	GND DIST Z1 PKP
FlexLogic Entry 92	GND DIST Z2 PKP
FlexLogic Entry 93	GND DIST Z3 PKP
FlexLogic Entry 94	GND DIST Z4 PKP
FlexLogic Entry 95	PHASE TOC1 PKP
FlexLogic Entry 96	NEUTRAL TOC1 PKP
FlexLogic Entry 97	LINE PICKUP PKP
FlexLogic Entry 98	OR(11)
FlexLogic Entry 99	= reset led (VO19)
FlexLogic Entry 100	ANY MAJOR ERROR
FlexLogic Entry 101	DSP ERROR
FlexLogic Entry 102	EEPROM DATA ERROR
FlexLogic Entry 103	BATTERY FAIL
FlexLogic Entry 104	NOR(4)
FlexLogic Entry 105	= FALLA RELE (VO21)
FlexLogic Entry 106	RX RANCAGUA On(H8c)
FlexLogic Entry 107	= RECEP ACELER (VO22)
FlexLogic Entry 108	PH DIST Z1 OP
FlexLogic Entry 109	GND DIST Z1 OP
FlexLogic Entry 110	OR(2)
FlexLogic Entry 111	= OPERA ZONA 1 (VO23)
FlexLogic Entry 112	PH DIST Z2 OP
FlexLogic Entry 113	GND DIST Z2 OP
FlexLogic Entry 114	OR(2)
FlexLogic Entry 115	= OPERA ZONA 2 (VO24)
FlexLogic Entry 116	PH DIST Z3 OP

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TEXT COLOR

FLEXLOGIC EQUATION EDITOR (continued from last page)

FlexLogic Entry 117	GND DIST Z3 OP
FlexLogic Entry 118	OR(2)
FlexLogic Entry 119	= OPERA Z3 (VO25)
FlexLogic Entry 120	PHASE TOC1 OP
FlexLogic Entry 121	NEUTRAL TOC1 OP
FlexLogic Entry 122	OR(2)
FlexLogic Entry 123	= 67-67N (VO27)
FlexLogic Entry 124	PHASE TOC2 OP
FlexLogic Entry 125	NEUTRAL TOC2 OP
FlexLogic Entry 126	OR(2)
FlexLogic Entry 127	= 51-51N (VO28)
FlexLogic Entry 128	PHASE IOC1 OP C
FlexLogic Entry 129	NEUTRAL IOC1 OP
FlexLogic Entry 130	OR(2)
FlexLogic Entry 131	= 50-50N (VO29)
FlexLogic Entry 132	PH DIST Z2 OP
FlexLogic Entry 133	GND DIST Z2 OP
FlexLogic Entry 134	OR(2)
FlexLogic Entry 135	RX RANCAGUA On(H8c)
FlexLogic Entry 136	AND(2)
FlexLogic Entry 137	PH DIST Z1 OP
FlexLogic Entry 138	GND DIST Z1 OP
FlexLogic Entry 139	OR(2)
FlexLogic Entry 140	OR(2)
FlexLogic Entry 141	= Partida 79 (VO30)
FlexLogic Entry 142	FALLA RELE On (VO21)
FlexLogic Entry 143	SELECTOR 1 POS 1
FlexLogic Entry 144	OR(2)
FlexLogic Entry 145	= Control 79S2 (VO31)
FlexLogic Entry 146	NEG SEQ DIR OC1 REV
FlexLogic Entry 147	SRC1 VT FUSE FAIL OP
FlexLogic Entry 148	NOT
FlexLogic Entry 149	AND(2)
FlexLogic Entry 150	= BL-NTCO (VO7)
FlexLogic Entry 151	NEUTRAL IOC1 OP
FlexLogic Entry 152	NEUTRAL TOC1 OP
FlexLogic Entry 153	OR(2)
FlexLogic Entry 154	NTRL DIR OC1 FWD
FlexLogic Entry 155	AND(2)
FlexLogic Entry 156	= 67N (VO32)
FlexLogic Entry 157	NEUTRAL TOC1 OP
FlexLogic Entry 158	SRC1 VT FUSE FAIL OP
FlexLogic Entry 159	AND(2)
FlexLogic Entry 160	PHASE TOC1 OP
FlexLogic Entry 161	OR(2)
FlexLogic Entry 162	= 51-51N (VO33)
FlexLogic Entry 163	NEUTRAL IOC1 OP
FlexLogic Entry 164	SRC1 VT FUSE FAIL OP
FlexLogic Entry 165	AND(2)
FlexLogic Entry 166	PHASE IOC1 OP
FlexLogic Entry 167	OR(2)
FlexLogic Entry 168	= 50-50N (VO34)
FlexLogic Entry 169	CHANGE GRP On(W2a)
FlexLogic Entry 170	NOT
FlexLogic Entry 171	86B -154 KV On(W2c)
FlexLogic Entry 172	AND(2)
FlexLogic Entry 173	= PC_OPEN_OK (VO38)
FlexLogic Entry 174	86B -154 KV On(W2c)
FlexLogic Entry 175	NOT
FlexLogic Entry 176	CHANGE GRP On(W2a)
FlexLogic Entry 177	AND(2)
FlexLogic Entry 178	= PC_CLOSE_OK (VO42)
FlexLogic Entry 179	CHANGE GRP On(W2a)
FlexLogic Entry 180	86B -154 KV On(W2c)
FlexLogic Entry 181	AND(2)
FlexLogic Entry 182	CHANGE GRP On(W2a)
FlexLogic Entry 183	NOT
FlexLogic Entry 184	86B -154 KV On(W2c)
FlexLogic Entry 185	NOT

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TEXT COLOR

FLEXLOGIC EQUATION EDITOR (continued from last page)

FlexLogic Entry 186	AND(2)
FlexLogic Entry 187	OR(2)
FlexLogic Entry 188	= PCORTES_DBI (VO39)
FlexLogic Entry 189	PCORTES_DBI On (VO39)
FlexLogic Entry 190	SELECTOR 2 POS 2
FlexLogic Entry 191	SETTING GROUP ACT 1
FlexLogic Entry 192	AND(2)
FlexLogic Entry 193	AND(2)
FlexLogic Entry 194	PCORTES_DBI On (VO39)
FlexLogic Entry 195	NOT
FlexLogic Entry 196	PC_OPEN_OK On (VO38)
FlexLogic Entry 197	AND(2)
FlexLogic Entry 198	OR(2)
FlexLogic Entry 199	= SET_GROUP2 (VO40)
FlexLogic Entry 200	PCORTES_DBI On (VO39)
FlexLogic Entry 201	SELECTOR 2 POS 1
FlexLogic Entry 202	SETTING GROUP ACT 2
FlexLogic Entry 203	AND(2)
FlexLogic Entry 204	AND(2)
FlexLogic Entry 205	PCORTES_DBI On (VO39)
FlexLogic Entry 206	NOT
FlexLogic Entry 207	PC_CLOSE_OK On (VO42)
FlexLogic Entry 208	AND(2)
FlexLogic Entry 209	OR(2)
FlexLogic Entry 210	= RESET_GROUP1 (VO43)
FlexLogic Entry 211	PH DIST Z5 OP
FlexLogic Entry 212	PH DIST Z5 OP
FlexLogic Entry 213	OR(2)
FlexLogic Entry 214	= LED Z5 (VO35)
FlexLogic Entry 215	PH DIST Z4 OP
FlexLogic Entry 216	GND DIST Z4 OP
FlexLogic Entry 217	OR(2)
FlexLogic Entry 218	= OPERA ZONA 4 (VO9)
FlexLogic Entry 219	PH DIST Z5 OP
FlexLogic Entry 220	GND DIST Z5 OP
FlexLogic Entry 221	OR(2)
FlexLogic Entry 222	= OPERA Z5 (VO26)
FlexLogic Entry 223	RX ITAHUE On(W1a)
FlexLogic Entry 224	RX RANCAGUA On(H8c)
FlexLogic Entry 225	SETTING GROUP ACT 1
FlexLogic Entry 226	AND(3)
FlexLogic Entry 227	= RECEPCION 3T (VO36)
FlexLogic Entry 228	RX RANCAGUA On(H8c)
FlexLogic Entry 229	SETTING GROUP ACT 2
FlexLogic Entry 230	AND(2)
FlexLogic Entry 231	= RECEPCION 2T (VO37)
FlexLogic Entry 232	RECEPCION 3T On (VO36)
FlexLogic Entry 233	RECEPCION 2T On (VO37)
FlexLogic Entry 234	OR(2)
FlexLogic Entry 235	= RECEPCION (VO41)
FlexLogic Entry 236	HYBRID POTT TX1
FlexLogic Entry 237	SETTING GROUP ACT 1
FlexLogic Entry 238	AND(2)
FlexLogic Entry 239	POTT TX1
FlexLogic Entry 240	SETTING GROUP ACT 2
FlexLogic Entry 241	AND(2)
FlexLogic Entry 242	OR(2)
FlexLogic Entry 243	= Tx RANCAGUA (VO44)
FlexLogic Entry 244	HYBRID POTT TX1
FlexLogic Entry 245	SETTING GROUP ACT 1
FlexLogic Entry 246	AND(2)
FlexLogic Entry 247	= Tx ITAHUE (VO45)
FlexLogic Entry 248	BLQ Zonas PH On (VO1)
FlexLogic Entry 249	LOAD ENCHR OP
FlexLogic Entry 250	OR(2)
FlexLogic Entry 251	= BLOQ LOAD E (VO46)
FlexLogic Entry 252	CHANGE GRP Off(W2a)
FlexLogic Entry 253	TIMER 4
FlexLogic Entry 254	= CAMBIO G1-G2 (VO47)

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FLEXLOGIC EQUATION EDITOR (continued from last page)

FlexLogic Entry 255	52A1 (a) Off(H7a)
FlexLogic Entry 256	RECEPCION 2T On (VO37)
FlexLogic Entry 257	AND(2)
FlexLogic Entry 258	= ECHO COND 2T (VO48)
FlexLogic Entry 259	52A1 (a) Off(H7a)
FlexLogic Entry 260	RECEPCION 3T On (VO36)
FlexLogic Entry 261	AND(2)
FlexLogic Entry 262	= ECHO COND 3T (VO49)
FlexLogic Entry 263	POTT OP
FlexLogic Entry 264	SETTING GROUP ACT 2
FlexLogic Entry 265	AND(2)
FlexLogic Entry 266	= POTT OP 2T (VO50)
FlexLogic Entry 267	END

FLEXLOGIC TIMERS

Timer 1: Type	millisecond
Timer 1: Pickup Delay	0
Timer 1: Dropout Delay	0
Timer 2: Type	millisecond
Timer 2: Pickup Delay	0
Timer 2: Dropout Delay	0
Timer 3: Type	millisecond
Timer 3: Pickup Delay	0
Timer 3: Dropout Delay	0
Timer 4: Type	second
Timer 4: Pickup Delay	2
Timer 4: Dropout Delay	2

GROUPED ELEMENTS

GROUP 1

LINE PICKUP [GROUP 1]

Function	Enabled
Signal Source	LINEA (SRC 1)
Phase IOC Line Pickup	1.882 pu
UV Pickup	0.800 pu
Line End Open Pickup Delay	0.200 s
Line End Open Reset Delay	0.200 s
OV Pickup Delay	0.200 s
Autoreclose Coordination Bypass	Enabled
Autoreclose Coordination Pickup Delay	0.045 s
Autoreclose Coordination Reset Delay	0.005 s
Terminal Open	BREAKER 1 OPEN
AR Accelerate	OFF
Block	OFF
Target	Self-reset
Events	Enabled

DISTANCE

DISTANCE [GROUP 1]

Source	LINEA (SRC 1)
Memory Duration	10 cycles
Force Self-Polar	OFF
Force Mem-Polar	OFF

PHASE DISTANCE [GROUP 1]

PHASE DISTANCE Z1: Function	Enabled
PHASE DISTANCE Z1: Direction	Forward
PHASE DISTANCE Z1: Shape	Quad
PHASE DISTANCE Z1: Xfmr Vol Connection	None
PHASE DISTANCE Z1: Xfmr Curr Connection	None
PHASE DISTANCE Z1: Reach	1.86 ohms
PHASE DISTANCE Z1: RCA	90 deg
PHASE DISTANCE Z1: Rev Reach	0.02 ohms
PHASE DISTANCE Z1: Rev Reach RCA	79 deg
PHASE DISTANCE Z1: Comp Limit	90 deg
PHASE DISTANCE Z1: DIR RCA	49 deg
PHASE DISTANCE Z1: DIR Comp Limit	71 deg
PHASE DISTANCE Z1: Quad Right Blinder	1.86 ohms
PHASE DISTANCE Z1: Quad Right Blinder RCA	79 deg

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PHASE DISTANCE [GROUP 1] (continued from last page)

PHASE DISTANCE Z1: Quad Left Blinder	1.86 ohms
PHASE DISTANCE Z1: Quad Left Blinder RCA	79 deg
PHASE DISTANCE Z1: Supervision	0.100 pu
PHASE DISTANCE Z1: Volt Level	0.000 pu
PHASE DISTANCE Z1: Delay	0.000 s
PHASE DISTANCE Z1: Block	BLQ Zonas PH On (VO1)
PHASE DISTANCE Z1: Target	Self-reset
PHASE DISTANCE Z1: Events	Enabled
PHASE DISTANCE Z2: Function	Enabled
PHASE DISTANCE Z2: Direction	Forward
PHASE DISTANCE Z2: Shape	Quad
PHASE DISTANCE Z2: Xfmr Vol Connection	None
PHASE DISTANCE Z2: Xfmr Curr Connection	None
PHASE DISTANCE Z2: Reach	8.50 ohms
PHASE DISTANCE Z2: RCA	90 deg
PHASE DISTANCE Z2: Rev Reach	0.02 ohms
PHASE DISTANCE Z2: Rev Reach RCA	79 deg
PHASE DISTANCE Z2: Comp Limit	90 deg
PHASE DISTANCE Z2: DIR RCA	49 deg
PHASE DISTANCE Z2: DIR Comp Limit	71 deg
PHASE DISTANCE Z2: Quad Right Blinder	8.00 ohms
PHASE DISTANCE Z2: Quad Right Blinder RCA	79 deg
PHASE DISTANCE Z2: Quad Left Blinder	8.00 ohms
PHASE DISTANCE Z2: Quad Left Blinder RCA	79 deg
PHASE DISTANCE Z2: Supervision	0.100 pu
PHASE DISTANCE Z2: Volt Level	0.000 pu
PHASE DISTANCE Z2: Delay	65.535 s
PHASE DISTANCE Z2: Block	BLQ Zonas PH On (VO1)
PHASE DISTANCE Z2: Target	Self-reset
PHASE DISTANCE Z2: Events	Enabled
PHASE DISTANCE Z3: Function	Enabled
PHASE DISTANCE Z3: Direction	Forward
PHASE DISTANCE Z3: Shape	Quad
PHASE DISTANCE Z3: Xfmr Vol Connection	None
PHASE DISTANCE Z3: Xfmr Curr Connection	None
PHASE DISTANCE Z3: Reach	4.26 ohms
PHASE DISTANCE Z3: RCA	90 deg
PHASE DISTANCE Z3: Rev Reach	0.02 ohms
PHASE DISTANCE Z3: Rev Reach RCA	79 deg
PHASE DISTANCE Z3: Comp Limit	90 deg
PHASE DISTANCE Z3: DIR RCA	49 deg
PHASE DISTANCE Z3: DIR Comp Limit	71 deg
PHASE DISTANCE Z3: Quad Right Blinder	4.26 ohms
PHASE DISTANCE Z3: Quad Right Blinder RCA	79 deg
PHASE DISTANCE Z3: Quad Left Blinder	4.26 ohms
PHASE DISTANCE Z3: Quad Left Blinder RCA	79 deg
PHASE DISTANCE Z3: Supervision	0.100 pu
PHASE DISTANCE Z3: Volt Level	0.000 pu
PHASE DISTANCE Z3: Delay	0.600 s
PHASE DISTANCE Z3: Block	BLQ Zonas PH On (VO1)
PHASE DISTANCE Z3: Target	Self-reset
PHASE DISTANCE Z3: Events	Enabled
PHASE DISTANCE Z4: Function	Enabled
PHASE DISTANCE Z4: Direction	Reverse
PHASE DISTANCE Z4: Shape	Quad
PHASE DISTANCE Z4: Xfmr Vol Connection	None
PHASE DISTANCE Z4: Xfmr Curr Connection	None
PHASE DISTANCE Z4: Reach	6.00 ohms
PHASE DISTANCE Z4: RCA	90 deg
PHASE DISTANCE Z4: Rev Reach	0.02 ohms
PHASE DISTANCE Z4: Rev Reach RCA	79 deg
PHASE DISTANCE Z4: Comp Limit	90 deg
PHASE DISTANCE Z4: DIR RCA	49 deg
PHASE DISTANCE Z4: DIR Comp Limit	71 deg
PHASE DISTANCE Z4: Quad Right Blinder	6.00 ohms
PHASE DISTANCE Z4: Quad Right Blinder RCA	79 deg
PHASE DISTANCE Z4: Quad Left Blinder	6.00 ohms
PHASE DISTANCE Z4: Quad Left Blinder RCA	79 deg
PHASE DISTANCE Z4: Supervision	0.100 pu

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DESCRIPTION: (NONE)
TEXT COLOR

PHASE DISTANCE [GROUP 1] (continued from last page)

PHASE DISTANCE Z4: Volt Level	0.000 pu
PHASE DISTANCE Z4: Delay	2.500 s
PHASE DISTANCE Z4: Block	BLQ Zonas PH On (VO1)
PHASE DISTANCE Z4: Target	Self-reset
PHASE DISTANCE Z4: Events	Enabled
PHASE DISTANCE Z5: Function	Enabled
PHASE DISTANCE Z5: Direction	Forward
PHASE DISTANCE Z5: Shape	Quad
PHASE DISTANCE Z5: Xfmr Vol Connection	None
PHASE DISTANCE Z5: Xfmr Curr Connection	None
PHASE DISTANCE Z5: Reach	6.50 ohms
PHASE DISTANCE Z5: RCA	90 deg
PHASE DISTANCE Z5: Rev Reach	0.02 ohms
PHASE DISTANCE Z5: Rev Reach RCA	79 deg
PHASE DISTANCE Z5: Comp Limit	90 deg
PHASE DISTANCE Z5: DIR RCA	49 deg
PHASE DISTANCE Z5: DIR Comp Limit	71 deg
PHASE DISTANCE Z5: Quad Right Blinder	6.50 ohms
PHASE DISTANCE Z5: Quad Right Blinder RCA	79 deg
PHASE DISTANCE Z5: Quad Left Blinder	6.50 ohms
PHASE DISTANCE Z5: Quad Left Blinder RCA	79 deg
PHASE DISTANCE Z5: Supervision	0.100 pu
PHASE DISTANCE Z5: Volt Level	0.000 pu
PHASE DISTANCE Z5: Delay	1.500 s
PHASE DISTANCE Z5: Block	BLQ Zonas PH On (VO1)
PHASE DISTANCE Z5: Target	Self-reset
PHASE DISTANCE Z5: Events	Enabled

GROUND DISTANCE [GROUP 1]

GROUND DISTANCE Z1: Function	Enabled
GROUND DISTANCE Z1: Direction	Forward
GROUND DISTANCE Z1: Shape	Quad
GROUND DISTANCE Z1: Z0/Z1 Mag	3.43
GROUND DISTANCE Z1: Z0/Z1 Ang	2 deg
GROUND DISTANCE Z1: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z1: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z1: Reach	1.86 ohms
GROUND DISTANCE Z1: RCA	90 deg
GROUND DISTANCE Z1: Rev Reach	0.02 ohms
GROUND DISTANCE Z1: Rev Reach RCA	79 deg
GROUND DISTANCE Z1: POL Current	Zero-seq
GROUND DISTANCE Z1: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z1: Comp Limit	90 deg
GROUND DISTANCE Z1: DIR RCA	49 deg
GROUND DISTANCE Z1: DIR Comp Limit	71 deg
GROUND DISTANCE Z1: Quad Right Blinder	1.86 ohms
GROUND DISTANCE Z1: Quad Right Blinder RCA	79 deg
GROUND DISTANCE Z1: Quad Left Blinder	1.86 ohms
GROUND DISTANCE Z1: Quad Left Blinder RCA	79 deg
GROUND DISTANCE Z1: Supervision	0.100 pu
GROUND DISTANCE Z1: Volt Level	0.000 pu
GROUND DISTANCE Z1: Delay	0.000 s
GROUND DISTANCE Z1: Block	SRC1 VT FUSE FAIL OP
GROUND DISTANCE Z1: Target	Self-reset
GROUND DISTANCE Z1: Events	Enabled
GROUND DISTANCE Z2: Function	Enabled
GROUND DISTANCE Z2: Direction	Forward
GROUND DISTANCE Z2: Shape	Quad
GROUND DISTANCE Z2: Z0/Z1 Mag	3.43
GROUND DISTANCE Z2: Z0/Z1 Ang	2 deg
GROUND DISTANCE Z2: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z2: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z2: Reach	8.50 ohms
GROUND DISTANCE Z2: RCA	90 deg
GROUND DISTANCE Z2: Rev Reach	0.02 ohms
GROUND DISTANCE Z2: Rev Reach RCA	79 deg
GROUND DISTANCE Z2: POL Current	Zero-seq
GROUND DISTANCE Z2: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z2: Comp Limit	90 deg

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DEVICE DEFINITION
FILES
ORDER CODE: D60-G00-HCH-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

GROUND DISTANCE [GROUP 1] (continued from last page)

GROUND DISTANCE Z2: DIR RCA	49 deg
GROUND DISTANCE Z2: DIR Comp Limit	71 deg
GROUND DISTANCE Z2: Quad Right Blinder	8.00 ohms
GROUND DISTANCE Z2: Quad Right Blinder RCA	79 deg
GROUND DISTANCE Z2: Quad Left Blinder	8.00 ohms
GROUND DISTANCE Z2: Quad Left Blinder RCA	79 deg
GROUND DISTANCE Z2: Supervision	0.100 pu
GROUND DISTANCE Z2: Volt Level	0.000 pu
GROUND DISTANCE Z2: Delay	65.535 s
GROUND DISTANCE Z2: Block	SRC1 VT FUSE FAIL OP
GROUND DISTANCE Z2: Target	Self-reset
GROUND DISTANCE Z2: Events	Enabled
GROUND DISTANCE Z3: Function	Enabled
GROUND DISTANCE Z3: Direction	Forward
GROUND DISTANCE Z3: Shape	Quad
GROUND DISTANCE Z3: Z0/Z1 Mag	3.43
GROUND DISTANCE Z3: Z0/Z1 Ang	2 deg
GROUND DISTANCE Z3: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z3: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z3: Reach	4.26 ohms
GROUND DISTANCE Z3: RCA	90 deg
GROUND DISTANCE Z3: Rev Reach	0.02 ohms
GROUND DISTANCE Z3: Rev Reach RCA	79 deg
GROUND DISTANCE Z3: POL Current	Zero-seq
GROUND DISTANCE Z3: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z3: Comp Limit	90 deg
GROUND DISTANCE Z3: DIR RCA	49 deg
GROUND DISTANCE Z3: DIR Comp Limit	71 deg
GROUND DISTANCE Z3: Quad Right Blinder	4.26 ohms
GROUND DISTANCE Z3: Quad Right Blinder RCA	79 deg
GROUND DISTANCE Z3: Quad Left Blinder	4.26 ohms
GROUND DISTANCE Z3: Quad Left Blinder RCA	79 deg
GROUND DISTANCE Z3: Supervision	0.100 pu
GROUND DISTANCE Z3: Volt Level	0.000 pu
GROUND DISTANCE Z3: Delay	0.600 s
GROUND DISTANCE Z3: Block	SRC1 VT FUSE FAIL OP
GROUND DISTANCE Z3: Target	Self-reset
GROUND DISTANCE Z3: Events	Enabled
GROUND DISTANCE Z4: Function	Enabled
GROUND DISTANCE Z4: Direction	Reverse
GROUND DISTANCE Z4: Shape	Quad
GROUND DISTANCE Z4: Z0/Z1 Mag	3.43
GROUND DISTANCE Z4: Z0/Z1 Ang	2 deg
GROUND DISTANCE Z4: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z4: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z4: Reach	6.00 ohms
GROUND DISTANCE Z4: RCA	90 deg
GROUND DISTANCE Z4: Rev Reach	0.02 ohms
GROUND DISTANCE Z4: Rev Reach RCA	79 deg
GROUND DISTANCE Z4: POL Current	Zero-seq
GROUND DISTANCE Z4: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z4: Comp Limit	90 deg
GROUND DISTANCE Z4: DIR RCA	49 deg
GROUND DISTANCE Z4: DIR Comp Limit	71 deg
GROUND DISTANCE Z4: Quad Right Blinder	6.00 ohms
GROUND DISTANCE Z4: Quad Right Blinder RCA	79 deg
GROUND DISTANCE Z4: Quad Left Blinder	6.00 ohms
GROUND DISTANCE Z4: Quad Left Blinder RCA	79 deg
GROUND DISTANCE Z4: Supervision	0.100 pu
GROUND DISTANCE Z4: Volt Level	0.000 pu
GROUND DISTANCE Z4: Delay	2.500 s
GROUND DISTANCE Z4: Block	SRC1 VT FUSE FAIL OP
GROUND DISTANCE Z4: Target	Self-reset
GROUND DISTANCE Z4: Events	Enabled
GROUND DISTANCE Z5: Function	Enabled
GROUND DISTANCE Z5: Direction	Forward
GROUND DISTANCE Z5: Shape	Quad
GROUND DISTANCE Z5: Z0/Z1 Mag	3.43
GROUND DISTANCE Z5: Z0/Z1 Ang	2 deg

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DEVICE DEFINITION
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ORDER CODE: D60-G00-HCH-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

GROUND DISTANCE [GROUP 1] (continued from last page)

GROUND DISTANCE Z5: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z5: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z5: Reach	6.50 ohms
GROUND DISTANCE Z5: RCA	90 deg
GROUND DISTANCE Z5: Rev Reach	0.02 ohms
GROUND DISTANCE Z5: Rev Reach RCA	79 deg
GROUND DISTANCE Z5: POL Current	Zero-seq
GROUND DISTANCE Z5: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z5: Comp Limit	90 deg
GROUND DISTANCE Z5: DIR RCA	49 deg
GROUND DISTANCE Z5: DIR Comp Limit	71 deg
GROUND DISTANCE Z5: Quad Right Blinder	13.00 ohms
GROUND DISTANCE Z5: Quad Right Blinder RCA	79 deg
GROUND DISTANCE Z5: Quad Left Blinder	13.00 ohms
GROUND DISTANCE Z5: Quad Left Blinder RCA	79 deg
GROUND DISTANCE Z5: Supervision	0.100 pu
GROUND DISTANCE Z5: Volt Level	0.000 pu
GROUND DISTANCE Z5: Delay	1.500 s
GROUND DISTANCE Z5: Block	SRC1 VT FUSE FAIL OP
GROUND DISTANCE Z5: Target	Self-reset
GROUND DISTANCE Z5: Events	Enabled

POWER SWING DETECT [GROUP 1]

Function	Enabled
Source	LINEA (SRC 1)
Shape	Quad Shape
Mode	Two Step
Supv	0.200 pu
Fwd Reach	17.50 ohms
Quad Fwd Mid	18.20 ohms
Quad Fwd Out	18.20 ohms
Fwd Rca	79 deg
Rev Reach	8.00 ohms
Quad Rev Mid	8.70 ohms
Quad Rev Out	8.70 ohms
Rev Rca	79 deg
Outer Limit Angle	120 deg
Middle Limit Angle	72 deg
Inner Limit Angle	72 deg
Outer Rgt Bld	15.20 ohms
Outer Lft Bld	12.20 ohms
Midle Rgt Bld	100.00 ohms
Midle Lft Bld	100.00 ohms
Inner Rgt Bld	14.50 ohms
Inner Lft Bld	11.50 ohms
Delay 1 Pickup	0.002 s
Delay 1 Reset	0.050 s
Delay 2 Pickup	0.017 s
Delay 3 Pickup	0.009 s
Delay 4 Pickup	0.017 s
Seal-In Delay	0.400 s
Trip Mode	Early
Block	NEUTRAL TOC1 PKP
Target	Self-reset
Event	Disabled

LOAD ENCROACHMENT [GROUP 1]

Function	Enabled
Source	LINEA (SRC 1)
Min Volt	0.800 pu
Reach	9.14 ohms
Angle	35 deg
Pickup Delay	0.000 s
Reset Delay	0.000 s
Block	OFF
Target	Self-reset
Events	Enabled

PHASE CURRENT

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ORDER CODE: D60-G00-HCH-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

PHASE TOC [GROUP 1]

PHASE TOC1: Function	Enabled
PHASE TOC1: Signal Source	LINEA (SRC 1)
PHASE TOC1: Input	Phasor
PHASE TOC1: Pickup	1.200 pu
PHASE TOC1: Curve	IEC Curve A
PHASE TOC1: TD Multiplier	0.10
PHASE TOC1: Reset	Instantaneous
PHASE TOC1: Voltage Restraint	Disabled
PHASE TOC1: Block A	PH DIR1 BLK
PHASE TOC1: Block B	PH DIR1 BLK
PHASE TOC1: Block C	PH DIR1 BLK
PHASE TOC1: Target	Self-reset
PHASE TOC1: Events	Enabled

PHASE DIRECTIONAL [GROUP 1]

PHASE DIR1: Function	Enabled
PHASE DIR1: Source	LINEA (SRC 1)
PHASE DIR1: Block	OFF
PHASE DIR1: ECA	45 deg
PHASE DIR1: Pol V Threshold	0.700 pu
PHASE DIR1: Block when V Mem Exp	No
PHASE DIR1: Target	Self-reset
PHASE DIR1: Events	Enabled

NEUTRAL CURRENT

NEUTRAL TOC [GROUP 1]

NEUTRAL TOC1: Function	Enabled
NEUTRAL TOC1: Source	LINEA (SRC 1)
NEUTRAL TOC1: Input	Phasor
NEUTRAL TOC1: Pickup	0.082 pu
NEUTRAL TOC1: Curve	IEC Curve A
NEUTRAL TOC1: TD Multiplier	0.30
NEUTRAL TOC1: Reset	Instantaneous
NEUTRAL TOC1: Block	BL-NTCO On (VO7)
NEUTRAL TOC1: Target	Self-reset
NEUTRAL TOC1: Events	Enabled

NEGATIVE SEQUENCE CURRENT

NEGATIVE SEQUENCE DIRECTIONAL OC [GROUP 1]

NEGATIVE SEQ DIR OC1: Function	Enabled
NEGATIVE SEQ DIR OC1: Source	LINEA (SRC 1)
NEGATIVE SEQ DIR OC1: Offset	0.00 ohms
NEGATIVE SEQ DIR OC1: Type	Neg Sequence
NEGATIVE SEQ DIR OC1: POS SEQ Restraint	0.000
NEGATIVE SEQ DIR OC1: Forward ECA	78 ° Lag
NEGATIVE SEQ DIR OC1: Forward Limit Angle	80 deg
NEGATIVE SEQ DIR OC1: Forward Pickup	0.08 pu
NEGATIVE SEQ DIR OC1: Reverse Limit Angle	80 deg
NEGATIVE SEQ DIR OC1: Reverse Pickup	0.08 pu
NEGATIVE SEQ DIR OC1: Block	SRC1 VT FUSE FAIL OP
NEGATIVE SEQ DIR OC1: Target	Self-reset
NEGATIVE SEQ DIR OC1: Events	Enabled

BREAKER FAILURE [GROUP 1]

BF1: Function	Enabled
BF1: Mode	3-Pole
BF1: Source	LINEA (SRC 1)
BF1: Current Supervision	Yes
BF1: Use Seal-In	Yes
BF1: Three Pole Initiate	TRIP 3-POLE
BF1: Block	OFF
BF1: Phase Current Supv Pickup	1.200 pu
BF1: Neutral Current Supv Pickup	0.082 pu
BF1: Use Timer 1	Yes
BF1: Timer 1 Pickup Delay	0.200 s
BF1: Use Timer 2	No
BF1: Timer 2 Pickup Delay	0.200 s
BF1: Use Timer 3	No
BF1: Timer 3 Pickup Delay	0.000 s

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VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

BREAKER FAILURE [GROUP 1] (continued from last page)

BF1: Breaker Pos1 Phase A/3P	52A1 (a) On(H7a)
BF1: Breaker Pos2 Phase A/3P	OFF
BF1: Breaker Test On	ON
BF1: Phase Current HiSet Pickup	1.200 pu
BF1: Neutral Current HiSet Pickup	0.082 pu
BF1: Phase Current LoSet Pickup	1.200 pu
BF1: Neutral Current LoSet Pickup	0.082 pu
BF1: LoSet Time Delay	0.000 s
BF1: Trip Dropout Delay	0.000 s
BF1: Target	Self-reset
BF1: Events	Enabled
BF1: Phase A Initiate	OFF
BF1: Phase B Initiate	OFF
BF1: Phase C Initiate	OFF
BF1: Breaker Pos1 Phase B	OFF
BF1: Breaker Pos1 Phase C	OFF
BF1: Breaker Pos2 Phase B	OFF
BF1: Breaker Pos2 Phase C	OFF

GROUP 2

LINE PICKUP [GROUP 2]

Function	Enabled
Signal Source	LINEA (SRC 1)
Phase IOC Line Pickup	2.500 pu
UV Pickup	0.800 pu
Line End Open Pickup Delay	0.200 s
Line End Open Reset Delay	0.200 s
OV Pickup Delay	0.200 s
Autoreclose Coordination Bypass	Disabled
Autoreclose Coordination Pickup Delay	0.045 s
Autoreclose Coordination Reset Delay	0.005 s
Terminal Open	BREAKER 1 OPEN
AR Accelerate	OFF
Block	OFF
Target	Self-reset
Events	Enabled

DISTANCE

DISTANCE [GROUP 2]

Source	LINEA (SRC 1)
Memory Duration	10 cycles
Force Self-Polar	OFF
Force Mem-Polar	OFF

PHASE DISTANCE [GROUP 2]

PHASE DISTANCE Z1: Function	Enabled
PHASE DISTANCE Z1: Direction	Forward
PHASE DISTANCE Z1: Shape	Quad
PHASE DISTANCE Z1: Xfmr Vol Connection	None
PHASE DISTANCE Z1: Xfmr Curr Connection	None
PHASE DISTANCE Z1: Reach	1.72 ohms
PHASE DISTANCE Z1: RCA	90 deg
PHASE DISTANCE Z1: Rev Reach	0.02 ohms
PHASE DISTANCE Z1: Rev Reach RCA	79 deg
PHASE DISTANCE Z1: Comp Limit	90 deg
PHASE DISTANCE Z1: DIR RCA	45 deg
PHASE DISTANCE Z1: DIR Comp Limit	79 deg
PHASE DISTANCE Z1: Quad Right Blinder	1.72 ohms
PHASE DISTANCE Z1: Quad Right Blinder RCA	79 deg
PHASE DISTANCE Z1: Quad Left Blinder	10.00 ohms
PHASE DISTANCE Z1: Quad Left Blinder RCA	79 deg
PHASE DISTANCE Z1: Supervision	0.200 pu
PHASE DISTANCE Z1: Volt Level	0.000 pu
PHASE DISTANCE Z1: Delay	0.000 s
PHASE DISTANCE Z1: Block	BLQ Zonas PH On (VO1)
PHASE DISTANCE Z1: Target	Self-reset
PHASE DISTANCE Z1: Events	Enabled
PHASE DISTANCE Z2: Function	Enabled
PHASE DISTANCE Z2: Direction	Forward

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ORDER CODE: D60-G00-HCH-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

PHASE DISTANCE [GROUP 2] (continued from last page)

PHASE DISTANCE Z2: Shape	Quad
PHASE DISTANCE Z2: Xfmr Vol Connection	None
PHASE DISTANCE Z2: Xfmr Curr Connection	None
PHASE DISTANCE Z2: Reach	3.60 ohms
PHASE DISTANCE Z2: RCA	90 deg
PHASE DISTANCE Z2: Rev Reach	0.02 ohms
PHASE DISTANCE Z2: Rev Reach RCA	79 deg
PHASE DISTANCE Z2: Comp Limit	90 deg
PHASE DISTANCE Z2: DIR RCA	45 deg
PHASE DISTANCE Z2: DIR Comp Limit	79 deg
PHASE DISTANCE Z2: Quad Right Blinder	3.60 ohms
PHASE DISTANCE Z2: Quad Right Blinder RCA	79 deg
PHASE DISTANCE Z2: Quad Left Blinder	10.00 ohms
PHASE DISTANCE Z2: Quad Left Blinder RCA	79 deg
PHASE DISTANCE Z2: Supervision	0.200 pu
PHASE DISTANCE Z2: Volt Level	0.000 pu
PHASE DISTANCE Z2: Delay	0.400 s
PHASE DISTANCE Z2: Block	BLQ Zonas PH On (VO1)
PHASE DISTANCE Z2: Target	Self-reset
PHASE DISTANCE Z2: Events	Enabled
PHASE DISTANCE Z3: Function	Enabled
PHASE DISTANCE Z3: Direction	Forward
PHASE DISTANCE Z3: Shape	Quad
PHASE DISTANCE Z3: Xfmr Vol Connection	None
PHASE DISTANCE Z3: Xfmr Curr Connection	None
PHASE DISTANCE Z3: Reach	4.70 ohms
PHASE DISTANCE Z3: RCA	90 deg
PHASE DISTANCE Z3: Rev Reach	4.70 ohms
PHASE DISTANCE Z3: Rev Reach RCA	79 deg
PHASE DISTANCE Z3: Comp Limit	90 deg
PHASE DISTANCE Z3: DIR RCA	45 deg
PHASE DISTANCE Z3: DIR Comp Limit	79 deg
PHASE DISTANCE Z3: Quad Right Blinder	4.70 ohms
PHASE DISTANCE Z3: Quad Right Blinder RCA	79 deg
PHASE DISTANCE Z3: Quad Left Blinder	10.00 ohms
PHASE DISTANCE Z3: Quad Left Blinder RCA	79 deg
PHASE DISTANCE Z3: Supervision	0.200 pu
PHASE DISTANCE Z3: Volt Level	0.000 pu
PHASE DISTANCE Z3: Delay	2.000 s
PHASE DISTANCE Z3: Block	BLQ Zonas PH On (VO1)
PHASE DISTANCE Z3: Target	Self-reset
PHASE DISTANCE Z3: Events	Enabled
PHASE DISTANCE Z4: Function	Enabled
PHASE DISTANCE Z4: Direction	Reverse
PHASE DISTANCE Z4: Shape	Quad
PHASE DISTANCE Z4: Xfmr Vol Connection	None
PHASE DISTANCE Z4: Xfmr Curr Connection	None
PHASE DISTANCE Z4: Reach	0.80 ohms
PHASE DISTANCE Z4: RCA	90 deg
PHASE DISTANCE Z4: Rev Reach	0.80 ohms
PHASE DISTANCE Z4: Rev Reach RCA	79 deg
PHASE DISTANCE Z4: Comp Limit	90 deg
PHASE DISTANCE Z4: DIR RCA	45 deg
PHASE DISTANCE Z4: DIR Comp Limit	79 deg
PHASE DISTANCE Z4: Quad Right Blinder	0.80 ohms
PHASE DISTANCE Z4: Quad Right Blinder RCA	79 deg
PHASE DISTANCE Z4: Quad Left Blinder	10.00 ohms
PHASE DISTANCE Z4: Quad Left Blinder RCA	79 deg
PHASE DISTANCE Z4: Supervision	0.200 pu
PHASE DISTANCE Z4: Volt Level	0.000 pu
PHASE DISTANCE Z4: Delay	2.000 s
PHASE DISTANCE Z4: Block	BLQ Zonas PH On (VO1)
PHASE DISTANCE Z4: Target	Self-reset
PHASE DISTANCE Z4: Events	Enabled

GROUND DISTANCE [GROUP 2]

GROUND DISTANCE Z1: Function	Enabled
GROUND DISTANCE Z1: Direction	Forward
GROUND DISTANCE Z1: Shape	Quad

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FILES
ORDER CODE: D60-G00-HCH-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

GROUND DISTANCE [GROUP 2] (continued from last page)	
GROUND DISTANCE Z1: Z0/Z1 Mag	3.36
GROUND DISTANCE Z1: Z0/Z1 Ang	1 deg
GROUND DISTANCE Z1: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z1: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z1: Reach	1.72 ohms
GROUND DISTANCE Z1: RCA	90 deg
GROUND DISTANCE Z1: Rev Reach	1.72 ohms
GROUND DISTANCE Z1: Rev Reach RCA	79 deg
GROUND DISTANCE Z1: POL Current	Zero-seq
GROUND DISTANCE Z1: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z1: Comp Limit	90 deg
GROUND DISTANCE Z1: DIR RCA	45 deg
GROUND DISTANCE Z1: DIR Comp Limit	79 deg
GROUND DISTANCE Z1: Quad Right Blinder	3.44 ohms
GROUND DISTANCE Z1: Quad Right Blinder RCA	79 deg
GROUND DISTANCE Z1: Quad Left Blinder	3.44 ohms
GROUND DISTANCE Z1: Quad Left Blinder RCA	79 deg
GROUND DISTANCE Z1: Supervision	0.200 pu
GROUND DISTANCE Z1: Volt Level	0.000 pu
GROUND DISTANCE Z1: Delay	0.000 s
GROUND DISTANCE Z1: Block	SRC1 VT FUSE FAIL OP
GROUND DISTANCE Z1: Target	Self-reset
GROUND DISTANCE Z1: Events	Enabled
GROUND DISTANCE Z2: Function	Enabled
GROUND DISTANCE Z2: Direction	Forward
GROUND DISTANCE Z2: Shape	Quad
GROUND DISTANCE Z2: Z0/Z1 Mag	3.36
GROUND DISTANCE Z2: Z0/Z1 Ang	1 deg
GROUND DISTANCE Z2: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z2: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z2: Reach	3.60 ohms
GROUND DISTANCE Z2: RCA	90 deg
GROUND DISTANCE Z2: Rev Reach	3.60 ohms
GROUND DISTANCE Z2: Rev Reach RCA	79 deg
GROUND DISTANCE Z2: POL Current	Zero-seq
GROUND DISTANCE Z2: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z2: Comp Limit	90 deg
GROUND DISTANCE Z2: DIR RCA	45 deg
GROUND DISTANCE Z2: DIR Comp Limit	79 deg
GROUND DISTANCE Z2: Quad Right Blinder	7.20 ohms
GROUND DISTANCE Z2: Quad Right Blinder RCA	79 deg
GROUND DISTANCE Z2: Quad Left Blinder	7.20 ohms
GROUND DISTANCE Z2: Quad Left Blinder RCA	79 deg
GROUND DISTANCE Z2: Supervision	0.100 pu
GROUND DISTANCE Z2: Volt Level	0.000 pu
GROUND DISTANCE Z2: Delay	0.400 s
GROUND DISTANCE Z2: Block	SRC1 VT FUSE FAIL OP
GROUND DISTANCE Z2: Target	Self-reset
GROUND DISTANCE Z2: Events	Enabled
GROUND DISTANCE Z3: Function	Enabled
GROUND DISTANCE Z3: Direction	Forward
GROUND DISTANCE Z3: Shape	Quad
GROUND DISTANCE Z3: Z0/Z1 Mag	3.36
GROUND DISTANCE Z3: Z0/Z1 Ang	1 deg
GROUND DISTANCE Z3: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z3: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z3: Reach	4.70 ohms
GROUND DISTANCE Z3: RCA	90 deg
GROUND DISTANCE Z3: Rev Reach	4.70 ohms
GROUND DISTANCE Z3: Rev Reach RCA	79 deg
GROUND DISTANCE Z3: POL Current	Zero-seq
GROUND DISTANCE Z3: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z3: Comp Limit	90 deg
GROUND DISTANCE Z3: DIR RCA	45 deg
GROUND DISTANCE Z3: DIR Comp Limit	79 deg
GROUND DISTANCE Z3: Quad Right Blinder	9.40 ohms
GROUND DISTANCE Z3: Quad Right Blinder RCA	79 deg
GROUND DISTANCE Z3: Quad Left Blinder	9.40 ohms
GROUND DISTANCE Z3: Quad Left Blinder RCA	79 deg

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ORDER CODE: D60-G00-HCH-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

GROUND DISTANCE [GROUP 2] (continued from last page)

GROUND DISTANCE Z3: Supervision	0.100 pu
GROUND DISTANCE Z3: Volt Level	0.000 pu
GROUND DISTANCE Z3: Delay	2.000 s
GROUND DISTANCE Z3: Block	SRC1 VT FUSE FAIL OP
GROUND DISTANCE Z3: Target	Self-reset
GROUND DISTANCE Z3: Events	Enabled
GROUND DISTANCE Z4: Function	Enabled
GROUND DISTANCE Z4: Direction	Reverse
GROUND DISTANCE Z4: Shape	Quad
GROUND DISTANCE Z4: Z0/Z1 Mag	3.36
GROUND DISTANCE Z4: Z0/Z1 Ang	1 deg
GROUND DISTANCE Z4: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z4: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z4: Reach	0.80 ohms
GROUND DISTANCE Z4: RCA	90 deg
GROUND DISTANCE Z4: Rev Reach	0.80 ohms
GROUND DISTANCE Z4: Rev Reach RCA	79 deg
GROUND DISTANCE Z4: POL Current	Zero-seq
GROUND DISTANCE Z4: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z4: Comp Limit	90 deg
GROUND DISTANCE Z4: DIR RCA	45 deg
GROUND DISTANCE Z4: DIR Comp Limit	79 deg
GROUND DISTANCE Z4: Quad Right Blinder	1.03 ohms
GROUND DISTANCE Z4: Quad Right Blinder RCA	79 deg
GROUND DISTANCE Z4: Quad Left Blinder	1.03 ohms
GROUND DISTANCE Z4: Quad Left Blinder RCA	79 deg
GROUND DISTANCE Z4: Supervision	0.100 pu
GROUND DISTANCE Z4: Volt Level	0.000 pu
GROUND DISTANCE Z4: Delay	2.000 s
GROUND DISTANCE Z4: Block	SRC1 VT FUSE FAIL OP
GROUND DISTANCE Z4: Target	Self-reset
GROUND DISTANCE Z4: Events	Enabled

POWER SWING DETECT [GROUP 2]

Function	Enabled
Source	LINEA (SRC 1)
Shape	Quad Shape
Mode	Two Step
Supv	0.200 pu
Fwd Reach	7.00 ohms
Quad Fwd Mid	60.00 ohms
Quad Fwd Out	9.00 ohms
Fwd Rca	79 deg
Rev Reach	3.50 ohms
Quad Rev Mid	60.00 ohms
Quad Rev Out	7.00 ohms
Rev Rca	90 deg
Outer Limit Angle	120 deg
Middle Limit Angle	90 deg
Inner Limit Angle	79 deg
Outer Rgt Bld	9.70 ohms
Outer Lft Bld	8.00 ohms
Midle Rgt Bld	100.00 ohms
Midle Lft Bld	100.00 ohms
Inner Rgt Bld	5.20 ohms
Inner Lft Bld	6.00 ohms
Delay 1 Pickup	0.001 s
Delay 1 Reset	0.050 s
Delay 2 Pickup	0.017 s
Delay 3 Pickup	0.009 s
Delay 4 Pickup	0.017 s
Seal-In Delay	0.400 s
Trip Mode	Delayed
Block	NEUTRAL TOC1 PKP
Target	Self-reset
Event	Disabled

PHASE CURRENT
PHASE TOC [GROUP 2]

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ORDER CODE: D60-G00-HCH-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

PHASE TOC [GROUP 2] (continued from last page)

PHASE TOC1: Function	Enabled
PHASE TOC1: Signal Source	LINEA (SRC 1)
PHASE TOC1: Input	Phasor
PHASE TOC1: Pickup	1.200 pu
PHASE TOC1: Curve	IEC Curve A
PHASE TOC1: TD Multiplier	0.21
PHASE TOC1: Reset	Instantaneous
PHASE TOC1: Voltage Restraint	Disabled
PHASE TOC1: Block A	PH DIR1 BLK
PHASE TOC1: Block B	PH DIR1 BLK
PHASE TOC1: Block C	PH DIR1 BLK
PHASE TOC1: Target	Self-reset
PHASE TOC1: Events	Enabled

PHASE IOC [GROUP 2]

PHASE IOC1: Function	Enabled
PHASE IOC1: Source	LINEA (SRC 1)
PHASE IOC1: Pickup	4.400 pu
PHASE IOC1: Delay	0.01 s
PHASE IOC1: Reset Delay	0.00 s
PHASE IOC1: Block A	SRC1 VT FUSE FAIL DPO
PHASE IOC1: Block B	SRC1 VT FUSE FAIL DPO
PHASE IOC1: Block C	SRC1 VT FUSE FAIL DPO
PHASE IOC1: Target	Self-reset
PHASE IOC1: Events	Enabled

NEUTRAL CURRENT

NEUTRAL TOC [GROUP 2]

NEUTRAL TOC1: Function	Enabled
NEUTRAL TOC1: Source	LINEA (SRC 1)
NEUTRAL TOC1: Input	Phasor
NEUTRAL TOC1: Pickup	0.480 pu
NEUTRAL TOC1: Curve	IEC Curve A
NEUTRAL TOC1: TD Multiplier	0.13
NEUTRAL TOC1: Reset	Instantaneous
NEUTRAL TOC1: Block	BL-NTCO On (VO7)
NEUTRAL TOC1: Target	Self-reset
NEUTRAL TOC1: Events	Enabled

NEUTRAL IOC [GROUP 2]

NEUTRAL IOC1: Function	Enabled
NEUTRAL IOC1: Source	LINEA (SRC 1)
NEUTRAL IOC1: Pickup	2.200 pu
NEUTRAL IOC1: Delay	0.03 s
NEUTRAL IOC1: Reset Delay	0.00 s
NEUTRAL IOC1: Block	BL-NTCO On (VO7)
NEUTRAL IOC1: Target	Self-reset
NEUTRAL IOC1: Events	Enabled

NEGATIVE SEQUENCE CURRENT

NEGATIVE SEQUENCE DIRECTIONAL OC [GROUP 2]

NEGATIVE SEQ DIR OC1: Function	Enabled
NEGATIVE SEQ DIR OC1: Source	LINEA (SRC 1)
NEGATIVE SEQ DIR OC1: Offset	0.00 ohms
NEGATIVE SEQ DIR OC1: Type	Neg Sequence
NEGATIVE SEQ DIR OC1: POS SEQ Restraint	0.000
NEGATIVE SEQ DIR OC1: Forward ECA	81 ° Lag
NEGATIVE SEQ DIR OC1: Forward Limit Angle	80 deg
NEGATIVE SEQ DIR OC1: Forward Pickup	0.10 pu
NEGATIVE SEQ DIR OC1: Reverse Limit Angle	81 deg
NEGATIVE SEQ DIR OC1: Reverse Pickup	0.10 pu
NEGATIVE SEQ DIR OC1: Block	SRC1 VT FUSE FAIL OP
NEGATIVE SEQ DIR OC1: Target	Self-reset
NEGATIVE SEQ DIR OC1: Events	Enabled

BREAKER FAILURE [GROUP 2]

BF1: Function	Enabled
BF1: Mode	3-Pole
BF1: Source	LINEA (SRC 1)

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VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

BREAKER FAILURE [GROUP 2] (continued from last page)

BF1: Current Supervision	Yes
BF1: Use Seal-In	No
BF1: Three Pole Initiate	TRIP 3-POLE
BF1: Block	OFF
BF1: Phase Current Supv Pickup	1.200 pu
BF1: Neutral Current Supv Pickup	0.480 pu
BF1: Use Timer 1	Yes
BF1: Timer 1 Pickup Delay	0.200 s
BF1: Use Timer 2	No
BF1: Timer 2 Pickup Delay	0.200 s
BF1: Use Timer 3	No
BF1: Timer 3 Pickup Delay	0.000 s
BF1: Breaker Pos1 Phase A/3P	52A1 (a) On(H7a)
BF1: Breaker Pos2 Phase A/3P	OFF
BF1: Breaker Test On	OFF
BF1: Phase Current HiSet Pickup	1.200 pu
BF1: Neutral Current HiSet Pickup	0.480 pu
BF1: Phase Current LoSet Pickup	1.200 pu
BF1: Neutral Current LoSet Pickup	0.480 pu
BF1: LoSet Time Delay	0.000 s
BF1: Trip Dropout Delay	0.000 s
BF1: Target	Self-reset
BF1: Events	Enabled
BF1: Phase A Initiate	OFF
BF1: Phase B Initiate	OFF
BF1: Phase C Initiate	OFF
BF1: Breaker Pos1 Phase B	OFF
BF1: Breaker Pos1 Phase C	OFF
BF1: Breaker Pos2 Phase B	OFF
BF1: Breaker Pos2 Phase C	OFF

GROUP 3

LINE PICKUP [GROUP 3]

Function	Enabled
Signal Source	LINEA (SRC 1)
Phase IOC Line Pickup	2.500 pu
UV Pickup	0.800 pu
Line End Open Pickup Delay	0.200 s
Line End Open Reset Delay	0.200 s
OV Pickup Delay	0.200 s
Autoreclose Coordination Bypass	Disabled
Autoreclose Coordination Pickup Delay	0.045 s
Autoreclose Coordination Reset Delay	0.005 s
Terminal Open	BREAKER 1 OPEN
AR Accelerate	OFF
Block	OFF
Target	Self-reset
Events	Enabled

DISTANCE

DISTANCE [GROUP 3]

Source	LINEA (SRC 1)
Memory Duration	10 cycles
Force Self-Polar	OFF
Force Mem-Polar	OFF

PHASE DISTANCE [GROUP 3]

PHASE DISTANCE Z1: Function	Enabled
PHASE DISTANCE Z1: Direction	Forward
PHASE DISTANCE Z1: Shape	Quad
PHASE DISTANCE Z1: Xfmr Vol Connection	None
PHASE DISTANCE Z1: Xfmr Curr Connection	None
PHASE DISTANCE Z1: Reach	1.72 ohms
PHASE DISTANCE Z1: RCA	90 deg
PHASE DISTANCE Z1: Rev Reach	1.72 ohms
PHASE DISTANCE Z1: Rev Reach RCA	79 deg
PHASE DISTANCE Z1: Comp Limit	90 deg
PHASE DISTANCE Z1: DIR RCA	45 deg
PHASE DISTANCE Z1: DIR Comp Limit	79 deg

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DESCRIPTION: (NONE)
TEXT COLOR

PHASE DISTANCE [GROUP 3] (continued from last page)

PHASE DISTANCE Z1: Quad Right Blinder	1.72 ohms
PHASE DISTANCE Z1: Quad Right Blinder RCA	79 deg
PHASE DISTANCE Z1: Quad Left Blinder	1.72 ohms
PHASE DISTANCE Z1: Quad Left Blinder RCA	79 deg
PHASE DISTANCE Z1: Supervision	0.200 pu
PHASE DISTANCE Z1: Volt Level	0.000 pu
PHASE DISTANCE Z1: Delay	0.000 s
PHASE DISTANCE Z1: Block	BLQ Zonas PH On (VO1)
PHASE DISTANCE Z1: Target	Self-reset
PHASE DISTANCE Z1: Events	Enabled
PHASE DISTANCE Z2: Function	Enabled
PHASE DISTANCE Z2: Direction	Forward
PHASE DISTANCE Z2: Shape	Quad
PHASE DISTANCE Z2: Xfmr Vol Connection	None
PHASE DISTANCE Z2: Xfmr Curr Connection	None
PHASE DISTANCE Z2: Reach	3.60 ohms
PHASE DISTANCE Z2: RCA	90 deg
PHASE DISTANCE Z2: Rev Reach	3.60 ohms
PHASE DISTANCE Z2: Rev Reach RCA	79 deg
PHASE DISTANCE Z2: Comp Limit	90 deg
PHASE DISTANCE Z2: DIR RCA	45 deg
PHASE DISTANCE Z2: DIR Comp Limit	79 deg
PHASE DISTANCE Z2: Quad Right Blinder	3.60 ohms
PHASE DISTANCE Z2: Quad Right Blinder RCA	79 deg
PHASE DISTANCE Z2: Quad Left Blinder	3.60 ohms
PHASE DISTANCE Z2: Quad Left Blinder RCA	79 deg
PHASE DISTANCE Z2: Supervision	0.200 pu
PHASE DISTANCE Z2: Volt Level	0.000 pu
PHASE DISTANCE Z2: Delay	0.600 s
PHASE DISTANCE Z2: Block	BLQ Zonas PH On (VO1)
PHASE DISTANCE Z2: Target	Self-reset
PHASE DISTANCE Z2: Events	Enabled
PHASE DISTANCE Z3: Function	Enabled
PHASE DISTANCE Z3: Direction	Forward
PHASE DISTANCE Z3: Shape	Quad
PHASE DISTANCE Z3: Xfmr Vol Connection	None
PHASE DISTANCE Z3: Xfmr Curr Connection	None
PHASE DISTANCE Z3: Reach	5.20 ohms
PHASE DISTANCE Z3: RCA	90 deg
PHASE DISTANCE Z3: Rev Reach	5.20 ohms
PHASE DISTANCE Z3: Rev Reach RCA	79 deg
PHASE DISTANCE Z3: Comp Limit	90 deg
PHASE DISTANCE Z3: DIR RCA	45 deg
PHASE DISTANCE Z3: DIR Comp Limit	79 deg
PHASE DISTANCE Z3: Quad Right Blinder	4.70 ohms
PHASE DISTANCE Z3: Quad Right Blinder RCA	79 deg
PHASE DISTANCE Z3: Quad Left Blinder	4.70 ohms
PHASE DISTANCE Z3: Quad Left Blinder RCA	79 deg
PHASE DISTANCE Z3: Supervision	0.200 pu
PHASE DISTANCE Z3: Volt Level	0.000 pu
PHASE DISTANCE Z3: Delay	2.000 s
PHASE DISTANCE Z3: Block	BLQ Zonas PH On (VO1)
PHASE DISTANCE Z3: Target	Self-reset
PHASE DISTANCE Z3: Events	Enabled
PHASE DISTANCE Z4: Function	Enabled
PHASE DISTANCE Z4: Direction	Reverse
PHASE DISTANCE Z4: Shape	Quad
PHASE DISTANCE Z4: Xfmr Vol Connection	None
PHASE DISTANCE Z4: Xfmr Curr Connection	None
PHASE DISTANCE Z4: Reach	4.00 ohms
PHASE DISTANCE Z4: RCA	90 deg
PHASE DISTANCE Z4: Rev Reach	4.00 ohms
PHASE DISTANCE Z4: Rev Reach RCA	79 deg
PHASE DISTANCE Z4: Comp Limit	90 deg
PHASE DISTANCE Z4: DIR RCA	45 deg
PHASE DISTANCE Z4: DIR Comp Limit	79 deg
PHASE DISTANCE Z4: Quad Right Blinder	4.00 ohms
PHASE DISTANCE Z4: Quad Right Blinder RCA	79 deg
PHASE DISTANCE Z4: Quad Left Blinder	4.00 ohms

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DESCRIPTION: (NONE)
TEXT COLOR

PHASE DISTANCE [GROUP 3] (continued from last page)	
PHASE DISTANCE Z4: Quad Left Blinder RCA	79 deg
PHASE DISTANCE Z4: Supervision	0.200 pu
PHASE DISTANCE Z4: Volt Level	0.000 pu
PHASE DISTANCE Z4: Delay	2.000 s
PHASE DISTANCE Z4: Block	BLQ Zonas PH On (VO1)
PHASE DISTANCE Z4: Target	Self-reset
PHASE DISTANCE Z4: Events	Enabled

GROUND DISTANCE [GROUP 3]	
GROUND DISTANCE Z1: Function	Enabled
GROUND DISTANCE Z1: Direction	Forward
GROUND DISTANCE Z1: Shape	Quad
GROUND DISTANCE Z1: Z0/Z1 Mag	3.36
GROUND DISTANCE Z1: Z0/Z1 Ang	1 deg
GROUND DISTANCE Z1: Z0M/Z1 Mag	2.25
GROUND DISTANCE Z1: Z0M/Z1 Ang	2 deg
GROUND DISTANCE Z1: Reach	1.72 ohms
GROUND DISTANCE Z1: RCA	90 deg
GROUND DISTANCE Z1: Rev Reach	1.72 ohms
GROUND DISTANCE Z1: Rev Reach RCA	79 deg
GROUND DISTANCE Z1: POL Current	Zero-seq
GROUND DISTANCE Z1: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z1: Comp Limit	90 deg
GROUND DISTANCE Z1: DIR RCA	45 deg
GROUND DISTANCE Z1: DIR Comp Limit	79 deg
GROUND DISTANCE Z1: Quad Right Blinder	3.44 ohms
GROUND DISTANCE Z1: Quad Right Blinder RCA	79 deg
GROUND DISTANCE Z1: Quad Left Blinder	3.44 ohms
GROUND DISTANCE Z1: Quad Left Blinder RCA	79 deg
GROUND DISTANCE Z1: Supervision	0.200 pu
GROUND DISTANCE Z1: Volt Level	0.000 pu
GROUND DISTANCE Z1: Delay	0.000 s
GROUND DISTANCE Z1: Block	SRC1 VT FUSE FAIL OP
GROUND DISTANCE Z1: Target	Self-reset
GROUND DISTANCE Z1: Events	Enabled
GROUND DISTANCE Z2: Function	Enabled
GROUND DISTANCE Z2: Direction	Forward
GROUND DISTANCE Z2: Shape	Quad
GROUND DISTANCE Z2: Z0/Z1 Mag	3.36
GROUND DISTANCE Z2: Z0/Z1 Ang	1 deg
GROUND DISTANCE Z2: Z0M/Z1 Mag	2.25
GROUND DISTANCE Z2: Z0M/Z1 Ang	2 deg
GROUND DISTANCE Z2: Reach	3.60 ohms
GROUND DISTANCE Z2: RCA	90 deg
GROUND DISTANCE Z2: Rev Reach	3.60 ohms
GROUND DISTANCE Z2: Rev Reach RCA	79 deg
GROUND DISTANCE Z2: POL Current	Zero-seq
GROUND DISTANCE Z2: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z2: Comp Limit	90 deg
GROUND DISTANCE Z2: DIR RCA	45 deg
GROUND DISTANCE Z2: DIR Comp Limit	79 deg
GROUND DISTANCE Z2: Quad Right Blinder	7.20 ohms
GROUND DISTANCE Z2: Quad Right Blinder RCA	79 deg
GROUND DISTANCE Z2: Quad Left Blinder	7.20 ohms
GROUND DISTANCE Z2: Quad Left Blinder RCA	79 deg
GROUND DISTANCE Z2: Supervision	0.100 pu
GROUND DISTANCE Z2: Volt Level	0.000 pu
GROUND DISTANCE Z2: Delay	0.600 s
GROUND DISTANCE Z2: Block	SRC1 VT FUSE FAIL OP
GROUND DISTANCE Z2: Target	Self-reset
GROUND DISTANCE Z2: Events	Enabled
GROUND DISTANCE Z3: Function	Enabled
GROUND DISTANCE Z3: Direction	Forward
GROUND DISTANCE Z3: Shape	Quad
GROUND DISTANCE Z3: Z0/Z1 Mag	3.36
GROUND DISTANCE Z3: Z0/Z1 Ang	1 deg
GROUND DISTANCE Z3: Z0M/Z1 Mag	2.25
GROUND DISTANCE Z3: Z0M/Z1 Ang	2 deg
GROUND DISTANCE Z3: Reach	5.20 ohms

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DESCRIPTION: (NONE)
TEXT COLOR

GROUND DISTANCE [GROUP 3] (continued from last page)

GROUND DISTANCE Z3: RCA	90 deg
GROUND DISTANCE Z3: Rev Reach	5.20 ohms
GROUND DISTANCE Z3: Rev Reach RCA	79 deg
GROUND DISTANCE Z3: POL Current	Zero-seq
GROUND DISTANCE Z3: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z3: Comp Limit	90 deg
GROUND DISTANCE Z3: DIR RCA	45 deg
GROUND DISTANCE Z3: DIR Comp Limit	79 deg
GROUND DISTANCE Z3: Quad Right Blinder	7.20 ohms
GROUND DISTANCE Z3: Quad Right Blinder RCA	79 deg
GROUND DISTANCE Z3: Quad Left Blinder	7.20 ohms
GROUND DISTANCE Z3: Quad Left Blinder RCA	79 deg
GROUND DISTANCE Z3: Supervision	0.100 pu
GROUND DISTANCE Z3: Volt Level	0.000 pu
GROUND DISTANCE Z3: Delay	2.000 s
GROUND DISTANCE Z3: Block	SRC1 VT FUSE FAIL OP
GROUND DISTANCE Z3: Target	Self-reset
GROUND DISTANCE Z3: Events	Enabled
GROUND DISTANCE Z4: Function	Enabled
GROUND DISTANCE Z4: Direction	Reverse
GROUND DISTANCE Z4: Shape	Quad
GROUND DISTANCE Z4: Z0/Z1 Mag	3.36
GROUND DISTANCE Z4: Z0/Z1 Ang	1 deg
GROUND DISTANCE Z4: Z0M/Z1 Mag	2.25
GROUND DISTANCE Z4: Z0M/Z1 Ang	2 deg
GROUND DISTANCE Z4: Reach	4.00 ohms
GROUND DISTANCE Z4: RCA	90 deg
GROUND DISTANCE Z4: Rev Reach	4.00 ohms
GROUND DISTANCE Z4: Rev Reach RCA	79 deg
GROUND DISTANCE Z4: POL Current	Zero-seq
GROUND DISTANCE Z4: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z4: Comp Limit	90 deg
GROUND DISTANCE Z4: DIR RCA	45 deg
GROUND DISTANCE Z4: DIR Comp Limit	79 deg
GROUND DISTANCE Z4: Quad Right Blinder	8.00 ohms
GROUND DISTANCE Z4: Quad Right Blinder RCA	79 deg
GROUND DISTANCE Z4: Quad Left Blinder	0.10 ohms
GROUND DISTANCE Z4: Quad Left Blinder RCA	79 deg
GROUND DISTANCE Z4: Supervision	0.100 pu
GROUND DISTANCE Z4: Volt Level	0.000 pu
GROUND DISTANCE Z4: Delay	2.000 s
GROUND DISTANCE Z4: Block	SRC1 VT FUSE FAIL OP
GROUND DISTANCE Z4: Target	Self-reset
GROUND DISTANCE Z4: Events	Enabled

POWER SWING DETECT [GROUP 3]

Function	Enabled
Source	LINEA (SRC 1)
Shape	Quad Shape
Mode	Two Step
Supv	0.200 pu
Fwd Reach	7.00 ohms
Quad Fwd Mid	60.00 ohms
Quad Fwd Out	9.00 ohms
Fwd Rca	79 deg
Rev Reach	3.50 ohms
Quad Rev Mid	60.00 ohms
Quad Rev Out	7.00 ohms
Rev Rca	90 deg
Outer Limit Angle	120 deg
Middle Limit Angle	90 deg
Inner Limit Angle	79 deg
Outer Rgt Bld	9.70 ohms
Outer Lft Bld	8.00 ohms
Midle Rgt Bld	100.00 ohms
Midle Lft Bld	100.00 ohms
Inner Rgt Bld	5.20 ohms
Inner Lft Bld	6.00 ohms
Delay 1 Pickup	0.001 s

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DESCRIPTION: (NONE)
TEXT COLOR

POWER SWING DETECT [GROUP 3] (continued from last page)

Delay 1 Reset	0.050 s
Delay 2 Pickup	0.017 s
Delay 3 Pickup	0.009 s
Delay 4 Pickup	0.017 s
Seal-In Delay	0.400 s
Trip Mode	Delayed
Block	NEUTRAL TOC1 PKP
Target	Self-reset
Event	Disabled

PHASE CURRENT

PHASE TOC [GROUP 3]

PHASE TOC1: Function	Enabled
PHASE TOC1: Signal Source	LINEA (SRC 1)
PHASE TOC1: Input	Phasor
PHASE TOC1: Pickup	1.200 pu
PHASE TOC1: Curve	IEC Curve A
PHASE TOC1: TD Multiplier	0.21
PHASE TOC1: Reset	Instantaneous
PHASE TOC1: Voltage Restraint	Disabled
PHASE TOC1: Block A	PH DIR1 BLK
PHASE TOC1: Block B	PH DIR1 BLK
PHASE TOC1: Block C	PH DIR1 BLK
PHASE TOC1: Target	Self-reset
PHASE TOC1: Events	Enabled

PHASE IOC [GROUP 3]

PHASE IOC1: Function	Enabled
PHASE IOC1: Source	LINEA (SRC 1)
PHASE IOC1: Pickup	4.400 pu
PHASE IOC1: Delay	0.01 s
PHASE IOC1: Reset Delay	0.00 s
PHASE IOC1: Block A	SRC1 VT FUSE FAIL DPO
PHASE IOC1: Block B	SRC1 VT FUSE FAIL DPO
PHASE IOC1: Block C	SRC1 VT FUSE FAIL DPO
PHASE IOC1: Target	Self-reset
PHASE IOC1: Events	Enabled

NEUTRAL CURRENT

NEUTRAL TOC [GROUP 3]

NEUTRAL TOC1: Function	Enabled
NEUTRAL TOC1: Source	LINEA (SRC 1)
NEUTRAL TOC1: Input	Phasor
NEUTRAL TOC1: Pickup	0.480 pu
NEUTRAL TOC1: Curve	IEC Curve A
NEUTRAL TOC1: TD Multiplier	0.13
NEUTRAL TOC1: Reset	Instantaneous
NEUTRAL TOC1: Block	BL-NTCO On (VO7)
NEUTRAL TOC1: Target	Self-reset
NEUTRAL TOC1: Events	Enabled

NEUTRAL IOC [GROUP 3]

NEUTRAL IOC1: Function	Enabled
NEUTRAL IOC1: Source	LINEA (SRC 1)
NEUTRAL IOC1: Pickup	2.200 pu
NEUTRAL IOC1: Delay	0.03 s
NEUTRAL IOC1: Reset Delay	0.00 s
NEUTRAL IOC1: Block	BL-NTCO On (VO7)
NEUTRAL IOC1: Target	Self-reset
NEUTRAL IOC1: Events	Enabled

NEGATIVE SEQUENCE CURRENT

NEGATIVE SEQUENCE DIRECTIONAL OC [GROUP 3]

NEGATIVE SEQ DIR OC1: Function	Enabled
NEGATIVE SEQ DIR OC1: Source	LINEA (SRC 1)
NEGATIVE SEQ DIR OC1: Offset	0.00 ohms
NEGATIVE SEQ DIR OC1: Type	Neg Sequence
NEGATIVE SEQ DIR OC1: POS SEQ Restraint	0.000
NEGATIVE SEQ DIR OC1: Forward ECA	81 ° Lag

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VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

NEGATIVE SEQUENCE DIRECTIONAL OC [GROUP 3] (continued from last page)

NEGATIVE SEQ DIR OC1: Forward Limit Angle	80 deg
NEGATIVE SEQ DIR OC1: Forward Pickup	0.10 pu
NEGATIVE SEQ DIR OC1: Reverse Limit Angle	81 deg
NEGATIVE SEQ DIR OC1: Reverse Pickup	0.10 pu
NEGATIVE SEQ DIR OC1: Block	SRC1 VT FUSE FAIL OP
NEGATIVE SEQ DIR OC1: Target	Self-reset
NEGATIVE SEQ DIR OC1: Events	Enabled

BREAKER FAILURE [GROUP 3]

BF1: Function	Enabled
BF1: Mode	3-Pole
BF1: Source	LINEA (SRC 1)
BF1: Current Supervision	Yes
BF1: Use Seal-In	No
BF1: Three Pole Initiate	TRIP 3-POLE
BF1: Block	OFF
BF1: Phase Current Supv Pickup	1.200 pu
BF1: Neutral Current Supv Pickup	0.480 pu
BF1: Use Timer 1	Yes
BF1: Timer 1 Pickup Delay	0.200 s
BF1: Use Timer 2	No
BF1: Timer 2 Pickup Delay	0.200 s
BF1: Use Timer 3	No
BF1: Timer 3 Pickup Delay	0.000 s
BF1: Breaker Pos1 Phase A/3P	52A1 (a) On(H7a)
BF1: Breaker Pos2 Phase A/3P	OFF
BF1: Breaker Test On	OFF
BF1: Phase Current HiSet Pickup	1.200 pu
BF1: Neutral Current HiSet Pickup	0.480 pu
BF1: Phase Current LoSet Pickup	1.200 pu
BF1: Neutral Current LoSet Pickup	0.480 pu
BF1: LoSet Time Delay	0.000 s
BF1: Trip Dropout Delay	0.000 s
BF1: Target	Self-reset
BF1: Events	Enabled
BF1: Phase A Initiate	OFF
BF1: Phase B Initiate	OFF
BF1: Phase C Initiate	OFF
BF1: Breaker Pos1 Phase B	OFF
BF1: Breaker Pos1 Phase C	OFF
BF1: Breaker Pos2 Phase B	OFF
BF1: Breaker Pos2 Phase C	OFF

CONTROL ELEMENTS

SETTING GROUPS

Function	Enabled
Block	OFF
Group 2 Activate On	OFF
Group 3 Activate On	ON
Group 4 Activate On	OFF
Group 5 Activate On	OFF
Group 6 Activate On	OFF
Group 1 Name	C/TELEPROT
Group 2 Name	S/TELEPROT
Group 3 Name	C/TELEPROT
Group 4 Name	
Group 5 Name	
Group 6 Name	
Events	Enabled

SELECTOR SWITCHES

SELECTOR SWITCH 1: Function	Enabled
SELECTOR SWITCH 1: Full Range	2
SELECTOR SWITCH 1: Timeout	3.0 s
SELECTOR SWITCH 1: Step-Up	CONTROL PUSHBUTTON 1 ON
SELECTOR SWITCH 1: Step-Up Mode	Time-out
SELECTOR SWITCH 1: Acknowledge	OFF
SELECTOR SWITCH 1: 3Bit A0	OFF
SELECTOR SWITCH 1: 3Bit A1	OFF

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DESCRIPTION: (NONE)
TEXT COLOR

SELECTOR SWITCHES (continued from last page)

SELECTOR SWITCH 1: 3Bit A2	OFF
SELECTOR SWITCH 1: 3Bit Mode	Time-out
SELECTOR SWITCH 1: 3Bit Ack	OFF
SELECTOR SWITCH 1: Power-Up Mode	Restore
SELECTOR SWITCH 1: Targets	Self-reset
SELECTOR SWITCH 1: Events	Disabled
SELECTOR SWITCH 2: Function	Enabled
SELECTOR SWITCH 2: Full Range	2
SELECTOR SWITCH 2: Timeout	3.0 s
SELECTOR SWITCH 2: Step-Up	CONTROL PUSHBUTTON 2 ON
SELECTOR SWITCH 2: Step-Up Mode	Time-out
SELECTOR SWITCH 2: Acknowledge	OFF
SELECTOR SWITCH 2: 3Bit A0	OFF
SELECTOR SWITCH 2: 3Bit A1	OFF
SELECTOR SWITCH 2: 3Bit A2	OFF
SELECTOR SWITCH 2: 3Bit Mode	Time-out
SELECTOR SWITCH 2: 3Bit Ack	OFF
SELECTOR SWITCH 2: Power-Up Mode	Restore
SELECTOR SWITCH 2: Targets	Self-reset
SELECTOR SWITCH 2: Events	Enabled

TRIP OUTPUT

Trip Mode	3 Pole Only
Trip 3-Pole Input1	TRIP GRAL On (VO2)
Trip 3-Pole Input2	OFF
Trip 3-Pole Input3	OFF
Trip 3-Pole Input4	OFF
Trip 3-Pole Input5	OFF
Trip 3-Pole Input6	OFF
Trip 1-Pole Input1	OFF
Trip 1-Pole Input2	OFF
Trip 1-Pole Input3	OFF
Trip 1-Pole Input4	OFF
Trip 1-Pole Input5	OFF
Trip 1-Pole Input6	OFF
Trip Reclose Input1	OFF
Trip Reclose Input2	OFF
Trip Reclose Input3	OFF
Trip Reclose Input4	OFF
Trip Reclose Input5	OFF
Trip Reclose Input6	OFF
BKR Phase A Open	LINE PICKUP I<A
BKR Phase B Open	LINE PICKUP I<B
BKR Phase C Open	LINE PICKUP I<C
Trip Force 3-Pole	OFF
Trip Pilot Priority	0.000 s
Reverse Fault	OFF
Trip Delay On Evolving Faults	0.000 s
Trip Events	Enabled

MONITORING ELEMENTS

VT FUSE FAILURE

VT FUSE FAILURE 1: Function	Enabled
VT FUSE FAILURE 2: Function	Enabled

PILOT SCHEMES

1P POTT SCHEME

Function	Enabled
Permissive Echo	Disabled
Echo Condition	OFF
Rx Pickup Delay	0.000 s
Trans Block Pickup Delay	0.030 s
Trans Block Reset Delay	0.170 s
Echo Duration	0.100 s
Echo Lockout	0.250 s
Line End Open Pickup Delay	0.050 s
Seal-In Delay	0.000 s
Gnd Dir OC Fwd	OFF
Comm Bits	1

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ORDER CODE: D60-G00-HCH-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

1P POTT SCHEME (continued from last page)

Rx1	RECEPCION 2T On (VO37)
Rx2	OFF
Rx3	OFF
Rx4	OFF
Target	Self-reset
Event	Enabled

1P HYBRID POTT SCHEME

Function	Enabled
Permissive Echo	Disabled
Echo Condition	OFF
Weak Infeed	Disabled
W/I Condition	OFF
Rx Pickup Delay	0.000 s
Trans Block Pickup Delay	0.030 s
Trans Block Reset Delay	0.150 s
Echo Duration	0.100 s
Echo Lockout	0.250 s
Seal-In Delay	0.000 s
Gnd Dir OC Fwd	OFF
Gnd Dir OC Rev	BL-NTCO On (VO7)
No of Comm Bits	1
Rx1	RECEPCION 3T On (VO36)
Rx2	OFF
Rx3	OFF
Rx4	OFF
Target	Self-reset
Event	Enabled

INPUTS/OUTPUTS

CONTACT INPUTS

[H7A] Contact Input 1 ID	52A1 (a)
[H7A] Contact Input 1 Debounce Time	2.0 ms
[H7A] Contact Input 1 Events	Enabled
[H7C] Contact Input 2 ID	79 conectado
[H7C] Contact Input 2 Debounce Time	2.0 ms
[H7C] Contact Input 2 Events	Enabled
[H8A] Contact Input 3 ID	86B--> 50BF
[H8A] Contact Input 3 Debounce Time	2.0 ms
[H8A] Contact Input 3 Events	Enabled
[H8C] Contact Input 4 ID	RX RANCAGUA
[H8C] Contact Input 4 Debounce Time	2.0 ms
[H8C] Contact Input 4 Events	Enabled
[U7A] Contact Input 5 ID	FALLA RELE
[U7A] Contact Input 5 Debounce Time	2.0 ms
[U7A] Contact Input 5 Events	Disabled
[U7C] Contact Input 6 ID	Cont Ip 6
[U7C] Contact Input 6 Debounce Time	2.0 ms
[U7C] Contact Input 6 Events	Disabled
[U8A] Contact Input 7 ID	Cont Ip 7
[U8A] Contact Input 7 Debounce Time	2.0 ms
[U8A] Contact Input 7 Events	Disabled
[U8C] Contact Input 8 ID	Cont Ip 8
[U8C] Contact Input 8 Debounce Time	2.0 ms
[U8C] Contact Input 8 Events	Disabled
[W1A] Contact Input 9 ID	RX ITAHUE
[W1A] Contact Input 9 Debounce Time	2.0 ms
[W1A] Contact Input 9 Events	Enabled
[W1C] Contact Input 10 ID	80 SISTEMA 1
[W1C] Contact Input 10 Debounce Time	2.0 ms
[W1C] Contact Input 10 Events	Enabled
[W2A] Contact Input 11 ID	CHANGE GRP
[W2A] Contact Input 11 Debounce Time	2.0 ms
[W2A] Contact Input 11 Events	Enabled
[W2C] Contact Input 12 ID	86B -154 KV
[W2C] Contact Input 12 Debounce Time	2.0 ms
[W2C] Contact Input 12 Events	Enabled
[W3A] Contact Input 13 ID	Cont Ip 13
[W3A] Contact Input 13 Debounce Time	2.0 ms

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DEVICE DEFINITION
FILES
ORDER CODE: D60-G00-HCH-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

CONTACT INPUTS (continued from last page)

[W3A] Contact Input 13 Events	Disabled
[W3C] Contact Input 14 ID	Cont Ip 14
[W3C] Contact Input 14 Debounce Time	2.0 ms
[W3C] Contact Input 14 Events	Disabled
[W4A] Contact Input 15 ID	Cont Ip 15
[W4A] Contact Input 15 Debounce Time	2.0 ms
[W4A] Contact Input 15 Events	Disabled
[W4C] Contact Input 16 ID	Cont Ip 16
[W4C] Contact Input 16 Debounce Time	2.0 ms
[W4C] Contact Input 16 Events	Disabled
[W5A] Contact Input 17 ID	Cont Ip 17
[W5A] Contact Input 17 Debounce Time	2.0 ms
[W5A] Contact Input 17 Events	Disabled
[W5C] Contact Input 18 ID	Cont Ip 18
[W5C] Contact Input 18 Debounce Time	2.0 ms
[W5C] Contact Input 18 Events	Disabled
[W6A] Contact Input 19 ID	Cont Ip 19
[W6A] Contact Input 19 Debounce Time	2.0 ms
[W6A] Contact Input 19 Events	Disabled
[W6C] Contact Input 20 ID	Cont Ip 20
[W6C] Contact Input 20 Debounce Time	2.0 ms
[W6C] Contact Input 20 Events	Disabled
[W7A] Contact Input 21 ID	Cont Ip 21
[W7A] Contact Input 21 Debounce Time	2.0 ms
[W7A] Contact Input 21 Events	Disabled
[W7C] Contact Input 22 ID	Cont Ip 22
[W7C] Contact Input 22 Debounce Time	2.0 ms
[W7C] Contact Input 22 Events	Disabled
[W8A] Contact Input 23 ID	Cont Ip 23
[W8A] Contact Input 23 Debounce Time	2.0 ms
[W8A] Contact Input 23 Events	Disabled
[W8C] Contact Input 24 ID	Cont Ip 24
[W8C] Contact Input 24 Debounce Time	2.0 ms
[W8C] Contact Input 24 Events	Disabled

CONTACT INPUT THRESHOLDS

52A1 (a), 79 conectado, 86B--> 50BF, RX RANCAGUA(H7a, H7c, H8a, H8c)	84 Vdc
FALLA RELE, Cont Ip 6, Cont Ip 7, Cont Ip 8(U7a, U7c, U8a, U8c)	84 Vdc
RX ITAHUE, 80 SISTEMA 1, CHANGE GRP, 86B -154 KV(W1a, W1c, W2a, W2	84 Vdc
Cont Ip 13, Cont Ip 14, Cont Ip 15, Cont Ip 16(W3a, W3c, W4a, W4c)	84 Vdc
Cont Ip 17, Cont Ip 18, Cont Ip 19, Cont Ip 20(W5a, W5c, W6a, W6c)	84 Vdc
Cont Ip 21, Cont Ip 22, Cont Ip 23, Cont Ip 24(W7a, W7c, W8a, W8c)	84 Vdc

CONTACT OUTPUTS

[H1] Contact Output 1 ID	TRIP BD1
[H1] Contact Output 1 Operate	TRIP GRAL On (VO2)
[H1] Contact Output 1 Seal-In	OFF
[H1] Contact Output 1 Events	Enabled
[H2] Contact Output 2 ID	RETRIP 50BF
[H2] Contact Output 2 Operate	BKR FAIL 1 RETRIP
[H2] Contact Output 2 Seal-In	OFF
[H2] Contact Output 2 Events	Enabled
[H3] Contact Output 3 ID	50BF --> 86B
[H3] Contact Output 3 Operate	BKR FAIL 1 T1 OP
[H3] Contact Output 3 Seal-In	OFF
[H3] Contact Output 3 Events	Enabled
[H4] Contact Output 4 ID	OPERACION 79
[H4] Contact Output 4 Operate	ORD. CIERRE On (VO6)
[H4] Contact Output 4 Seal-In	OFF
[H4] Contact Output 4 Events	Enabled
[M1] Contact Output 7 ID	CONT 79 S2
[M1] Contact Output 7 Operate	SELECTOR 1 POS 1
[M1] Contact Output 7 Seal-In	OFF
[M1] Contact Output 7 Events	Enabled
[M2] Contact Output 8 ID	TX ITAHUE
[M2] Contact Output 8 Operate	Tx ITAHUE On (VO45)
[M2] Contact Output 8 Seal-In	OFF
[M2] Contact Output 8 Events	Enabled
[M3] Contact Output 9 ID	URT REC ACEL

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ORDER CODE: D60-G00-HCH-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

CONTACT OUTPUTS (continued from last page)

[M3] Contact Output 9 Operate	RECEPCION On (VO41)
[M3] Contact Output 9 Seal-In	OFF
[M3] Contact Output 9 Events	Enabled
[M4] Contact Output 10 ID	URT OPE Z1
[M4] Contact Output 10 Operate	OPERA ZONA 1 On (VO23)
[M4] Contact Output 10 Seal-In	OFF
[M4] Contact Output 10 Events	Enabled
[M5] Contact Output 11 ID	URT OPE Z4
[M5] Contact Output 11 Operate	OPERA ZONA 4 On (VO9)
[M5] Contact Output 11 Seal-In	OFF
[M5] Contact Output 11 Events	Enabled
[M6] Contact Output 12 ID	URT OPE Z5
[M6] Contact Output 12 Operate	OPERA Z5 On (VO26)
[M6] Contact Output 12 Seal-In	OFF
[M6] Contact Output 12 Events	Enabled
[M8] Contact Output 14 ID	PRUEBA D60
[M8] Contact Output 14 Operate	TRIP GRAL On (VO2)
[M8] Contact Output 14 Seal-In	OFF
[M8] Contact Output 14 Events	Enabled
[P1] Contact Output 15 ID	URT Z2 OPER
[P1] Contact Output 15 Operate	OPERA ZONA 2 On (VO24)
[P1] Contact Output 15 Seal-In	OFF
[P1] Contact Output 15 Events	Enabled
[P2] Contact Output 16 ID	URT Z3 OP
[P2] Contact Output 16 Operate	OPERA Z3 On (VO25)
[P2] Contact Output 16 Seal-In	OFF
[P2] Contact Output 16 Events	Enabled
[P3] Contact Output 17 ID	URT OPER 79
[P3] Contact Output 17 Operate	ORD. CIERRE On (VO6)
[P3] Contact Output 17 Seal-In	OFF
[P3] Contact Output 17 Events	Enabled
[P4] Contact Output 18 ID	URT SOTF OP
[P4] Contact Output 18 Operate	LINE PICKUP OP
[P4] Contact Output 18 Seal-In	OFF
[P4] Contact Output 18 Events	Enabled
[P5] Contact Output 19 ID	URT 50 BF OP
[P5] Contact Output 19 Operate	BKR FAIL 1 T2 OP
[P5] Contact Output 19 Seal-In	OFF
[P5] Contact Output 19 Events	Enabled
[P6] Contact Output 20 ID	URT TRIP S1
[P6] Contact Output 20 Operate	TRIP GRAL On (VO2)
[P6] Contact Output 20 Seal-In	OFF
[P6] Contact Output 20 Events	Enabled
[P7] Contact Output 21 ID	URT FA RELE
[P7] Contact Output 21 Operate	FALLA RELE On (VO21)
[P7] Contact Output 21 Seal-In	OFF
[P7] Contact Output 21 Events	Enabled
[P8] Contact Output 22 ID	TX RANCAGUA
[P8] Contact Output 22 Operate	Tx RANCAGUA On (VO44)
[P8] Contact Output 22 Seal-In	OFF
[P8] Contact Output 22 Events	Enabled
[U1] Contact Output 23 ID	80 SISTEMA 1
[U1] Contact Output 23 Operate	80 SISTEMA 1 On(W1c)
[U1] Contact Output 23 Seal-In	OFF
[U1] Contact Output 23 Events	Enabled

VIRTUAL OUTPUTS

Virtual Output 1 ID	BLQ Zonas PH
Virtual Output 1 Events	Enabled
Virtual Output 2 ID	TRIP GRAL
Virtual Output 2 Events	Enabled
Virtual Output 3 ID	OSCILOGRAFIA
Virtual Output 3 Events	Enabled
Virtual Output 4 ID	pkp Z1o z2
Virtual Output 4 Events	Enabled
Virtual Output 6 ID	ORD. CIERRE
Virtual Output 6 Events	Enabled
Virtual Output 7 ID	BL-NTCO
Virtual Output 7 Events	Enabled

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DEVICE DEFINITION
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ORDER CODE: D60-G00-HCH-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

VIRTUAL OUTPUTS (continued from last page)

Virtual Output 8 ID	POWER SWING
Virtual Output 8 Events	Enabled
Virtual Output 9 ID	OPERA ZONA 4
Virtual Output 9 Events	Enabled
Virtual Output 10 ID	RESET 79
Virtual Output 10 Events	Enabled
Virtual Output 11 ID	Tx OPLAT
Virtual Output 11 Events	Disabled
Virtual Output 12 ID	TX MMOO
Virtual Output 12 Events	Enabled
Virtual Output 13 ID	LED Z1
Virtual Output 13 Events	Enabled
Virtual Output 14 ID	LED Z2
Virtual Output 14 Events	Enabled
Virtual Output 15 ID	LED Z3
Virtual Output 15 Events	Enabled
Virtual Output 16 ID	LED Z4
Virtual Output 16 Events	Enabled
Virtual Output 17 ID	79 on
Virtual Output 17 Events	Enabled
Virtual Output 18 ID	79 off
Virtual Output 18 Events	Enabled
Virtual Output 19 ID	reset led
Virtual Output 19 Events	Enabled
Virtual Output 21 ID	FALLA RELE
Virtual Output 21 Events	Enabled
Virtual Output 22 ID	RECEP ACELER
Virtual Output 22 Events	Enabled
Virtual Output 23 ID	OPERA ZONA 1
Virtual Output 23 Events	Enabled
Virtual Output 24 ID	OPERA ZONA 2
Virtual Output 24 Events	Enabled
Virtual Output 25 ID	OPERA Z3
Virtual Output 25 Events	Enabled
Virtual Output 26 ID	OPERA Z5
Virtual Output 26 Events	Enabled
Virtual Output 27 ID	67-67N
Virtual Output 27 Events	Disabled
Virtual Output 28 ID	51-51N
Virtual Output 28 Events	Enabled
Virtual Output 29 ID	50-50N
Virtual Output 29 Events	Enabled
Virtual Output 30 ID	Partida 79
Virtual Output 30 Events	Enabled
Virtual Output 31 ID	Control 79S2
Virtual Output 31 Events	Enabled
Virtual Output 32 ID	67N
Virtual Output 32 Events	Enabled
Virtual Output 33 ID	51-51N
Virtual Output 33 Events	Enabled
Virtual Output 34 ID	50-50N
Virtual Output 34 Events	Enabled
Virtual Output 35 ID	LED Z5
Virtual Output 35 Events	Enabled
Virtual Output 36 ID	RECEPCION 3T
Virtual Output 36 Events	Enabled
Virtual Output 37 ID	RECEPCION 2T
Virtual Output 37 Events	Enabled
Virtual Output 38 ID	PC_OPEN_OK
Virtual Output 38 Events	Enabled
Virtual Output 39 ID	PCORTES_DBI
Virtual Output 39 Events	Enabled
Virtual Output 40 ID	SET_GROUP2
Virtual Output 40 Events	Enabled
Virtual Output 41 ID	RECEPCION
Virtual Output 41 Events	Enabled
Virtual Output 42 ID	PC_CLOSE_OK
Virtual Output 42 Events	Enabled
Virtual Output 43 ID	RESET_GROUP1

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DEVICE DEFINITION
FILES
ORDER CODE: D60-G00-HCH-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

VIRTUAL OUTPUTS (continued from last page)

Virtual Output 43 Events	Enabled
Virtual Output 44 ID	Tx RANCAGUA
Virtual Output 44 Events	Enabled
Virtual Output 45 ID	Tx ITAHUE
Virtual Output 45 Events	Enabled
Virtual Output 46 ID	BLOQ LOAD E
Virtual Output 46 Events	Disabled
Virtual Output 47 ID	CAMBIO G1-G2
Virtual Output 47 Events	Enabled
Virtual Output 48 ID	ECHO COND 2T
Virtual Output 48 Events	Enabled
Virtual Output 49 ID	ECHO COND 3T
Virtual Output 49 Events	Enabled
Virtual Output 50 ID	POTT OP 2T
Virtual Output 50 Events	Enabled

RESETTING

Operand	reset led On (VO19)

Max / Centro / Alto Jahuel / 154kV / 7SA612V4.6 070915 Var_A1

MLFB:	7SA61255AE217PR4
Versión del juego de parámetros:	V04.60.10
Ruta del equipo:	C:\Siemens\Digsi4\D4PROJ\Max\P7DI\GV\ST\0000004c
Autor:	
Creado el:	21.10.15 15:47:28
Mod. por última vez el:	21.10.15 16:25:44
Modo de operación:	Sin línea
Comentario:	
Valores de ajuste en:	Presentación secundaria de los valores

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4.1 Grupo Change Group 46

1 Device Configuration

Nº	Función	Volumen
0103	Setting Group Change Option	Enabled
0110	Trip mode	3pole only
0114	21 Distance protection pickup program	Z< (quadrilateral)
0120	68 Power Swing detection	Enabled
0121	85-21 Pilot Protection for Distance prot	POTT
0122	DTT Direct Transfer Trip	Disabled
0124	50HS Instantaneous SOTF	Enabled
0125	Weak Infeed (Trip and/or Echo)	Enabled
0126	50(N)/51(N) Backup OverCurrent	Time Overcurrent Curve IEC
0131	50N/51N Ground OverCurrent	Time Overcurrent Curve IEC
0132	85-67N Pilot Protection Gnd. OverCurrent	Disabled
0133	79 Auto-Reclose Function	Disabled
0134	Auto-Reclose control mode	with Trip and Action time
0135	25 Synchronism and Voltage Check	Enabled
0136	81 Over/Underfrequency Protection	Disabled
0137	27, 59 Under/Overvoltage Protection	Disabled
0138	Fault Locator	Enabled
0139	50BF Breaker Failure Protection	Enabled
0140	74TC Trip Circuit Supervision	Disabled
0142	49 Thermal Overload Protection	Disabled

2 Power System Data 1

2.1 Grupo Power System Data 1; Grupo Transformers

Grupo Power System Data 1; Grupo Transformers

Nº	Parámetro	Valor	Grupo
0201	CT Starpoint	towards Line	todo
0203	Rated Primary Voltage	154,0 kV	todo
0204	Rated Secondary Voltage (Ph-Ph)	110 V	todo
0205	CT Rated Primary Current	600 A	todo
0206	CT Rated Secondary Current	5A	todo
0210	V4 voltage transformer is	Vsy2 transformer	todo
0211	Matching ratio Phase-VT To Open-Delta-VT	0,58	todo
0212	VT connection for Vsy2	B-G	todo
0214A	Angle adjustment Vsy2-Vsy1	0 °	todo
0215	Matching ratio Vsy1 / Vsy2	1,00	todo
0220	I4 current transformer is	Neutral Current (of the protected line)	todo
0221	Matching ratio I4/Iph for CT's	1,000	todo

2.2 Grupo Power System Data 1; Grupo Power System

Grupo Power System Data 1; Grupo Power System

Nº	Parámetro	Valor	Grupo
0207	System Starpoint is	Solid Grounded	todo
0230	Rated Frequency	50 Hz	todo
0235	Phase Sequence	A B C	todo
0236	Distance measurement unit	km	todo
0237	Setting format for zero seq.comp. format	Zero seq. comp. factor K0 and angle(K0)	todo

2.3 Grupo Power System Data 1; Grupo Breaker

Grupo Power System Data 1; Grupo Breaker

Nº	Parámetro	Valor	Grupo
0239	Closing (operating) time of 52 (CB)	0,06 sec	todo
0240A	Minimum TRIP Command Duration	0,12 sec	todo
0241A	Maximum Close Command Duration	0,25 sec	todo
0242	Dead Time for CB test-autoreclosure	0,10 sec	todo

3 Grupos de parámetros

3.1 Grupo Power System Data 2; Grupo Power System

Grupo Power System Data 2; Grupo Power System

Nº	Parámetro	Valor	Grupo
1103	Measurement: Full Scale Voltage (100%)	154,0 kV	A
1104	Measurement: Full Scale Current (100%)	600 A	A
1105	Line Angle	79 °	A
1211	Angle of inclination, distance charact.	79 °	A
1107	P,Q operational measured values sign	not reversed	A
1110	x' - Line Reactance per length unit	0,0352 Ohm / km	A
1111	Line Length	50,6 km	A
1120	Zero seq. comp. factor K0 for zone Z1	0,809	A
1121	Zero seq. comp. angle for zone Z1	3,02 °	A
1122	Zero seq.comp.factor K0,higher zones >Z1	0,809	A
1123	Zero seq. comp. angle, higher zones >Z1	3,02 °	A

3.2 Grupo Power System Data 2; Grupo Line Status

Grupo Power System Data 2; Grupo Line Status

Nº	Parámetro	Valor	Grupo
1130A	Pole Open Current Threshold	0,25 A	A
1131A	Pole Open Voltage Threshold	11 V	A
1132A	Seal-in Time after ALL closures	0,20 sec	A
1133A	minimal time for line open before SOTF	0,25 sec	A
1134	Recognition of Line Closures with	CBpos(52a) OR Current or Manual close BI	A
1135	RESET of Trip Command	with CB(52a) AND I < PoleOpenCurrent	A
1140A	CT Saturation Threshold	100,0 A	A
1150A	Seal-in Time after MANUAL closures	0,20 sec	A
1151	Manual CLOSE COMMAND generation	NO	A
1152	MANUAL Closure Impulse after CONTROL	<none>	todo

3.3 Grupo 21 Distance protection, general settings; Grupo General

Grupo 21 Distance protection, general settings; Grupo General

Nº	Parámetro	Valor	Grupo
1201	21 Distance protection is	ON	A
1202	Phase Current threshold for dist. meas.	0,25 A	A
1211	Angle of inclination, distance charact.	79 °	A
1208	Series compensated line	NO	A
1232	Instantaneous trip after SwitchOnToFault	with Zone Z1B	A
1241	R load, minimum Load Impedance (ph-g)	9,140 Ohm	A
1242	PHI load, maximum Load Angle (ph-g)	35 °	A
1243	R load, minimum Load Impedance (ph-ph)	9,140 Ohm	A
1244	PHI load, maximum Load Angle (ph-ph)	35 °	A
1357	Z1B enabled before 1st AR (int. or ext.)	NO	A

3.4 Grupo 21 Distance protection, general settings; Grupo Ground faults

Grupo 21 Distance protection, general settings; Grupo Ground faults

Nº	Parámetro	Valor	Grupo
1203	3I0 threshold for neutral current pickup	0,25 A	A
1204	3V0 threshold zero seq. voltage pickup	2 V	A
1207A	3I0>-pickup-stabilisation (3I0>/ Iphmax)	0,10	A
1209A	Criterion of ground fault recognition	3I0> OR 3V0>	A
1221A	Loop selection with 2Ph-G faults	all loops	A

3.5 Grupo 21 Distance protection, general settings; Grupo Time Delays

Grupo 21 Distance protection, general settings; Grupo Time Delays

Nº	Parámetro	Valor	Grupo
1210	21 Condition for zone timer start	with distance pickup	A
1305	T1-1phase, delay for single phase faults	0,00 sec	A
1306	T1multi-ph, delay for multi phase faults	0,00 sec	A
1315	T2-1phase, delay for single phase faults	0,60 sec	A
1316	T2multi-ph, delay for multi phase faults	0,60 sec	A
1325	T3 delay	2,50 sec	A
1335	T4 delay	1,50 sec	A
1345	T5 delay	oo sec	A
1355	T1B-1phase, delay for single ph. faults	0,00 sec	A
1356	T1B-multi-ph, delay for multi ph. faults	0,00 sec	A

3.6 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1

Nº	Parámetro	Valor	Grupo
1301	Operating mode Z1	Forward	A
1302	R(Z1), Resistance for ph-ph-faults	1,860 Ohm	A
1303	X(Z1), Reactance	1,860 Ohm	A
1304	RG(Z1), Resistance for ph-gnd faults	1,860 Ohm	A
1305	T1-1phase, delay for single phase faults	0,00 sec	A
1306	T1multi-ph, delay for multi phase faults	0,00 sec	A
1307	Zone Reduction Angle (load compensation)	0 °	A

3.7 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1B-exten.

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1B-exten.

Nº	Parámetro	Valor	Grupo
1351	Operating mode Z1B (overrreach zone)	Forward	A
1352	R(Z1B), Resistance for ph-ph-faults	8,000 Ohm	A
1353	X(Z1B), Reactance	8,500 Ohm	A
1354	RG(Z1B), Resistance for ph-gnd faults	8,000 Ohm	A
1355	T1B-1phase, delay for single ph. faults	0,00 sec	A
1356	T1B-multi-ph, delay for multi ph. faults	0,00 sec	A
1357	Z1B enabled before 1st AR (int. or ext.)	NO	A

3.8 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z2

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z2

Nº	Parámetro	Valor	Grupo
1311	Operating mode Z2	Forward	A
1312	R(Z2), Resistance for ph-ph-faults	4,266 Ohm	A
1313	X(Z2), Reactance	4,266 Ohm	A
1314	RG(Z2), Resistance for ph-gnd faults	4,266 Ohm	A
1315	T2-1phase, delay for single phase faults	0,60 sec	A
1316	T2multi-ph, delay for multi phase faults	0,60 sec	A

3.9 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z3

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z3

Nº	Parámetro	Valor	Grupo
1321	Operating mode Z3	Reverse	A
1322	R(Z3), Resistance for ph-ph-faults	6,000 Ohm	A
1323	X(Z3), Reactance	6,000 Ohm	A
1324	RG(Z3), Resistance for ph-gnd faults	6,000 Ohm	A
1325	T3 delay	2,50 sec	A

3.10 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z4

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z4

Nº	Parámetro	Valor	Grupo
1331	Operating mode Z4	Forward	A
1332	R(Z4), Resistance for ph-ph-faults	6,500 Ohm	A
1333	X(Z4), Reactance	6,500 Ohm	A
1334	RG(Z4), Resistance for ph-gnd faults	13,000 Ohm	A
1335	T4 delay	1,50 sec	A

3.11 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z5

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z5

Nº	Parámetro	Valor	Grupo
1341	Operating mode Z5	Non-Directional	A
1342	R(Z5), Resistance for ph-ph-faults	14,528 Ohm	A
1343	X(Z5)+, Reactance for Forward direction	14,528 Ohm	A
1344	RG(Z5), Resistance for ph-gnd faults	14,528 Ohm	A
1345	T5 delay	oo sec	A
1346	X(Z5)-, Reactance for Reverse direction	7,000 Ohm	A

3.12 Grupo 68 Power Swing detection

Grupo 68 Power Swing detection

Nº	Parámetro	Valor	Grupo
2002	Power Swing Operating mode	all zones blocked	A
2006	68T Power swing trip	NO	A
2007	68 Trip delay after Power Swing Blocking	0,08 sec	A

3.13 Grupo 85-21 Pilot Prot. for Distance prot.

Grupo 85-21 Pilot Prot. for Distance prot.

Nº	Parámetro	Valor	Grupo
2101	85-21 Pilot Prot. for Distance prot.	ON	A
2102	Type of Line	Three Terminals	A
2103A	Time for send signal prolongation	0,10 sec	A
2109A	Transient Block.: Duration external flt.	0,03 sec	A
2110A	Transient Block.: Blk.T. after ext. flt.	0,17 sec	A

3.14 Grupo 50HS Instantaneous SOTF

Grupo 50HS Instantaneous SOTF

Nº	Parámetro	Valor	Grupo
2401	50HS Instantaneous SOTF-O/C is	ON	A

Grupo 50HS Instantaneous SOTF(2)

Nº	Parámetro	Valor	Grupo
2404	50HS SOTF-O/C PICKUP	9,41 A	A

3.15 Grupo Weak Infeed (Trip and/or Echo)

Grupo Weak Infeed (Trip and/or Echo)

Nº	Parámetro	Valor	Grupo
2501	Weak Infeed option	Echo only	A
2502A	Trip / Echo Delay after carrier receipt	0,04 sec	A
2503A	Trip Extension / Echo Impulse time	0,05 sec	A
2504A	Echo Block Time	0,50 sec	A
2505	Undervoltage (ph-g)	25 V	A
2509	Echo logic: 21 and 67N on common channel	NO	todo

3.16 Grupo 50(N)/51(N) Backup OverCurrent; Grupo General

Grupo 50(N)/51(N) Backup OverCurrent; Grupo General

Nº	Parámetro	Valor	Grupo
2601	Operating mode	ON:only active with Loss of VT sec. cir.	A
2680	Trip time delay after SOTF	0,00 sec	A

3.17 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B1

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B1

Nº	Parámetro	Valor	Grupo
2610	50-B1 Pickup	oo A	A
2611	50-B1 Delay	oo sec	A
2612	50N-B1 Pickup	oo A	A
2613	50N-B1 Delay	oo sec	A
2614	Instantaneous trip via BI	NO	A
2615	Instantaneous trip after SwitchOnToFault	NO	A

3.18 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B2

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B2

Nº	Parámetro	Valor	Grupo
2620	50-B2 Pickup	oo A	A
2621	50-B2 Delay	oo sec	A
2622	50N-B2 Pickup	oo A	A
2623	50N-B2 Delay	oo sec	A
2624	Instantaneous trip via Pilot Prot./BI	NO	A
2625	Instantaneous trip after SwitchOnToFault	NO	A

3.19 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 51(N)-B

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 51(N)-B

Nº	Parámetro	Valor	Grupo
2640	51-B Pickup	6,00 A	A
2642	51-B Time Dial	0,10 sec	A
2646	51-B Additional Time Delay	0,00 sec	A
2650	51N-B Pickup	0,41 A	A
2652	51N-B Time Dial	0,30 sec	A
2656	51N-B Additional Time Delay	0,00 sec	A
2660	IEC Curve	Normal Inverse	A
2670	Instantaneous trip via Pilot Prot./BI	NO	A
2671	Instantaneous trip after SwitchOnToFault	NO	A

3.20 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-STUB

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-STUB

Nº	Parámetro	Valor	Grupo
2630	50-STUB Pickup	oo A	A
2631	50-STUB Delay	oo sec	A
2632	50N-STUB Pickup	oo A	A
2633	50N-STUB Delay	oo sec	A
2634	Instantaneous trip via Pilot Prot./BI	NO	A
2635	Instantaneous trip after SwitchOnToFault	NO	A

3.21 Grupo Measurement Supervision; Grupo Balance / Summ.

Grupo Measurement Supervision; Grupo Balance / Summ.

Nº	Parámetro	Valor	Grupo
2901	Measurement Supervision	ON	A
2902A	Voltage Threshold for Balance Monitoring	50 V	A
2903A	Balance Factor for Voltage Monitor	0,75	A
2904A	Current Threshold for Balance Monitoring	0,50 A	A
2905A	Balance Factor for Current Monitor	0,50	A
2906A	Summated Current Monitoring Threshold	0,50 A	A
2907A	Summated Current Monitoring Factor	0,10	A
2908A	T Balance Factor for Voltage Monitor	5 sec	A
2909A	T Current Balance Monitor	5 sec	A

3.22 Grupo Measurement Supervision; Grupo Meas.Volt.Fail

Grupo Measurement Supervision; Grupo Meas.Volt.Fail

Nº	Parámetro	Valor	Grupo
2910	Fuse Failure Monitor	ON	A
2911A	Minimum Voltage Threshold V>	30 V	A
2912A	Maximum Current Threshold I<	0,50 A	A
2913A	Maximum Voltage Threshold V< (3phase)	5 V	A
2914A	Differential Current Threshold (3phase)	0,50 A	A
2915	Voltage Failure Supervision	with current superv. and CBpos(52a)	A
2916A	Delay Voltage Failure Supervision	3,00 sec	A

3.23 Grupo Measurement Supervision; Grupo VT mcb

Grupo Measurement Supervision; Grupo VT mcb

Nº	Parámetro	Valor	Grupo
2921	VT mcb operating time	5 ms	A

3.24 Grupo Measurement Supervision; Grupo Load Angle

Grupo Measurement Supervision; Grupo Load Angle

Nº	Parámetro	Valor	Grupo
2941	Limit setting PhiA	200 °	A
2942	Limit setting PhiB	340 °	A
2943	Minimum value I1>	0,25 A	A
2944	Minimum value U1>	20 V	A

3.25 Grupo 50N/51N Ground OverCurrent; Grupo General

Grupo 50N/51N Ground OverCurrent; Grupo General

Nº	Parámetro	Valor	Grupo
3101	50N/51N Ground Overcurrent	ON	A
3102	Block 50N/51N for Distance protection	NO	A
3174	Block 50N/51N for Pickup 21	in each zone	A
3104A	Stabilisation Slope with Iphase	10 %	A
3170	2nd harmonic ratio for inrush restraint	20 %	A
3171	Max.Current, overriding inrush restraint	37,50 A	A
3172	Instantaneous mode after SwitchOnToFault	with Pickup and direction	A
3173	Trip time delay after SOTF	0,00 sec	A

3.26 Grupo 50N/51N Ground OverCurrent; Grupo 50N-1

Grupo 50N/51N Ground OverCurrent; Grupo 50N-1

Nº	Parámetro	Valor	Grupo
3110	Operating mode	Inactive	A
3111	Pickup	6,50 A	A
3112	Time Delay	0,30 sec	A
3113	Instantaneous trip via Pilot Prot./BI	NO	A
3114	Instantaneous trip after SwitchOnToFault	NO	A
3115	Inrush Blocking	NO	A

3.27 Grupo 50N/51N Ground OverCurrent; Grupo 50N-2

Grupo 50N/51N Ground OverCurrent; Grupo 50N-2

Nº	Parámetro	Valor	Grupo
3120	Operating mode	Inactive	A
3121	Pickup	0,83 A	A
3122	Time Delay	0,60 sec	A
3123	Instantaneous trip via Pilot Prot./BI	NO	A
3124	Instantaneous trip after SwitchOnToFault	NO	A
3125	Inrush Blocking	NO	A

3.28 Grupo 50N/51N Ground OverCurrent; Grupo 50N-3

Grupo 50N/51N Ground OverCurrent; Grupo 50N-3

Nº	Parámetro	Valor	Grupo
3130	Operating mode	Inactive	A
3131	Pickup	0,83 A	A
3132	Time Delay	0,90 sec	A
3133	Instantaneous trip via Pilot Prot./BI	NO	A
3134	Instantaneous trip after SwitchOnToFault	NO	A
3135	Inrush Blocking	NO	A

3.29 Grupo 50N/51N Ground OverCurrent; Grupo 51N InverseTime

Grupo 50N/51N Ground OverCurrent; Grupo 51N InverseTime

Nº	Parámetro	Valor	Grupo
3140	Operating mode	Forward	A
3141	Pickup	0,41 A	A
3143	Time Dial	0,30 sec	A
3147	Additional Time Delay	0,00 sec	A
3148	Instantaneous trip via Pilot Prot./BI	NO	A
3149	Instantaneous trip after SwitchOnToFault	NO	A
3150	Inrush Blocking	NO	A
3151	IEC Curve	Normal Inverse	A

3.30 Grupo 50N/51N Ground OverCurrent; Grupo Direction

Grupo 50N/51N Ground OverCurrent; Grupo Direction

Nº	Parámetro	Valor	Grupo
3160	Polarization	with Vo + Ig or V2	A
3162A	ALPHA, lower angle for forward direction	338 °	A
3163A	BETA, upper angle for forward direction	122 °	A
3164	Min. zero seq.voltage 3Vo for polarizing	3,0 V	A
3166	Min. neg. seq. polarizing voltage 3V2	3,0 V	A
3167	Min. neg. seq. polarizing current 3I2	0,25 A	A
3168	Compensation angle PHI comp. for Sr	255 °	A
3169	Forward direction power threshold	1,5 VA	A

3.31 Grupo 25 Synchronism and Voltage Check; Grupo General

Grupo 25 Synchronism and Voltage Check; Grupo General

Nº	Parámetro	Valor	Grupo
3501	25 Synchronism and Voltage Check	OFF	A
3502	Voltage threshold dead line / bus	10 V	A
3503	Voltage threshold live line / bus	44 V	A
3504	Maximum permissible voltage	70 V	A
3507	Maximum duration of synchronism-check	1,00 sec	A
3508	Synchronous condition stability timer	0,00 sec	A
3509	Synchronizable circuit breaker	<none>	todo

3.32 Grupo 25 Synchronism and Voltage Check; Grupo with AR

Grupo 25 Synchronism and Voltage Check; Grupo with AR

Nº	Parámetro	Valor	Grupo
3510	Operating mode with AR	without consideration of 52 closing time	A
3511	Maximum voltage difference	10,0 V	A
3512	Maximum frequency difference	0,10 Hz	A
3513	Maximum angle difference	10 °	A
3515A	79 at Vsy2>, Vsy1>, and Synchr.	YES	A
3516	79 at Vsy1< and Vsy2>	NO	A
3517	79 at Vsy1> and Vsy2<	NO	A
3518	79 at Vsy1< and Vsy2<	NO	A
3519	Override of any check before 79	NO	A

3.33 Grupo 25 Synchronism and Voltage Check; Grupo Man.Close+CNTRL

Grupo 25 Synchronism and Voltage Check; Grupo Man.Close+CNTRL

Nº	Parámetro	Valor	Grupo
3530	Operating mode with Man.Cl	without consideration of 52 closing time	A
3531	Maximum voltage difference	5,0 V	A
3532	Maximum frequency difference	0,10 Hz	A
3533	Maximum angle difference	10 °	A
3535A	Manual Close at Vsy2>, Vsy1>, and Synchr	NO	A
3536	Manual Close at Vsy1< and Vsy2>	NO	A
3537	Manual Close at Vsy1> and Vsy2<	NO	A
3538	Manual Close at Vsy1< and Vsy2<	NO	A
3539	Override of any check before Man.Cl	NO	A

3.34 Grupo Fault Locator

Grupo Fault Locator

Nº	Parámetro	Valor	Grupo
3802	Start fault locator with	TRIP	A
3806	Load Compensation	NO	A

3.35 Grupo 50BF Breaker Failure; Grupo 50BF

Grupo 50BF Breaker Failure; Grupo 50BF

Nº	Parámetro	Valor	Grupo
3901	50BF Breaker Failure Protection	ON	A
3902	50BF Pickup current threshold	1,67 A	A
3904	Delay after 1pole start for local trip	0,01 sec	A
3905	Delay after 3pole start for local trip	0,01 sec	A
3906	Delay of 2nd element for busbar trip	0,20 sec	A
3907	Delay for start with defective bkr.	0,00 sec	A
3908	Trip output selection with defective bkr	NO	A
3909	Check Breaker contacts	YES	A

3.36 Grupo 50BF Breaker Failure; Grupo End fault prot.

Grupo 50BF Breaker Failure; Grupo End fault prot.

Nº	Parámetro	Valor	Grupo
3921	End fault element	OFF	A
3922	Trip delay of end fault element	2,00 sec	A

3.37 Grupo 50BF Breaker Failure; Grupo PoleDiscrepancy

Grupo 50BF Breaker Failure; Grupo PoleDiscrepancy

Nº	Parámetro	Valor	Grupo
3931	Pole Discrepancy supervision	OFF	A
3932	Trip delay with pole discrepancy	2,00 sec	A

3.38 Grupo Power System Data 2; Grupo Power System

Grupo Power System Data 2; Grupo Power System

Nº	Parámetro	Valor	Grupo
1103	Measurement: Full Scale Voltage (100%)	154,0 kV	B
1104	Measurement: Full Scale Current (100%)	600 A	B
1105	Line Angle	79 °	B
1211	Angle of inclination, distance charact.	79 °	B
1107	P,Q operational measured values sign	not reversed	B
1110	x' - Line Reactance per length unit	0,0352 Ohm / km	B
1111	Line Length	60,6 km	B
1120	Zero seq. comp. factor K0 for zone Z1	0,809	B
1121	Zero seq. comp. angle for zone Z1	3,02 °	B
1122	Zero seq.comp.factor K0,higher zones >Z1	0,809	B
1123	Zero seq. comp. angle, higher zones >Z1	3,02 °	B

3.39 Grupo Power System Data 2; Grupo Line Status

Grupo Power System Data 2; Grupo Line Status

Nº	Parámetro	Valor	Grupo
1130A	Pole Open Current Threshold	0,50 A	B
1131A	Pole Open Voltage Threshold	11 V	B
1132A	Seal-in Time after ALL closures	0,20 sec	B
1133A	minimal time for line open before SOTF	0,25 sec	B
1134	Recognition of Line Closures with	CBpos(52a) OR Current or Manual close BI	B
1135	RESET of Trip Command	with CB(52a) AND I < PoleOpenCurrent	B
1140A	CT Saturation Threshold	100,0 A	B
1150A	Seal-in Time after MANUAL closures	0,20 sec	B
1151	Manual CLOSE COMMAND generation	NO	B
1152	MANUAL Closure Impulse after CONTROL	<none>	todo

3.40 Grupo 21 Distance protection, general settings; Grupo General

Grupo 21 Distance protection, general settings; Grupo General

Nº	Parámetro	Valor	Grupo
1201	21 Distance protection is	ON	B
1202	Phase Current threshold for dist. meas.	0,50 A	B
1211	Angle of inclination, distance charact.	79 °	B
1208	Series compensated line	NO	B
1232	Instantaneous trip after SwitchOnToFault	with Zone Z1B	B
1241	R load, minimum Load Impedance (ph-g)	oo Ohm	B
1242	PHI load, maximum Load Angle (ph-g)	30 °	B
1243	R load, minimum Load Impedance (ph-ph)	oo Ohm	B
1244	PHI load, maximum Load Angle (ph-ph)	30 °	B
1357	Z1B enabled before 1st AR (int. or ext.)	NO	B

3.41 Grupo 21 Distance protection, general settings; Grupo Ground faults

Grupo 21 Distance protection, general settings; Grupo Ground faults

Nº	Parámetro	Valor	Grupo
1203	3I0 threshold for neutral current pickup	0,50 A	B
1204	3V0 threshold zero seq. voltage pickup	oo V	B
1207A	3I0>-pickup-stabilisation (3I0>/ Iphmax)	0,10	B
1209A	Criterion of ground fault recognition	3I0> OR 3V0>	B
1221A	Loop selection with 2Ph-G faults	all loops	B

3.42 Grupo 21 Distance protection, general settings; Grupo Time Delays

Grupo 21 Distance protection, general settings; Grupo Time Delays

Nº	Parámetro	Valor	Grupo
1210	21 Condition for zone timer start	with distance pickup	B
1305	T1-1phase, delay for single phase faults	0,00 sec	B
1306	T1multi-ph, delay for multi phase faults	0,00 sec	B
1315	T2-1phase, delay for single phase faults	0,40 sec	B
1316	T2multi-ph, delay for multi phase faults	0,40 sec	B
1325	T3 delay	2,00 sec	B
1335	T4 delay	2,00 sec	B
1345	T5 delay	oo sec	B
1355	T1B-1phase, delay for single ph. faults	0,00 sec	B
1356	T1B-multi-ph, delay for multi ph. faults	0,00 sec	B

3.43 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1

Nº	Parámetro	Valor	Grupo
1301	Operating mode Z1	Forward	B
1302	R(Z1), Resistance for ph-ph-faults	1,720 Ohm	B
1303	X(Z1), Reactance	1,720 Ohm	B
1304	RG(Z1), Resistance for ph-gnd faults	3,440 Ohm	B
1305	T1-1phase, delay for single phase faults	0,00 sec	B
1306	T1multi-ph, delay for multi phase faults	0,00 sec	B
1307	Zone Reduction Angle (load compensation)	0 °	B

3.44 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1B-exten.

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1B-exten.

Nº	Parámetro	Valor	Grupo
1351	Operating mode Z1B (overrreach zone)	Forward	B
1352	R(Z1B), Resistance for ph-ph-faults	3,600 Ohm	B
1353	X(Z1B), Reactance	3,600 Ohm	B
1354	RG(Z1B), Resistance for ph-gnd faults	7,200 Ohm	B
1355	T1B-1phase, delay for single ph. faults	0,00 sec	B
1356	T1B-multi-ph, delay for multi ph. faults	0,00 sec	B
1357	Z1B enabled before 1st AR (int. or ext.)	NO	B

3.45 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z2

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z2

Nº	Parámetro	Valor	Grupo
1311	Operating mode Z2	Forward	B
1312	R(Z2), Resistance for ph-ph-faults	3,600 Ohm	B
1313	X(Z2), Reactance	3,600 Ohm	B
1314	RG(Z2), Resistance for ph-gnd faults	7,200 Ohm	B
1315	T2-1phase, delay for single phase faults	0,40 sec	B
1316	T2multi-ph, delay for multi phase faults	0,40 sec	B

3.46 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z3

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z3

Nº	Parámetro	Valor	Grupo
1321	Operating mode Z3	Reverse	B
1322	R(Z3), Resistance for ph-ph-faults	0,800 Ohm	B
1323	X(Z3), Reactance	0,800 Ohm	B
1324	RG(Z3), Resistance for ph-gnd faults	1,300 Ohm	B
1325	T3 delay	2,00 sec	B

3.47 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z4

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z4

Nº	Parámetro	Valor	Grupo
1331	Operating mode Z4	Forward	B
1332	R(Z4), Resistance for ph-ph-faults	4,700 Ohm	B
1333	X(Z4), Reactance	4,700 Ohm	B
1334	RG(Z4), Resistance for ph-gnd faults	9,400 Ohm	B
1335	T4 delay	2,00 sec	B

3.48 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z5

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z5

Nº	Parámetro	Valor	Grupo
1341	Operating mode Z5	Non-Directional	B
1342	R(Z5), Resistance for ph-ph-faults	4,720 Ohm	B
1343	X(Z5)+, Reactance for Forward direction	4,720 Ohm	B
1344	RG(Z5), Resistance for ph-gnd faults	9,420 Ohm	B
1345	T5 delay	oo sec	B
1346	X(Z5)-, Reactance for Reverse direction	3,500 Ohm	B

3.49 Grupo 68 Power Swing detection

Grupo 68 Power Swing detection

Nº	Parámetro	Valor	Grupo
2002	Power Swing Operating mode	all zones blocked	B
2006	68T Power swing trip	NO	B
2007	68 Trip delay after Power Swing Blocking	0,08 sec	B

3.50 Grupo 85-21 Pilot Prot. for Distance prot.

Grupo 85-21 Pilot Prot. for Distance prot.

Nº	Parámetro	Valor	Grupo
2101	85-21 Pilot Prot. for Distance prot.	ON	B
2102	Type of Line	Two Terminals	B
2103A	Time for send signal prolongation	0,08 sec	B
2109A	Transient Block.: Duration external flt.	0,03 sec	B
2110A	Transient Block.: Blk.T. after ext. flt.	0,15 sec	B

3.51 Grupo 50HS Instantaneous SOTF

Grupo 50HS Instantaneous SOTF

Nº	Parámetro	Valor	Grupo
2401	50HS Instantaneous SOTF-O/C is	ON	B
2404	50HS SOTF-O/C PICKUP	12,50 A	B

3.52 Grupo Weak Infeed (Trip and/or Echo)

Grupo Weak Infeed (Trip and/or Echo)

Nº	Parámetro	Valor	Grupo
2501	Weak Infeed option	Echo only	B
2502A	Trip / Echo Delay after carrier receipt	0,04 sec	B
2503A	Trip Extension / Echo Impulse time	0,05 sec	B
2504A	Echo Block Time	0,50 sec	B
2505	Undervoltage (ph-g)	25 V	B
2509	Echo logic: 21 and 67N on common channel	NO	todo

3.53 Grupo 50(N)/51(N) Backup OverCurrent; Grupo General

Grupo 50(N)/51(N) Backup OverCurrent; Grupo General

Nº	Parámetro	Valor	Grupo
2601	Operating mode	ON:only active with Loss of VT sec. cir.	B
2680	Trip time delay after SOTF	0,00 sec	B

3.54 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B1

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B1

Nº	Parámetro	Valor	Grupo
2610	50-B1 Pickup	22,00 A	B
2611	50-B1 Delay	0,01 sec	B
2612	50N-B1 Pickup	11,00 A	B
2613	50N-B1 Delay	0,02 sec	B
2614	Instantaneous trip via BI	NO	B
2615	Instantaneous trip after SwitchOnToFault	NO	B

3.55 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B2

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B2

Nº	Parámetro	Valor	Grupo
2620	50-B2 Pickup	oo A	B
2621	50-B2 Delay	oo sec	B
2622	50N-B2 Pickup	oo A	B
2623	50N-B2 Delay	oo sec	B
2624	Instantaneous trip via Pilot Prot./BI	NO	B
2625	Instantaneous trip after SwitchOnToFault	NO	B

3.56 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 51(N)-B

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 51(N)-B

Nº	Parámetro	Valor	Grupo
2640	51-B Pickup	6,00 A	B
2642	51-B Time Dial	0,21 sec	B
2646	51-B Additional Time Delay	0,00 sec	B
2650	51N-B Pickup	2,40 A	B
2652	51N-B Time Dial	0,12 sec	B
2656	51N-B Additional Time Delay	0,00 sec	B
2660	IEC Curve	Normal Inverse	B
2670	Instantaneous trip via Pilot Prot./BI	NO	B

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 51(N)-B(2)

Nº	Parámetro	Valor	Grupo
2671	Instantaneous trip after SwitchOnToFault	NO	B

3.57 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-STUB

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-STUB

Nº	Parámetro	Valor	Grupo
2630	50-STUB Pickup	oo A	B
2631	50-STUB Delay	oo sec	B
2632	50N-STUB Pickup	oo A	B
2633	50N-STUB Delay	oo sec	B
2634	Instantaneous trip via Pilot Prot./BI	NO	B
2635	Instantaneous trip after SwitchOnToFault	NO	B

3.58 Grupo Measurement Supervision; Grupo Balance / Summ.

Grupo Measurement Supervision; Grupo Balance / Summ.

Nº	Parámetro	Valor	Grupo
2901	Measurement Supervision	ON	B
2902A	Voltage Threshold for Balance Monitoring	50 V	B
2903A	Balance Factor for Voltage Monitor	0,75	B
2904A	Current Threshold for Balance Monitoring	0,50 A	B
2905A	Balance Factor for Current Monitor	0,50	B
2906A	Summated Current Monitoring Threshold	0,50 A	B
2907A	Summated Current Monitoring Factor	0,10	B
2908A	T Balance Factor for Voltage Monitor	5 sec	B
2909A	T Current Balance Monitor	5 sec	B

3.59 Grupo Measurement Supervision; Grupo Meas.Volt.Fail

Grupo Measurement Supervision; Grupo Meas.Volt.Fail

Nº	Parámetro	Valor	Grupo
2910	Fuse Failure Monitor	ON	B
2911A	Minimum Voltage Threshold V>	30 V	B
2912A	Maximum Current Threshold I<	0,50 A	B
2913A	Maximum Voltage Threshold V< (3phase)	5 V	B
2914A	Differential Current Threshold (3phase)	0,50 A	B
2915	Voltage Failure Supervision	with current superv. and CBpos(52a)	B
2916A	Delay Voltage Failure Supervision	3,00 sec	B

3.60 Grupo Measurement Supervision; Grupo VT mcb

Grupo Measurement Supervision; Grupo VT mcb

Nº	Parámetro	Valor	Grupo
2921	VT mcb operating time	5 ms	B

3.61 Grupo Measurement Supervision; Grupo Load Angle

Grupo Measurement Supervision; Grupo Load Angle

Nº	Parámetro	Valor	Grupo
2941	Limit setting PhiA	200 °	B
2942	Limit setting PhiB	340 °	B
2943	Minimum value I1>	0,25 A	B
2944	Minimum value U1>	20 V	B

3.62 Grupo 50N/51N Ground OverCurrent; Grupo General

Grupo 50N/51N Ground OverCurrent; Grupo General

Nº	Parámetro	Valor	Grupo
3101	50N/51N Ground Overcurrent	ON	B
3102	Block 50N/51N for Distance protection	NO	B
3174	Block 50N/51N for Pickup 21	in each zone	B
3104A	Stabilisation Slope with Iphase	10 %	B
3170	2nd harmonic ratio for inrush restraint	15 %	B
3171	Max.Current, overriding inrush restraint	37,50 A	B
3172	Instantaneous mode after SwitchOnToFault	with Pickup and direction	B
3173	Trip time delay after SOTF	0,00 sec	B

3.63 Grupo 50N/51N Ground OverCurrent; Grupo 50N-1

Grupo 50N/51N Ground OverCurrent; Grupo 50N-1

Nº	Parámetro	Valor	Grupo
3110	Operating mode	Forward	B
3111	Pickup	11,00 A	B
3112	Time Delay	0,03 sec	B
3113	Instantaneous trip via Pilot Prot./BI	NO	B
3114	Instantaneous trip after SwitchOnToFault	NO	B
3115	Inrush Blocking	NO	B

3.64 Grupo 50N/51N Ground OverCurrent; Grupo 50N-2

Grupo 50N/51N Ground OverCurrent; Grupo 50N-2

Nº	Parámetro	Valor	Grupo
3120	Operating mode	Inactive	B
3121	Pickup	0,83 A	B
3122	Time Delay	0,60 sec	B
3123	Instantaneous trip via Pilot Prot./BI	NO	B
3124	Instantaneous trip after SwitchOnToFault	NO	B
3125	Inrush Blocking	NO	B

3.65 Grupo 50N/51N Ground OverCurrent; Grupo 50N-3

Grupo 50N/51N Ground OverCurrent; Grupo 50N-3

Nº	Parámetro	Valor	Grupo
3130	Operating mode	Inactive	B
3131	Pickup	0,83 A	B
3132	Time Delay	0,90 sec	B
3133	Instantaneous trip via Pilot Prot./BI	NO	B
3134	Instantaneous trip after SwitchOnToFault	NO	B
3135	Inrush Blocking	NO	B

3.66 Grupo 50N/51N Ground OverCurrent; Grupo 51N InverseTime

Grupo 50N/51N Ground OverCurrent; Grupo 51N InverseTime

Nº	Parámetro	Valor	Grupo
3140	Operating mode	Forward	B
3141	Pickup	2,40 A	B
3143	Time Dial	0,13 sec	B
3147	Additional Time Delay	0,00 sec	B
3148	Instantaneous trip via Pilot Prot./BI	NO	B
3149	Instantaneous trip after SwitchOnToFault	NO	B
3150	Inrush Blocking	NO	B
3151	IEC Curve	Normal Inverse	B

3.67 Grupo 50N/51N Ground OverCurrent; Grupo Direction

Grupo 50N/51N Ground OverCurrent; Grupo Direction

Nº	Parámetro	Valor	Grupo
3160	Polarization	with Vo + Ig or V2	B
3162A	ALPHA, lower angle for forward direction	338 °	B
3163A	BETA, upper angle for forward direction	122 °	B
3164	Min. zero seq.voltage 3Vo for polarizing	3,0 V	B
3166	Min. neg. seq. polarizing voltage 3V2	3,0 V	B
3167	Min. neg. seq. polarizing current 3I2	0,25 A	B
3168	Compensation angle PHI comp. for Sr	255 °	B
3169	Forward direction power threshold	1,5 VA	B

3.68 Grupo 25 Synchronism and Voltage Check; Grupo General

Grupo 25 Synchronism and Voltage Check; Grupo General

Nº	Parámetro	Valor	Grupo
3501	25 Synchronism and Voltage Check	ON	B
3502	Voltage threshold dead line / bus	10 V	B
3503	Voltage threshold live line / bus	44 V	B
3504	Maximum permissible voltage	70 V	B
3507	Maximum duration of synchronism-check	1,00 sec	B
3508	Synchronous condition stability timer	0,00 sec	B
3509	Synchronizable circuit breaker	<none>	todo

3.69 Grupo 25 Synchronism and Voltage Check; Grupo with AR

Grupo 25 Synchronism and Voltage Check; Grupo with AR

Nº	Parámetro	Valor	Grupo
3510	Operating mode with AR	without consideration of 52 closing time	B
3511	Maximum voltage difference	10,0 V	B
3512	Maximum frequency difference	0,10 Hz	B
3513	Maximum angle difference	10 °	B
3515A	79 at Vsy2>, Vsy1>, and Synchr.	YES	B
3516	79 at Vsy1< and Vsy2>	NO	B
3517	79 at Vsy1> and Vsy2<	NO	B
3518	79 at Vsy1< and Vsy2<	NO	B
3519	Override of any check before 79	NO	B

3.70 Grupo 25 Synchronism and Voltage Check; Grupo Man.Close+CNTRL

Grupo 25 Synchronism and Voltage Check; Grupo Man.Close+CNTRL

Nº	Parámetro	Valor	Grupo
3530	Operating mode with Man.Cl	without consideration of 52 closing time	B
3531	Maximum voltage difference	10,0 V	B
3532	Maximum frequency difference	0,10 Hz	B
3533	Maximum angle difference	10 °	B
3535A	Manual Close at Vsy2>, Vsy1>, and Synchr	NO	B
3536	Manual Close at Vsy1< and Vsy2>	NO	B
3537	Manual Close at Vsy1> and Vsy2<	NO	B
3538	Manual Close at Vsy1< and Vsy2<	NO	B
3539	Override of any check before Man.Cl	NO	B

3.71 Grupo Fault Locator

Grupo Fault Locator

Nº	Parámetro	Valor	Grupo
3802	Start fault locator with	TRIP	B
3806	Load Compensation	NO	B

3.72 Grupo 50BF Breaker Failure; Grupo 50BF

Grupo 50BF Breaker Failure; Grupo 50BF

Nº	Parámetro	Valor	Grupo
3901	50BF Breaker Failure Protection	ON	B
3902	50BF Pickup current threshold	6,00 A	B
3904	Delay after 1pole start for local trip	0,02 sec	B
3905	Delay after 3pole start for local trip	0,02 sec	B
3906	Delay of 2nd element for busbar trip	0,20 sec	B
3907	Delay for start with defective bkr.	0,00 sec	B
3908	Trip output selection with defective bkr	NO	B
3909	Check Breaker contacts	YES	B

3.73 Grupo 50BF Breaker Failure; Grupo End fault prot.

Grupo 50BF Breaker Failure; Grupo End fault prot.

Nº	Parámetro	Valor	Grupo
3921	End fault element	OFF	B
3922	Trip delay of end fault element	2,00 sec	B

3.74 Grupo 50BF Breaker Failure; Grupo PoleDiscrepancy

Grupo 50BF Breaker Failure; Grupo PoleDiscrepancy

Nº	Parámetro	Valor	Grupo
3931	Pole Discrepancy supervision	OFF	B
3932	Trip delay with pole discrepancy	2,00 sec	B

3.75 Grupo Power System Data 2; Grupo Power System

Grupo Power System Data 2; Grupo Power System

Nº	Parámetro	Valor	Grupo
1103	Measurement: Full Scale Voltage (100%)	154,0 kV	C
1104	Measurement: Full Scale Current (100%)	600 A	C
1105	Line Angle	79 °	C
1211	Angle of inclination, distance charact.	79 °	C
1107	P,Q operational measured values sign	not reversed	C
1110	x' - Line Reactance per length unit	0,0352 Ohm / km	C
1111	Line Length	60,6 km	C
1120	Zero seq. comp. factor K0 for zone Z1	0,809	C
1121	Zero seq. comp. angle for zone Z1	3,02 °	C
1122	Zero seq.comp.factor K0,higher zones >Z1	0,809	C
1123	Zero seq. comp. angle, higher zones >Z1	3,02 °	C

3.76 Grupo Power System Data 2; Grupo Line Status

Grupo Power System Data 2; Grupo Line Status

Nº	Parámetro	Valor	Grupo
1130A	Pole Open Current Threshold	0,50 A	C
1131A	Pole Open Voltage Threshold	11 V	C
1132A	Seal-in Time after ALL closures	0,20 sec	C
1133A	minimal time for line open before SOTF	0,25 sec	C
1134	Recognition of Line Closures with	CBpos(52a) OR Current or Manual close BI	C
1135	RESET of Trip Command	with CB(52a) AND I < PoleOpenCurrent	C
1140A	CT Saturation Threshold	100,0 A	C
1150A	Seal-in Time after MANUAL closures	0,20 sec	C
1151	Manual CLOSE COMMAND generation	NO	C
1152	MANUAL Closure Impulse after CONTROL	<none>	todo

3.77 Grupo 21 Distance protection, general settings; Grupo General

Grupo 21 Distance protection, general settings; Grupo General

Nº	Parámetro	Valor	Grupo
1201	21 Distance protection is	ON	C
1202	Phase Current threshold for dist. meas.	0,50 A	C
1211	Angle of inclination, distance charact.	79 °	C
1208	Series compensated line	NO	C
1232	Instantaneous trip after SwitchOnToFault	with Zone Z1B	C
1241	R load, minimum Load Impedance (ph-g)	oo Ohm	C
1242	PHI load, maximum Load Angle (ph-g)	30 °	C
1243	R load, minimum Load Impedance (ph-ph)	oo Ohm	C
1244	PHI load, maximum Load Angle (ph-ph)	30 °	C
1357	Z1B enabled before 1st AR (int. or ext.)	YES	C

3.78 Grupo 21 Distance protection, general settings; Grupo Ground faults

Grupo 21 Distance protection, general settings; Grupo Ground faults

Nº	Parámetro	Valor	Grupo
1203	3I0 threshold for neutral current pickup	0,50 A	C
1204	3V0 threshold zero seq. voltage pickup	oo V	C
1207A	3I0>-pickup-stabilisation (3I0>/ Iphmax)	0,10	C
1209A	Criterion of ground fault recognition	3I0> OR 3V0>	C
1221A	Loop selection with 2Ph-G faults	all loops	C

3.79 Grupo 21 Distance protection, general settings; Grupo Time Delays

Grupo 21 Distance protection, general settings; Grupo Time Delays

Nº	Parámetro	Valor	Grupo
1210	21 Condition for zone timer start	with distance pickup	C
1305	T1-1phase, delay for single phase faults	0,00 sec	C
1306	T1multi-ph, delay for multi phase faults	0,00 sec	C
1315	T2-1phase, delay for single phase faults	0,60 sec	C
1316	T2multi-ph, delay for multi phase faults	0,60 sec	C
1325	T3 delay	2,00 sec	C
1335	T4 delay	2,00 sec	C
1345	T5 delay	oo sec	C
1355	T1B-1phase, delay for single ph. faults	0,00 sec	C
1356	T1B-multi-ph, delay for multi ph. faults	0,00 sec	C

3.80 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1

Nº	Parámetro	Valor	Grupo
1301	Operating mode Z1	Forward	C
1302	R(Z1), Resistance for ph-ph-faults	1,720 Ohm	C
1303	X(Z1), Reactance	1,720 Ohm	C
1304	RG(Z1), Resistance for ph-gnd faults	3,440 Ohm	C
1305	T1-1phase, delay for single phase faults	0,00 sec	C
1306	T1multi-ph, delay for multi phase faults	0,00 sec	C
1307	Zone Reduction Angle (load compensation)	0 °	C

3.81 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1B-exten.

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1B-exten.

Nº	Parámetro	Valor	Grupo
1351	Operating mode Z1B (overrreach zone)	Forward	C
1352	R(Z1B), Resistance for ph-ph-faults	4,700 Ohm	C
1353	X(Z1B), Reactance	5,200 Ohm	C
1354	RG(Z1B), Resistance for ph-gnd faults	7,200 Ohm	C
1355	T1B-1phase, delay for single ph. faults	0,00 sec	C
1356	T1B-multi-ph, delay for multi ph. faults	0,00 sec	C
1357	Z1B enabled before 1st AR (int. or ext.)	YES	C

3.82 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z2

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z2

Nº	Parámetro	Valor	Grupo
1311	Operating mode Z2	Forward	C
1312	R(Z2), Resistance for ph-ph-faults	3,600 Ohm	C
1313	X(Z2), Reactance	3,600 Ohm	C
1314	RG(Z2), Resistance for ph-gnd faults	7,200 Ohm	C
1315	T2-1phase, delay for single phase faults	0,60 sec	C
1316	T2multi-ph, delay for multi phase faults	0,60 sec	C

3.83 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z3

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z3

Nº	Parámetro	Valor	Grupo
1321	Operating mode Z3	Reverse	C
1322	R(Z3), Resistance for ph-ph-faults	4,000 Ohm	C
1323	X(Z3), Reactance	4,000 Ohm	C
1324	RG(Z3), Resistance for ph-gnd faults	8,000 Ohm	C
1325	T3 delay	2,00 sec	C

3.84 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z4

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z4

Nº	Parámetro	Valor	Grupo
1331	Operating mode Z4	Forward	C
1332	R(Z4), Resistance for ph-ph-faults	4,700 Ohm	C
1333	X(Z4), Reactance	4,700 Ohm	C
1334	RG(Z4), Resistance for ph-gnd faults	9,400 Ohm	C
1335	T4 delay	2,00 sec	C

3.85 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z5

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z5

Nº	Parámetro	Valor	Grupo
1341	Operating mode Z5	Non-Directional	C
1342	R(Z5), Resistance for ph-ph-faults	4,720 Ohm	C
1343	X(Z5)+, Reactance for Forward direction	4,720 Ohm	C
1344	RG(Z5), Resistance for ph-gnd faults	9,420 Ohm	C
1345	T5 delay	oo sec	C
1346	X(Z5)-, Reactance for Reverse direction	3,500 Ohm	C

3.86 Grupo 68 Power Swing detection

Grupo 68 Power Swing detection

Nº	Parámetro	Valor	Grupo
2002	Power Swing Operating mode	all zones blocked	C
2006	68T Power swing trip	NO	C
2007	68 Trip delay after Power Swing Blocking	0,08 sec	C

3.87 Grupo 85-21 Pilot Prot. for Distance prot.

Grupo 85-21 Pilot Prot. for Distance prot.

Nº	Parámetro	Valor	Grupo
2101	85-21 Pilot Prot. for Distance prot.	ON	C
2102	Type of Line	Two Terminals	C
2103A	Time for send signal prolongation	0,08 sec	C
2109A	Transient Block.: Duration external flt.	0,03 sec	C
2110A	Transient Block.: Blk.T. after ext. flt.	0,15 sec	C

3.88 Grupo 50HS Instantaneous SOTF

Grupo 50HS Instantaneous SOTF

Nº	Parámetro	Valor	Grupo
2401	50HS Instantaneous SOTF-O/C is	ON	C
2404	50HS SOTF-O/C PICKUP	12,50 A	C

3.89 Grupo Weak Infeed (Trip and/or Echo)

Grupo Weak Infeed (Trip and/or Echo)

Nº	Parámetro	Valor	Grupo
2501	Weak Infeed option	Echo only	C
2502A	Trip / Echo Delay after carrier receipt	0,04 sec	C
2503A	Trip Extension / Echo Impulse time	0,05 sec	C
2504A	Echo Block Time	0,50 sec	C
2505	Undervoltage (ph-g)	25 V	C
2509	Echo logic: 21 and 67N on common channel	NO	todo

3.90 Grupo 50(N)/51(N) Backup OverCurrent; Grupo General

Grupo 50(N)/51(N) Backup OverCurrent; Grupo General

Nº	Parámetro	Valor	Grupo
2601	Operating mode	ON:only active with Loss of VT sec. cir.	C
2680	Trip time delay after SOTF	0,00 sec	C

3.91 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B1

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B1

Nº	Parámetro	Valor	Grupo
2610	50-B1 Pickup	22,00 A	C
2611	50-B1 Delay	0,01 sec	C
2612	50N-B1 Pickup	11,00 A	C
2613	50N-B1 Delay	0,02 sec	C
2614	Instantaneous trip via BI	NO	C
2615	Instantaneous trip after SwitchOnToFault	NO	C

3.92 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B2

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B2

Nº	Parámetro	Valor	Grupo
2620	50-B2 Pickup	oo A	C
2621	50-B2 Delay	oo sec	C
2622	50N-B2 Pickup	oo A	C
2623	50N-B2 Delay	oo sec	C
2624	Instantaneous trip via Pilot Prot./BI	NO	C
2625	Instantaneous trip after SwitchOnToFault	NO	C

3.93 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 51(N)-B

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 51(N)-B

Nº	Parámetro	Valor	Grupo
2640	51-B Pickup	6,00 A	C
2642	51-B Time Dial	0,21 sec	C
2646	51-B Additional Time Delay	0,00 sec	C
2650	51N-B Pickup	2,40 A	C
2652	51N-B Time Dial	0,12 sec	C
2656	51N-B Additional Time Delay	0,00 sec	C
2660	IEC Curve	Normal Inverse	C
2670	Instantaneous trip via Pilot Prot./BI	NO	C

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 51(N)-B(2)

Nº	Parámetro	Valor	Grupo
2671	Instantaneous trip after SwitchOnToFault	NO	C

3.94 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-STUB

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-STUB

Nº	Parámetro	Valor	Grupo
2630	50-STUB Pickup	oo A	C
2631	50-STUB Delay	oo sec	C
2632	50N-STUB Pickup	oo A	C
2633	50N-STUB Delay	oo sec	C
2634	Instantaneous trip via Pilot Prot./BI	NO	C
2635	Instantaneous trip after SwitchOnToFault	NO	C

3.95 Grupo Measurement Supervision; Grupo Balance / Summ.

Grupo Measurement Supervision; Grupo Balance / Summ.

Nº	Parámetro	Valor	Grupo
2901	Measurement Supervision	ON	C
2902A	Voltage Threshold for Balance Monitoring	50 V	C
2903A	Balance Factor for Voltage Monitor	0,75	C
2904A	Current Threshold for Balance Monitoring	0,50 A	C
2905A	Balance Factor for Current Monitor	0,50	C
2906A	Summated Current Monitoring Threshold	0,50 A	C
2907A	Summated Current Monitoring Factor	0,10	C
2908A	T Balance Factor for Voltage Monitor	5 sec	C
2909A	T Current Balance Monitor	5 sec	C

3.96 Grupo Measurement Supervision; Grupo Meas.Volt.Fail

Grupo Measurement Supervision; Grupo Meas.Volt.Fail

Nº	Parámetro	Valor	Grupo
2910	Fuse Failure Monitor	ON	C
2911A	Minimum Voltage Threshold V>	30 V	C
2912A	Maximum Current Threshold I<	0,50 A	C
2913A	Maximum Voltage Threshold V< (3phase)	5 V	C
2914A	Differential Current Threshold (3phase)	0,50 A	C
2915	Voltage Failure Supervision	with current superv. and CBpos(52a)	C
2916A	Delay Voltage Failure Supervision	3,00 sec	C

3.97 Grupo Measurement Supervision; Grupo VT mcb

Grupo Measurement Supervision; Grupo VT mcb

Nº	Parámetro	Valor	Grupo
2921	VT mcb operating time	5 ms	C

3.98 Grupo Measurement Supervision; Grupo Load Angle

Grupo Measurement Supervision; Grupo Load Angle

Nº	Parámetro	Valor	Grupo
2941	Limit setting PhiA	200 °	C
2942	Limit setting PhiB	340 °	C
2943	Minimum value I1>	0,25 A	C
2944	Minimum value U1>	20 V	C

3.99 Grupo 50N/51N Ground OverCurrent; Grupo General

Grupo 50N/51N Ground OverCurrent; Grupo General

Nº	Parámetro	Valor	Grupo
3101	50N/51N Ground Overcurrent	ON	C
3102	Block 50N/51N for Distance protection	NO	C
3174	Block 50N/51N for Pickup 21	in each zone	C
3104A	Stabilisation Slope with Iphase	10 %	C
3170	2nd harmonic ratio for inrush restraint	15 %	C
3171	Max.Current, overriding inrush restraint	37,50 A	C
3172	Instantaneous mode after SwitchOnToFault	with Pickup and direction	C
3173	Trip time delay after SOTF	0,00 sec	C

3.100 Grupo 50N/51N Ground OverCurrent; Grupo 50N-1

Grupo 50N/51N Ground OverCurrent; Grupo 50N-1

Nº	Parámetro	Valor	Grupo
3110	Operating mode	Forward	C
3111	Pickup	11,00 A	C
3112	Time Delay	0,03 sec	C
3113	Instantaneous trip via Pilot Prot./BI	NO	C
3114	Instantaneous trip after SwitchOnToFault	NO	C
3115	Inrush Blocking	NO	C

3.101 Grupo 50N/51N Ground OverCurrent; Grupo 50N-2

Grupo 50N/51N Ground OverCurrent; Grupo 50N-2

Nº	Parámetro	Valor	Grupo
3120	Operating mode	Inactive	C
3121	Pickup	0,83 A	C
3122	Time Delay	0,60 sec	C
3123	Instantaneous trip via Pilot Prot./BI	NO	C
3124	Instantaneous trip after SwitchOnToFault	NO	C
3125	Inrush Blocking	NO	C

3.102 Grupo 50N/51N Ground OverCurrent; Grupo 50N-3

Grupo 50N/51N Ground OverCurrent; Grupo 50N-3

Nº	Parámetro	Valor	Grupo
3130	Operating mode	Inactive	C
3131	Pickup	0,83 A	C
3132	Time Delay	0,90 sec	C
3133	Instantaneous trip via Pilot Prot./BI	NO	C
3134	Instantaneous trip after SwitchOnToFault	NO	C
3135	Inrush Blocking	NO	C

3.103 Grupo 50N/51N Ground OverCurrent; Grupo 51N InverseTime

Grupo 50N/51N Ground OverCurrent; Grupo 51N InverseTime

Nº	Parámetro	Valor	Grupo
3140	Operating mode	Forward	C
3141	Pickup	2,40 A	C
3143	Time Dial	0,13 sec	C
3147	Additional Time Delay	0,00 sec	C
3148	Instantaneous trip via Pilot Prot./BI	NO	C
3149	Instantaneous trip after SwitchOnToFault	NO	C
3150	Inrush Blocking	NO	C
3151	IEC Curve	Normal Inverse	C

3.104 Grupo 50N/51N Ground OverCurrent; Grupo Direction

Grupo 50N/51N Ground OverCurrent; Grupo Direction

Nº	Parámetro	Valor	Grupo
3160	Polarization	with Vo + Ig or V2	C
3162A	ALPHA, lower angle for forward direction	338 °	C
3163A	BETA, upper angle for forward direction	122 °	C
3164	Min. zero seq.voltage 3Vo for polarizing	3,0 V	C
3166	Min. neg. seq. polarizing voltage 3V2	3,0 V	C
3167	Min. neg. seq. polarizing current 3I2	0,25 A	C
3168	Compensation angle PHI comp. for Sr	255 °	C
3169	Forward direction power threshold	1,5 VA	C

3.105 Grupo 25 Synchronism and Voltage Check; Grupo General

Grupo 25 Synchronism and Voltage Check; Grupo General

Nº	Parámetro	Valor	Grupo
3501	25 Synchronism and Voltage Check	ON	C
3502	Voltage threshold dead line / bus	10 V	C
3503	Voltage threshold live line / bus	44 V	C
3504	Maximum permissible voltage	70 V	C
3507	Maximum duration of synchronism-check	1,00 sec	C
3508	Synchronous condition stability timer	0,00 sec	C
3509	Synchronizable circuit breaker	<none>	todo

3.106 Grupo 25 Synchronism and Voltage Check; Grupo with AR

Grupo 25 Synchronism and Voltage Check; Grupo with AR

Nº	Parámetro	Valor	Grupo
3510	Operating mode with AR	without consideration of 52 closing time	C
3511	Maximum voltage difference	10,0 V	C
3512	Maximum frequency difference	0,10 Hz	C
3513	Maximum angle difference	10 °	C
3515A	79 at Vsy2>, Vsy1>, and Synchr.	YES	C
3516	79 at Vsy1< and Vsy2>	NO	C
3517	79 at Vsy1> and Vsy2<	NO	C
3518	79 at Vsy1< and Vsy2<	NO	C
3519	Override of any check before 79	NO	C

3.107 Grupo 25 Synchronism and Voltage Check; Grupo Man.Close+CNTRL

Grupo 25 Synchronism and Voltage Check; Grupo Man.Close+CNTRL

Nº	Parámetro	Valor	Grupo
3530	Operating mode with Man.Cl	without consideration of 52 closing time	C
3531	Maximum voltage difference	10,0 V	C
3532	Maximum frequency difference	0,10 Hz	C
3533	Maximum angle difference	10 °	C
3535A	Manual Close at Vsy2>, Vsy1>, and Synchr	NO	C
3536	Manual Close at Vsy1< and Vsy2>	NO	C
3537	Manual Close at Vsy1> and Vsy2<	NO	C
3538	Manual Close at Vsy1< and Vsy2<	NO	C
3539	Override of any check before Man.Cl	NO	C

3.108 Grupo Fault Locator

Grupo Fault Locator

Nº	Parámetro	Valor	Grupo
3802	Start fault locator with	TRIP	C
3806	Load Compensation	NO	C

3.109 Grupo 50BF Breaker Failure; Grupo 50BF

Grupo 50BF Breaker Failure; Grupo 50BF

Nº	Parámetro	Valor	Grupo
3901	50BF Breaker Failure Protection	ON	C
3902	50BF Pickup current threshold	6,00 A	C
3904	Delay after 1pole start for local trip	0,02 sec	C
3905	Delay after 3pole start for local trip	0,02 sec	C
3906	Delay of 2nd element for busbar trip	0,20 sec	C
3907	Delay for start with defective bkr.	0,00 sec	C
3908	Trip output selection with defective bkr	NO	C
3909	Check Breaker contacts	YES	C

3.110 Grupo 50BF Breaker Failure; Grupo End fault prot.

Grupo 50BF Breaker Failure; Grupo End fault prot.

Nº	Parámetro	Valor	Grupo
3921	End fault element	OFF	C
3922	Trip delay of end fault element	2,00 sec	C

3.111 Grupo 50BF Breaker Failure; Grupo PoleDiscrepancy

Grupo 50BF Breaker Failure; Grupo PoleDiscrepancy

Nº	Parámetro	Valor	Grupo
3931	Pole Discrepancy supervision	OFF	C
3932	Trip delay with pole discrepancy	2,00 sec	C

4 Change Group

4.1 Grupo Change Group

Grupo Change Group

Nº	Parámetro	Valor	Grupo
0302	Change to Another Setting Group	Binary Input	todo

CONTROL DE REVISIÓN DEL CRAP

REVISOR	FECHA	N° EAP	OBSERVACIONES
Max Missene M.	07-09-2015	Nº 75/2015	Cambio de ajustes para evitar que la Z1B actúe de forma instantánea en Sistema 2 protección Siemens 7SA61 .

Razón de TTCC/TTPP

TTCC: 600/5

TTPP: $\frac{154000}{\sqrt{3}}/110/\frac{110}{\sqrt{3}}$

Particularidades de Ajustes

- No hay.

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DEVICE DEFINITION
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ORDER CODE: D60-G00-HCH-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

PRODUCT SETUP

DISPLAY PROPERTIES

Flash Message Time	1.0 s
Default Message Timeout	60 s
Default Message Intensity (VFD Only)	25 %
Screen Saver Feature (LCD Only)	Enabled
Screen Saver Wait Time (LCD Only)	30 min
Current Cutoff Level	0.020 pu
Voltage Cutoff Level	1.0 V

COMMUNICATIONS

SERIAL PORTS

RS485 Com2 Baud Rate	19200
RS485 Com2 Parity	None
RS485 Com2 Response Min Time	0 ms

NETWORK

IP Address	10. 80.153.213
IP Subnet Mask	255.255.255. 0
Gateway IP Address	10. 80.153.210
Ethernet Operation Mode	Full-Duplex

MODBUS PROTOCOL

Modbus Slave Address	254
Modbus TCP Port Number	502

HTTP

HTTP TCP Port Number	80

TFTP

TFTP Main UDP Port Number	69
TFTP Data UDP Port Number 1	0
TFTP Data UDP Port Number 2	0

REAL TIME CLOCK

IRIG-B Signal Type	DC Shift
Real Time Clock Events	Enabled

FAULT REPORT

Fault Report 1 Source	LINEA (SRC 1)
Fault Report 1 Trigger	pkp Z1o z2 On (VO4)
Fault Report 1 Positive Seq (Z1) Mag	6.73 ohms
Fault Report 1 Positive Seq (Z1) Angle	75 deg
Fault Report 1 Zero Seq (Z0) Mag	23.38 ohms
Fault Report 1 Zero Seq (Z0) Angle	80 deg
Fault Report 1 Line Length Units	km
Fault Report 1 Line Length	50.6

OSCILLOGRAPHY

Number Of Records	5
Trigger Mode	Automatic Overwrite
Trigger Position	30 %
Trigger Source	OSCILOGRAFIA On (VO3)
AC Input Waveforms	32 samples/cycle
Digital Channel 1	PH DIST Z1 OP
Digital Channel 2	PH DIST Z2 OP
Digital Channel 3	PH DIST Z3 OP
Digital Channel 4	PH DIST Z4 OP
Digital Channel 5	GND DIST Z1 OP
Digital Channel 6	GND DIST Z2 OP
Digital Channel 7	GND DIST Z3 OP
Digital Channel 8	GND DIST Z4 OP
Digital Channel 9	PHASE TOC1 OP
Digital Channel 10	PH DIR1 BLK
Digital Channel 11	NEUTRAL TOC1 OP
Digital Channel 12	NTRL DIR OC1 REV
Digital Channel 13	NEG SEQ DIR OC1 FWD
Digital Channel 14	PUTT OP
Digital Channel 15	POWER SWING BLOCK
Digital Channel 16	PH DIST Z1 PKP

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DESCRIPTION: (NONE)
TEXT COLOR

OSCILLOGRAPHY (continued from last page)

Digital Channel 17	PH DIST Z2 PKP
Digital Channel 18	PH DIST Z3 PKP
Digital Channel 19	PH DIST Z4 PKP
Digital Channel 20	LINE PICKUP OP
Digital Channel 21	PHASE TOC1 OP
Digital Channel 22	AR 1-P RIP
Digital Channel 23	AR CLOSE BKR 1
Digital Channel 24	AR FORCE 3-P TRIP
Digital Channel 25	SYNC 1 SYNC OP
Digital Channel 26	Cont Ip 13 On(W3a)
Digital Channel 27	52A2 (a) On(H7a)
Digital Channel 28	79 conectado On(H7c)
Digital Channel 29	86B--> 50BF On(H8a)
Digital Channel 30	Cont Ip 7 On(U8a)
Digital Channel 31	Cont Ip 8 On(U8c)
Digital Channel 32	Rx TINGUI On(W1a)
Digital Channel 33	80 SISTEMA 1 On(W1c)
Digital Channel 34	Cont Ip 16 On(W4c)
Digital Channel 35	Cont Ip 17 On(W5a)
Digital Channel 36	GND DIST Z1 PKP
Digital Channel 37	GND DIST Z2 PKP
Digital Channel 38	GND DIST Z3 PKP
Digital Channel 39	GND DIST Z4 PKP
Digital Channel 40	PUTT TX1
Digital Channel 41	PUTT TX2
Digital Channel 42	BLQ Zonas PH On (VO1)
Digital Channel 43	TRIP GRAL On (VO2)
Digital Channel 44	pkp Z1o z2 On (VO4)
Digital Channel 45	BLOq reconec On (VO5)
Digital Channel 46	ORD. CIERRE On (VO6)
Digital Channel 47	BL-NTCO-NIOC On (VO7)
Digital Channel 48	POWER SWING 50DD
Digital Channel 49	POWER SWING INNER
Digital Channel 50	POWER SWING OUTER
Digital Channel 51	POWER SWING UN/BLOCK
Digital Channel 52	AR BKR 1 BLK
Digital Channel 53	AR CLOSE BKR 1
Digital Channel 54	AR INCOMPLETE SEQ
Digital Channel 55	SYNC 1 CLS OP
Digital Channel 56	SYNC 1 SYNC OP
Digital Channel 57	PH DIR1 BLK
Digital Channel 58	PHASE SELECT 3P
Digital Channel 59	Tx RANCAGUA On (VO44)
Digital Channel 60	Rx RANCAGUA On(H8c)
Digital Channel 61	Tx TINGUI On (VO45)
Digital Channel 62	Rx TINGUI On(W1a)
Analog Channel 1	SRC1 I_0 Mag
Analog Channel 2	SRC1 Ib Mag
Analog Channel 3	SRC1 Ic Mag
Analog Channel 4	SRC1 Ia Angle
Analog Channel 5	SRC1 Ib Angle
Analog Channel 6	SRC1 Ic Angle
Analog Channel 7	SRC1 Vag Mag
Analog Channel 8	SRC1 Vbg Mag
Analog Channel 9	SRC1 Vcg Mag
Analog Channel 10	SRC1 Vag Angle
Analog Channel 11	SRC1 Vbg Angle
Analog Channel 12	SRC1 Vcg Angle
Analog Channel 13	SRC1 V_1 Mag
Analog Channel 14	SRC1 V_1 Angle
Analog Channel 15	SRC1 Frequency
Analog Channel 16	Tracking Frequency

DATA LOGGER

Data Logger Mode	Continuous
Data Logger Trigger	OFF
Rate	60000 msec

USER-PROGRAMMABLE LEDS

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DEVICE DEFINITION
FILES
ORDER CODE: D60-G00-HCH-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

LED TEST

Function	Enabled
Control	CONTROL PUSHBUTTON 3 ON

TRIP AND ALARMS LEDS

Trip LED Input	TRIP GRAL On (VO2)

USER PROGRAMMABLE LEDS

LED 1: OPERAND	RECEPCION On (VO41)
LED 1: TYPE	Latched
LED 2: OPERAND	OPERA ZONA 1 On (VO12)
LED 2: TYPE	Latched
LED 3: OPERAND	OPERA ZONA 2 On (VO13)
LED 3: TYPE	Latched
LED 4: OPERAND	OPERA ZONA 3 On (VO14)
LED 4: TYPE	Latched
LED 5: OPERAND	OPERA ZONA 4 On (VO15)
LED 5: TYPE	Latched
LED 6: OPERAND	OPERA ZONA 5 On (VO16)
LED 6: TYPE	Latched
LED 7: OPERAND	79 on On (VO17)
LED 7: TYPE	Self-Reset
LED 8: OPERAND	79 off On (VO18)
LED 8: TYPE	Self-Reset
LED 9: OPERAND	LINE PICKUP OP
LED 9: TYPE	Latched
LED 10: OPERAND	52A2 (a) Off(H7a)
LED 10: TYPE	Self-Reset
LED 11: OPERAND	52A2 (a) On(H7a)
LED 11: TYPE	Self-Reset
LED 12: OPERAND	FALLA RELE On(U7a)
LED 12: TYPE	Self-Reset
LED 13: OPERAND	67N On (VO32)
LED 13: TYPE	Latched
LED 14: OPERAND	51-51N On (VO33)
LED 14: TYPE	Latched
LED 15: OPERAND	50-50N On (VO34)
LED 15: TYPE	Latched
LED 16: OPERAND	AR 3-P/1 RIP
LED 16: TYPE	Self-Reset
LED 17: OPERAND	AR LO
LED 17: TYPE	Self-Reset
LED 18: OPERAND	POWER SWING UN/BLOCK
LED 18: TYPE	Self-Reset
LED 25: OPERAND	SELECTOR 1 POS 1
LED 25: TYPE	Self-Reset
LED 26: OPERAND	SELECTOR 1 POS 2
LED 26: TYPE	Self-Reset
LED 27: OPERAND	SETTING GROUP ACT 1
LED 27: TYPE	Self-Reset
LED 28: OPERAND	SETTING GROUP ACT 2
LED 28: TYPE	Self-Reset
LED 29: OPERAND	SETTING GROUP ACT 3
LED 29: TYPE	Self-Reset

USER-PROGRAMMABLE SELF TESTS

Battery Fail Function	Enabled

CONTROL PUSHBUTTONS

CPB 1: Function	Enabled
CPB 1: Events	Enabled

USER-DEFINABLE DISPLAYS

USER DISPLAY 1: Top Line	LINEA TINGUIRIRICA 2
USER DISPLAY 1: Bottom Line	SISTEMA 1
USER DISPLAY 1: Item 1	0
USER DISPLAY 1: Item 2	0
USER DISPLAY 1: Item 3	0
USER DISPLAY 1: Item 4	0
USER DISPLAY 1: Item 5	0

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VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

USER-DEFINABLE DISPLAYS (continued from last page)

USER DISPLAY 2: Top Line	COMMANDS
USER DISPLAY 2: Bottom Line	CLEAR RECORDS
USER DISPLAY 2: Item 1	0
USER DISPLAY 2: Item 2	0
USER DISPLAY 2: Item 3	0
USER DISPLAY 2: Item 4	0
USER DISPLAY 2: Item 5	0
USER DISPLAY 3: Top Line	IA IB IC
USER DISPLAY 3: Bottom Line	~ ~ ~
USER DISPLAY 3: Item 1	6144
USER DISPLAY 3: Item 2	6146
USER DISPLAY 3: Item 3	6148
USER DISPLAY 3: Item 4	0
USER DISPLAY 3: Item 5	0
USER DISPLAY 4: Top Line	EVENT RECORDS
USER DISPLAY 4: Bottom Line	
USER DISPLAY 4: Item 1	0
USER DISPLAY 4: Item 2	0
USER DISPLAY 4: Item 3	0
USER DISPLAY 4: Item 4	0
USER DISPLAY 4: Item 5	0
USER DISPLAY 5: Top Line	ACTUAL VALUES
USER DISPLAY 5: Bottom Line	RECORDS
USER DISPLAY 5: Item 1	0
USER DISPLAY 5: Item 2	0
USER DISPLAY 5: Item 3	0
USER DISPLAY 5: Item 4	0
USER DISPLAY 5: Item 5	0
Invoke and Scroll	ON

INSTALLATION

Relay Name	AJAA2 SISTEMA 1

SYSTEM SETUP

AC INPUTS

CURRENT

CT F1: Phase CT Primary	600 A
CT F1: Phase CT Secondary	5 A
CT F1: Ground CT Primary	600 A
CT F1: Ground CT Secondary	5 A

VOLTAGE

VT F5: Phase VT Connection	Wye
VT F5: Phase VT Secondary	63.5 V
VT F5: Phase VT Ratio	1400.00 :1
VT F5: Auxiliary VT Connection	Vbg
VT F5: Auxiliary VT Secondary	63.5 V
VT F5: Auxiliary VT Ratio	1400.00 :1

POWER SYSTEM

Nominal Frequency	50 Hz
Phase Rotation	ABC
Frequency And Phase Reference	LINEA (SRC 1)
Frequency Tracking Function	Enabled

SIGNAL SOURCES

SOURCE 1: Name	LINEA
SOURCE 1: Phase CT	F1
SOURCE 1: Ground CT	F1
SOURCE 1: Phase VT	F5
SOURCE 1: Auxiliary VT	None
SOURCE 2: Name	BARRA
SOURCE 2: Phase CT	None
SOURCE 2: Ground CT	None
SOURCE 2: Phase VT	None
SOURCE 2: Auxiliary VT	F5

BREAKERS

Breaker 1 Function	Enabled

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ORDER CODE: D60-G00-HCH-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

BREAKERS (continued from last page)

Breaker 1 Push Button Control	Disabled
Breaker 1 Name	52A2
Breaker 1 Mode	3-Pole
Breaker 1 Open	OFF
Breaker 1 Close	OFF
Breaker 1 Phase A/3-Pole	52A2 (a) On(H7a)
Breaker 1 Phase B	OFF
Breaker 1 Phase C	OFF
Breaker 1 External Alarm	OFF
Breaker 1 Alarm Delay	0.000 s
Breaker 1 Manual Close Recal Time	0.000 s
Breaker 1 Out Of Service	OFF

FLEXLOGIC

FLEXLOGIC EQUATION EDITOR

FlexLogic Entry 1	POWER SWING UN/BLOCK
FlexLogic Entry 2	SRC1 VT FUSE FAIL OP
FlexLogic Entry 3	OR(2)
FlexLogic Entry 4	= BLQ Zonas PH (VO1)
FlexLogic Entry 5	PH DIST Z1 OP
FlexLogic Entry 6	PH DIST Z2 OP
FlexLogic Entry 7	PH DIST Z3 OP
FlexLogic Entry 8	PH DIST Z4 OP
FlexLogic Entry 9	GND DIST Z1 OP
FlexLogic Entry 10	GND DIST Z2 OP
FlexLogic Entry 11	GND DIST Z3 OP
FlexLogic Entry 12	GND DIST Z4 OP
FlexLogic Entry 13	PHASE TOC1 OP
FlexLogic Entry 14	NEUTRAL TOC1 OP
FlexLogic Entry 15	PHASE TOC2 OP
FlexLogic Entry 16	NEUTRAL TOC2 OP
FlexLogic Entry 17	PHASE IOC1 OP
FlexLogic Entry 18	NEUTRAL IOC1 OP
FlexLogic Entry 19	HYBRID POTT OP
FlexLogic Entry 20	LINE PICKUP OP
FlexLogic Entry 21	OR(16)
FlexLogic Entry 22	PH DIST Z5 OP
FlexLogic Entry 23	GND DIST Z5 OP
FlexLogic Entry 24	POTT OP 2T On (VO50)
FlexLogic Entry 25	OR(3)
FlexLogic Entry 26	OR(2)
FlexLogic Entry 27	= TRIP GRAL (VO2)
FlexLogic Entry 28	BLQ Zonas PH On (VO1)
FlexLogic Entry 29	TRIP GRAL On (VO2)
FlexLogic Entry 30	POWER SWING BLOCK
FlexLogic Entry 31	OR(3)
FlexLogic Entry 32	= OSCILOGRAFIA (VO3)
FlexLogic Entry 33	PH DIST Z1 PKP
FlexLogic Entry 34	GND DIST Z1 PKP
FlexLogic Entry 35	PH DIST Z2 PKP
FlexLogic Entry 36	GND DIST Z2 PKP
FlexLogic Entry 37	OR(4)
FlexLogic Entry 38	= pkp Z1o z2 (VO4)
FlexLogic Entry 39	AR CLOSE BKR 1
FlexLogic Entry 40	SYNC 1 CLS OP
FlexLogic Entry 41	AND(2)
FlexLogic Entry 42	= ORD. CIERRE (VO6)
FlexLogic Entry 43	AR LO
FlexLogic Entry 44	TIMER 1
FlexLogic Entry 45	= RESET 79 (VO10)
FlexLogic Entry 46	GND DIST Z1 OP
FlexLogic Entry 47	PH DIST Z1 OP
FlexLogic Entry 48	OR(2)
FlexLogic Entry 49	= OPERA ZONA 1 (VO12)
FlexLogic Entry 50	GND DIST Z2 OP
FlexLogic Entry 51	PH DIST Z2 OP
FlexLogic Entry 52	OR(2)
FlexLogic Entry 53	= OPERA ZONA 2 (VO13)
FlexLogic Entry 54	PH DIST Z3 OP

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ORDER CODE: D60-G00-HCH-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

FLEXLOGIC EQUATION EDITOR (continued from last page)

FlexLogic Entry 55	GND DIST Z3 OP
FlexLogic Entry 56	OR(2)
FlexLogic Entry 57	= OPERA ZONA 3 (VO14)
FlexLogic Entry 58	PH DIST Z4 OP
FlexLogic Entry 59	GND DIST Z4 OP
FlexLogic Entry 60	OR(2)
FlexLogic Entry 61	= OPERA ZONA 4 (VO15)
FlexLogic Entry 62	PH DIST Z5 OP
FlexLogic Entry 63	GND DIST Z5 OP
FlexLogic Entry 64	OR(2)
FlexLogic Entry 65	= OPERA ZONA 5 (VO16)
FlexLogic Entry 66	79 conectado On(H7c)
FlexLogic Entry 67	SELECTOR 1 POS 1
FlexLogic Entry 68	AND(2)
FlexLogic Entry 69	= 79 on (VO17)
FlexLogic Entry 70	79 on On (VO17)
FlexLogic Entry 71	NOT
FlexLogic Entry 72	= 79 off (VO18)
FlexLogic Entry 73	PH DIST Z1 PKP
FlexLogic Entry 74	PH DIST Z2 PKP
FlexLogic Entry 75	PH DIST Z3 PKP
FlexLogic Entry 76	PH DIST Z4 PKP
FlexLogic Entry 77	PH DIST Z5 PKP
FlexLogic Entry 78	GND DIST Z1 PKP
FlexLogic Entry 79	GND DIST Z2 PKP
FlexLogic Entry 80	GND DIST Z3 PKP
FlexLogic Entry 81	GND DIST Z4 PKP
FlexLogic Entry 82	GND DIST Z5 PKP
FlexLogic Entry 83	PHASE TOC1 PKP
FlexLogic Entry 84	NEUTRAL TOC1 PKP
FlexLogic Entry 85	LINE PICKUP PKP
FlexLogic Entry 86	OR(13)
FlexLogic Entry 87	= reset led (VO19)
FlexLogic Entry 88	ANY MAJOR ERROR
FlexLogic Entry 89	DSP ERROR
FlexLogic Entry 90	EEPROM DATA ERROR
FlexLogic Entry 91	BATTERY FAIL
FlexLogic Entry 92	NOR(4)
FlexLogic Entry 93	= FALLA RELE (VO21)
FlexLogic Entry 94	Rx RANCAGUA On(H8c)
FlexLogic Entry 95	= RECEP ACELER (VO22)
FlexLogic Entry 96	PHASE TOC1 OP
FlexLogic Entry 97	NEUTRAL TOC1 OP
FlexLogic Entry 98	OR(2)
FlexLogic Entry 99	= 67-67N (VO27)
FlexLogic Entry 100	PHASE TOC2 OP
FlexLogic Entry 101	NEUTRAL TOC2 OP
FlexLogic Entry 102	OR(2)
FlexLogic Entry 103	= 51-51N (VO28)
FlexLogic Entry 104	PHASE IOC1 OP C
FlexLogic Entry 105	NEUTRAL IOC1 OP
FlexLogic Entry 106	OR(2)
FlexLogic Entry 107	= 50-50N (VO29)
FlexLogic Entry 108	PH DIST Z2 OP
FlexLogic Entry 109	GND DIST Z2 OP
FlexLogic Entry 110	OR(2)
FlexLogic Entry 111	Rx RANCAGUA On(H8c)
FlexLogic Entry 112	AND(2)
FlexLogic Entry 113	PH DIST Z1 OP
FlexLogic Entry 114	GND DIST Z1 OP
FlexLogic Entry 115	OR(2)
FlexLogic Entry 116	OR(2)
FlexLogic Entry 117	= Partida 79 (VO30)
FlexLogic Entry 118	FALLA RELE On (VO21)
FlexLogic Entry 119	SELECTOR 1 POS 1
FlexLogic Entry 120	OR(2)
FlexLogic Entry 121	= Control 79S2 (VO31)
FlexLogic Entry 122	NEG SEQ DIR OC1 REV
FlexLogic Entry 123	SRC1 VT FUSE FAIL OP

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FLEXLOGIC EQUATION EDITOR (continued from last page)

FlexLogic Entry 124	NOT
FlexLogic Entry 125	AND(2)
FlexLogic Entry 126	= BL-NTCO-NIOC (VO7)
FlexLogic Entry 127	NEUTRAL IOC1 OP
FlexLogic Entry 128	NEUTRAL TOC1 OP
FlexLogic Entry 129	OR(2)
FlexLogic Entry 130	NTRL DIR OC1 FWD
FlexLogic Entry 131	AND(2)
FlexLogic Entry 132	= 67N (VO32)
FlexLogic Entry 133	NEUTRAL TOC1 OP
FlexLogic Entry 134	SRC1 VT FUSE FAIL OP
FlexLogic Entry 135	AND(2)
FlexLogic Entry 136	PHASE TOC1 OP
FlexLogic Entry 137	OR(2)
FlexLogic Entry 138	= 51-51N (VO33)
FlexLogic Entry 139	NEUTRAL IOC1 OP
FlexLogic Entry 140	SRC1 VT FUSE FAIL OP
FlexLogic Entry 141	AND(2)
FlexLogic Entry 142	PHASE IOC1 OP
FlexLogic Entry 143	OR(2)
FlexLogic Entry 144	= 50-50N (VO34)
FlexLogic Entry 145	Rx TINGUI On(W1a)
FlexLogic Entry 146	Rx RANCAGUA On(H8c)
FlexLogic Entry 147	SETTING GROUP ACT 1
FlexLogic Entry 148	AND(3)
FlexLogic Entry 149	= RECEPCION 3T (VO36)
FlexLogic Entry 150	Rx RANCAGUA On(H8c)
FlexLogic Entry 151	SETTING GROUP ACT 2
FlexLogic Entry 152	AND(2)
FlexLogic Entry 153	= RECEPCION 2T (VO37)
FlexLogic Entry 154	RECEPCION 3T On (VO36)
FlexLogic Entry 155	RECEPCION 2T On (VO37)
FlexLogic Entry 156	OR(2)
FlexLogic Entry 157	= RECEPCION (VO41)
FlexLogic Entry 158	HYBRID POTT TX1
FlexLogic Entry 159	SETTING GROUP ACT 1
FlexLogic Entry 160	AND(2)
FlexLogic Entry 161	POTT TX1
FlexLogic Entry 162	SETTING GROUP ACT 2
FlexLogic Entry 163	AND(2)
FlexLogic Entry 164	OR(2)
FlexLogic Entry 165	= Tx RANCAGUA (VO44)
FlexLogic Entry 166	HYBRID POTT TX1
FlexLogic Entry 167	SETTING GROUP ACT 1
FlexLogic Entry 168	AND(2)
FlexLogic Entry 169	= Tx TINGUI (VO45)
FlexLogic Entry 170	CHANGE GRP Off(W2a)
FlexLogic Entry 171	TIMER 4
FlexLogic Entry 172	= CAMBIO G1-G2 (VO47)
FlexLogic Entry 173	52A2 (a) Off(H7a)
FlexLogic Entry 174	RECEPCION 2T On (VO37)
FlexLogic Entry 175	AND(2)
FlexLogic Entry 176	= ECHO COND 2T (VO48)
FlexLogic Entry 177	POTT OP
FlexLogic Entry 178	SETTING GROUP ACT 2
FlexLogic Entry 179	AND(2)
FlexLogic Entry 180	= POTT OP 2T (VO50)
FlexLogic Entry 181	END

FLEXLOGIC TIMERS

Timer 1: Type	millisecond
Timer 1: Pickup Delay	0
Timer 1: Dropout Delay	0
Timer 4: Type	second
Timer 4: Pickup Delay	2
Timer 4: Dropout Delay	2

GROUPED ELEMENTS
GROUP 1

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TEXT COLOR

LINE PICKUP [GROUP 1]

Function	Enabled
Signal Source	LINEA (SRC 1)
Phase IOC Line Pickup	1.882 pu
UV Pickup	0.800 pu
Line End Open Pickup Delay	0.200 s
Line End Open Reset Delay	0.200 s
OV Pickup Delay	0.200 s
Autoreclose Coordination Bypass	Enabled
Autoreclose Coordination Pickup Delay	0.045 s
Autoreclose Coordination Reset Delay	0.005 s
Terminal Open	BREAKER 1 OPEN
AR Accelerate	OFF
Block	OFF
Target	Self-reset
Events	Enabled

DISTANCE

DISTANCE [GROUP 1]

Source	LINEA (SRC 1)
Memory Duration	10 cycles
Force Self-Polar	OFF
Force Mem-Polar	OFF

PHASE DISTANCE [GROUP 1]

PHASE DISTANCE Z1: Function	Enabled
PHASE DISTANCE Z1: Direction	Forward
PHASE DISTANCE Z1: Shape	Quad
PHASE DISTANCE Z1: Xfmr Vol Connection	None
PHASE DISTANCE Z1: Xfmr Curr Connection	None
PHASE DISTANCE Z1: Reach	1.86 ohms
PHASE DISTANCE Z1: RCA	90 deg
PHASE DISTANCE Z1: Rev Reach	0.02 ohms
PHASE DISTANCE Z1: Rev Reach RCA	79 deg
PHASE DISTANCE Z1: Comp Limit	90 deg
PHASE DISTANCE Z1: DIR RCA	49 deg
PHASE DISTANCE Z1: DIR Comp Limit	71 deg
PHASE DISTANCE Z1: Quad Right Blinder	1.86 ohms
PHASE DISTANCE Z1: Quad Right Blinder RCA	79 deg
PHASE DISTANCE Z1: Quad Left Blinder	1.86 ohms
PHASE DISTANCE Z1: Quad Left Blinder RCA	79 deg
PHASE DISTANCE Z1: Supervision	0.100 pu
PHASE DISTANCE Z1: Volt Level	0.000 pu
PHASE DISTANCE Z1: Delay	0.000 s
PHASE DISTANCE Z1: Block	BLQ Zonas PH On (VO1)
PHASE DISTANCE Z1: Target	Self-reset
PHASE DISTANCE Z1: Events	Enabled
PHASE DISTANCE Z2: Function	Enabled
PHASE DISTANCE Z2: Direction	Forward
PHASE DISTANCE Z2: Shape	Quad
PHASE DISTANCE Z2: Xfmr Vol Connection	None
PHASE DISTANCE Z2: Xfmr Curr Connection	None
PHASE DISTANCE Z2: Reach	8.50 ohms
PHASE DISTANCE Z2: RCA	90 deg
PHASE DISTANCE Z2: Rev Reach	0.02 ohms
PHASE DISTANCE Z2: Rev Reach RCA	79 deg
PHASE DISTANCE Z2: Comp Limit	90 deg
PHASE DISTANCE Z2: DIR RCA	49 deg
PHASE DISTANCE Z2: DIR Comp Limit	71 deg
PHASE DISTANCE Z2: Quad Right Blinder	8.00 ohms
PHASE DISTANCE Z2: Quad Right Blinder RCA	79 deg
PHASE DISTANCE Z2: Quad Left Blinder	8.00 ohms
PHASE DISTANCE Z2: Quad Left Blinder RCA	79 deg
PHASE DISTANCE Z2: Supervision	0.100 pu
PHASE DISTANCE Z2: Volt Level	0.000 pu
PHASE DISTANCE Z2: Delay	65.535 s
PHASE DISTANCE Z2: Block	BLQ Zonas PH On (VO1)
PHASE DISTANCE Z2: Target	Self-reset
PHASE DISTANCE Z2: Events	Enabled
PHASE DISTANCE Z3: Function	Enabled

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TEXT COLOR

PHASE DISTANCE [GROUP 1] (continued from last page)

PHASE DISTANCE Z3: Direction	Forward
PHASE DISTANCE Z3: Shape	Quad
PHASE DISTANCE Z3: Xfmr Vol Connection	None
PHASE DISTANCE Z3: Xfmr Curr Connection	None
PHASE DISTANCE Z3: Reach	4.26 ohms
PHASE DISTANCE Z3: RCA	90 deg
PHASE DISTANCE Z3: Rev Reach	0.02 ohms
PHASE DISTANCE Z3: Rev Reach RCA	79 deg
PHASE DISTANCE Z3: Comp Limit	90 deg
PHASE DISTANCE Z3: DIR RCA	49 deg
PHASE DISTANCE Z3: DIR Comp Limit	71 deg
PHASE DISTANCE Z3: Quad Right Blinder	4.26 ohms
PHASE DISTANCE Z3: Quad Right Blinder RCA	79 deg
PHASE DISTANCE Z3: Quad Left Blinder	4.26 ohms
PHASE DISTANCE Z3: Quad Left Blinder RCA	79 deg
PHASE DISTANCE Z3: Supervision	0.100 pu
PHASE DISTANCE Z3: Volt Level	0.000 pu
PHASE DISTANCE Z3: Delay	0.600 s
PHASE DISTANCE Z3: Block	BLQ Zonas PH On (VO1)
PHASE DISTANCE Z3: Target	Self-reset
PHASE DISTANCE Z3: Events	Enabled
PHASE DISTANCE Z4: Function	Enabled
PHASE DISTANCE Z4: Direction	Reverse
PHASE DISTANCE Z4: Shape	Quad
PHASE DISTANCE Z4: Xfmr Vol Connection	None
PHASE DISTANCE Z4: Xfmr Curr Connection	None
PHASE DISTANCE Z4: Reach	6.00 ohms
PHASE DISTANCE Z4: RCA	90 deg
PHASE DISTANCE Z4: Rev Reach	0.02 ohms
PHASE DISTANCE Z4: Rev Reach RCA	79 deg
PHASE DISTANCE Z4: Comp Limit	90 deg
PHASE DISTANCE Z4: DIR RCA	49 deg
PHASE DISTANCE Z4: DIR Comp Limit	71 deg
PHASE DISTANCE Z4: Quad Right Blinder	6.00 ohms
PHASE DISTANCE Z4: Quad Right Blinder RCA	79 deg
PHASE DISTANCE Z4: Quad Left Blinder	6.00 ohms
PHASE DISTANCE Z4: Quad Left Blinder RCA	79 deg
PHASE DISTANCE Z4: Supervision	0.100 pu
PHASE DISTANCE Z4: Volt Level	0.000 pu
PHASE DISTANCE Z4: Delay	2.500 s
PHASE DISTANCE Z4: Block	BLQ Zonas PH On (VO1)
PHASE DISTANCE Z4: Target	Self-reset
PHASE DISTANCE Z4: Events	Enabled
PHASE DISTANCE Z5: Function	Enabled
PHASE DISTANCE Z5: Direction	Forward
PHASE DISTANCE Z5: Shape	Quad
PHASE DISTANCE Z5: Xfmr Vol Connection	None
PHASE DISTANCE Z5: Xfmr Curr Connection	None
PHASE DISTANCE Z5: Reach	6.50 ohms
PHASE DISTANCE Z5: RCA	90 deg
PHASE DISTANCE Z5: Rev Reach	0.02 ohms
PHASE DISTANCE Z5: Rev Reach RCA	79 deg
PHASE DISTANCE Z5: Comp Limit	90 deg
PHASE DISTANCE Z5: DIR RCA	49 deg
PHASE DISTANCE Z5: DIR Comp Limit	71 deg
PHASE DISTANCE Z5: Quad Right Blinder	6.50 ohms
PHASE DISTANCE Z5: Quad Right Blinder RCA	79 deg
PHASE DISTANCE Z5: Quad Left Blinder	6.50 ohms
PHASE DISTANCE Z5: Quad Left Blinder RCA	79 deg
PHASE DISTANCE Z5: Supervision	0.100 pu
PHASE DISTANCE Z5: Volt Level	0.000 pu
PHASE DISTANCE Z5: Delay	1.500 s
PHASE DISTANCE Z5: Block	BLQ Zonas PH On (VO1)
PHASE DISTANCE Z5: Target	Self-reset
PHASE DISTANCE Z5: Events	Enabled

GROUND DISTANCE [GROUP 1]

GROUND DISTANCE Z1: Function	Enabled
GROUND DISTANCE Z1: Direction	Forward

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TEXT COLOR

GROUND DISTANCE [GROUP 1] (continued from last page)

GROUND DISTANCE Z1: Shape	Quad
GROUND DISTANCE Z1: Z0/Z1 Mag	3.43
GROUND DISTANCE Z1: Z0/Z1 Ang	2 deg
GROUND DISTANCE Z1: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z1: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z1: Reach	1.86 ohms
GROUND DISTANCE Z1: RCA	90 deg
GROUND DISTANCE Z1: Rev Reach	0.02 ohms
GROUND DISTANCE Z1: Rev Reach RCA	79 deg
GROUND DISTANCE Z1: POL Current	Zero-seq
GROUND DISTANCE Z1: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z1: Comp Limit	90 deg
GROUND DISTANCE Z1: DIR RCA	49 deg
GROUND DISTANCE Z1: DIR Comp Limit	71 deg
GROUND DISTANCE Z1: Quad Right Blinder	1.86 ohms
GROUND DISTANCE Z1: Quad Right Blinder RCA	79 deg
GROUND DISTANCE Z1: Quad Left Blinder	1.86 ohms
GROUND DISTANCE Z1: Quad Left Blinder RCA	79 deg
GROUND DISTANCE Z1: Supervision	0.100 pu
GROUND DISTANCE Z1: Volt Level	0.000 pu
GROUND DISTANCE Z1: Delay	0.000 s
GROUND DISTANCE Z1: Block	SRC1 VT FUSE FAIL OP
GROUND DISTANCE Z1: Target	Self-reset
GROUND DISTANCE Z1: Events	Enabled
GROUND DISTANCE Z2: Function	Enabled
GROUND DISTANCE Z2: Direction	Forward
GROUND DISTANCE Z2: Shape	Quad
GROUND DISTANCE Z2: Z0/Z1 Mag	3.43
GROUND DISTANCE Z2: Z0/Z1 Ang	2 deg
GROUND DISTANCE Z2: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z2: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z2: Reach	8.50 ohms
GROUND DISTANCE Z2: RCA	90 deg
GROUND DISTANCE Z2: Rev Reach	0.02 ohms
GROUND DISTANCE Z2: Rev Reach RCA	79 deg
GROUND DISTANCE Z2: POL Current	Zero-seq
GROUND DISTANCE Z2: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z2: Comp Limit	90 deg
GROUND DISTANCE Z2: DIR RCA	49 deg
GROUND DISTANCE Z2: DIR Comp Limit	71 deg
GROUND DISTANCE Z2: Quad Right Blinder	8.00 ohms
GROUND DISTANCE Z2: Quad Right Blinder RCA	79 deg
GROUND DISTANCE Z2: Quad Left Blinder	8.00 ohms
GROUND DISTANCE Z2: Quad Left Blinder RCA	79 deg
GROUND DISTANCE Z2: Supervision	0.100 pu
GROUND DISTANCE Z2: Volt Level	0.000 pu
GROUND DISTANCE Z2: Delay	65.535 s
GROUND DISTANCE Z2: Block	SRC1 VT FUSE FAIL OP
GROUND DISTANCE Z2: Target	Self-reset
GROUND DISTANCE Z2: Events	Enabled
GROUND DISTANCE Z3: Function	Enabled
GROUND DISTANCE Z3: Direction	Forward
GROUND DISTANCE Z3: Shape	Quad
GROUND DISTANCE Z3: Z0/Z1 Mag	3.43
GROUND DISTANCE Z3: Z0/Z1 Ang	2 deg
GROUND DISTANCE Z3: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z3: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z3: Reach	4.26 ohms
GROUND DISTANCE Z3: RCA	90 deg
GROUND DISTANCE Z3: Rev Reach	0.02 ohms
GROUND DISTANCE Z3: Rev Reach RCA	79 deg
GROUND DISTANCE Z3: POL Current	Zero-seq
GROUND DISTANCE Z3: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z3: Comp Limit	90 deg
GROUND DISTANCE Z3: DIR RCA	49 deg
GROUND DISTANCE Z3: DIR Comp Limit	71 deg
GROUND DISTANCE Z3: Quad Right Blinder	4.26 ohms
GROUND DISTANCE Z3: Quad Right Blinder RCA	79 deg
GROUND DISTANCE Z3: Quad Left Blinder	4.26 ohms

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GROUND DISTANCE [GROUP 1] (continued from last page)

GROUND DISTANCE Z3: Quad Left Blinder RCA	79 deg
GROUND DISTANCE Z3: Supervision	0.100 pu
GROUND DISTANCE Z3: Volt Level	0.000 pu
GROUND DISTANCE Z3: Delay	0.600 s
GROUND DISTANCE Z3: Block	SRC1 VT FUSE FAIL OP
GROUND DISTANCE Z3: Target	Self-reset
GROUND DISTANCE Z3: Events	Enabled
GROUND DISTANCE Z4: Function	Enabled
GROUND DISTANCE Z4: Direction	Reverse
GROUND DISTANCE Z4: Shape	Quad
GROUND DISTANCE Z4: Z0/Z1 Mag	3.43
GROUND DISTANCE Z4: Z0/Z1 Ang	2 deg
GROUND DISTANCE Z4: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z4: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z4: Reach	6.00 ohms
GROUND DISTANCE Z4: RCA	90 deg
GROUND DISTANCE Z4: Rev Reach	0.02 ohms
GROUND DISTANCE Z4: Rev Reach RCA	79 deg
GROUND DISTANCE Z4: POL Current	Zero-seq
GROUND DISTANCE Z4: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z4: Comp Limit	90 deg
GROUND DISTANCE Z4: DIR RCA	49 deg
GROUND DISTANCE Z4: DIR Comp Limit	71 deg
GROUND DISTANCE Z4: Quad Right Blinder	6.00 ohms
GROUND DISTANCE Z4: Quad Right Blinder RCA	79 deg
GROUND DISTANCE Z4: Quad Left Blinder	6.00 ohms
GROUND DISTANCE Z4: Quad Left Blinder RCA	79 deg
GROUND DISTANCE Z4: Supervision	0.100 pu
GROUND DISTANCE Z4: Volt Level	0.000 pu
GROUND DISTANCE Z4: Delay	2.500 s
GROUND DISTANCE Z4: Block	SRC1 VT FUSE FAIL OP
GROUND DISTANCE Z4: Target	Self-reset
GROUND DISTANCE Z4: Events	Enabled
GROUND DISTANCE Z5: Function	Enabled
GROUND DISTANCE Z5: Direction	Forward
GROUND DISTANCE Z5: Shape	Quad
GROUND DISTANCE Z5: Z0/Z1 Mag	3.43
GROUND DISTANCE Z5: Z0/Z1 Ang	2 deg
GROUND DISTANCE Z5: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z5: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z5: Reach	6.50 ohms
GROUND DISTANCE Z5: RCA	90 deg
GROUND DISTANCE Z5: Rev Reach	0.02 ohms
GROUND DISTANCE Z5: Rev Reach RCA	79 deg
GROUND DISTANCE Z5: POL Current	Zero-seq
GROUND DISTANCE Z5: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z5: Comp Limit	90 deg
GROUND DISTANCE Z5: DIR RCA	49 deg
GROUND DISTANCE Z5: DIR Comp Limit	71 deg
GROUND DISTANCE Z5: Quad Right Blinder	13.00 ohms
GROUND DISTANCE Z5: Quad Right Blinder RCA	79 deg
GROUND DISTANCE Z5: Quad Left Blinder	13.00 ohms
GROUND DISTANCE Z5: Quad Left Blinder RCA	79 deg
GROUND DISTANCE Z5: Supervision	0.100 pu
GROUND DISTANCE Z5: Volt Level	0.000 pu
GROUND DISTANCE Z5: Delay	1.500 s
GROUND DISTANCE Z5: Block	SRC1 VT FUSE FAIL OP
GROUND DISTANCE Z5: Target	Self-reset
GROUND DISTANCE Z5: Events	Enabled

POWER SWING DETECT [GROUP 1]

Function	Enabled
Source	LINEA (SRC 1)
Shape	Quad Shape
Mode	Two Step
Supv	0.200 pu
Fwd Reach	17.50 ohms
Quad Fwd Mid	18.20 ohms
Quad Fwd Out	18.20 ohms

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POWER SWING DETECT [GROUP 1] (continued from last page)

Fwd Rca	79 deg
Rev Reach	8.00 ohms
Quad Rev Mid	8.70 ohms
Quad Rev Out	8.70 ohms
Rev Rca	79 deg
Outer Limit Angle	120 deg
Middle Limit Angle	72 deg
Inner Limit Angle	72 deg
Outer Rgt Bld	15.20 ohms
Outer Lft Bld	12.20 ohms
Midle Rgt Bld	100.00 ohms
Midle Lft Bld	100.00 ohms
Inner Rgt Bld	14.50 ohms
Inner Lft Bld	11.50 ohms
Delay 1 Pickup	0.002 s
Delay 1 Reset	0.050 s
Delay 2 Pickup	0.017 s
Delay 3 Pickup	0.009 s
Delay 4 Pickup	0.017 s
Seal-In Delay	0.400 s
Trip Mode	Early
Block	NEUTRAL TOC1 PKP
Target	Self-reset
Event	Disabled

LOAD ENCROACHMENT [GROUP 1]

Function	Enabled
Source	LINEA (SRC 1)
Min Volt	0.800 pu
Reach	9.14 ohms
Angle	35 deg
Pickup Delay	0.000 s
Reset Delay	0.000 s
Block	OFF
Target	Self-reset
Events	Enabled

PHASE CURRENT

PHASE TOC [GROUP 1]

PHASE TOC1: Function	Enabled
PHASE TOC1: Signal Source	LINEA (SRC 1)
PHASE TOC1: Input	Phasor
PHASE TOC1: Pickup	1.200 pu
PHASE TOC1: Curve	IEC Curve A
PHASE TOC1: TD Multiplier	0.10
PHASE TOC1: Reset	Instantaneous
PHASE TOC1: Voltage Restraint	Disabled
PHASE TOC1: Block A	PH DIR1 BLK
PHASE TOC1: Block B	PH DIR1 BLK
PHASE TOC1: Block C	PH DIR1 BLK
PHASE TOC1: Target	Self-reset
PHASE TOC1: Events	Enabled

PHASE DIRECTIONAL [GROUP 1]

PHASE DIR1: Function	Enabled
PHASE DIR1: Source	LINEA (SRC 1)
PHASE DIR1: Block	OFF
PHASE DIR1: ECA	45 deg
PHASE DIR1: Pol V Threshold	0.700 pu
PHASE DIR1: Block when V Mem Exp	No
PHASE DIR1: Target	Self-reset
PHASE DIR1: Events	Enabled

NEUTRAL CURRENT

NEUTRAL TOC [GROUP 1]

NEUTRAL TOC1: Function	Enabled
NEUTRAL TOC1: Source	LINEA (SRC 1)
NEUTRAL TOC1: Input	Phasor
NEUTRAL TOC1: Pickup	0.082 pu

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TEXT COLOR

NEUTRAL TOC [GROUP 1] (continued from last page)

NEUTRAL TOC1: Curve	IEC Curve A
NEUTRAL TOC1: TD Multiplier	0.30
NEUTRAL TOC1: Reset	Instantaneous
NEUTRAL TOC1: Block	BL-NTCO-NIOC On (VO7)
NEUTRAL TOC1: Target	Self-reset
NEUTRAL TOC1: Events	Enabled

NEGATIVE SEQUENCE CURRENT

NEGATIVE SEQUENCE DIRECTIONAL OC [GROUP 1]

NEGATIVE SEQ DIR OC1: Function	Enabled
NEGATIVE SEQ DIR OC1: Source	LINEA (SRC 1)
NEGATIVE SEQ DIR OC1: Offset	0.00 ohms
NEGATIVE SEQ DIR OC1: Type	Neg Sequence
NEGATIVE SEQ DIR OC1: POS SEQ Restraint	0.000
NEGATIVE SEQ DIR OC1: Forward ECA	78 ° Lag
NEGATIVE SEQ DIR OC1: Forward Limit Angle	80 deg
NEGATIVE SEQ DIR OC1: Forward Pickup	0.08 pu
NEGATIVE SEQ DIR OC1: Reverse Limit Angle	80 deg
NEGATIVE SEQ DIR OC1: Reverse Pickup	0.08 pu
NEGATIVE SEQ DIR OC1: Block	SRC1 VT FUSE FAIL OP
NEGATIVE SEQ DIR OC1: Target	Self-reset
NEGATIVE SEQ DIR OC1: Events	Enabled

BREAKER FAILURE [GROUP 1]

BF1: Function	Enabled
BF1: Mode	3-Pole
BF1: Source	LINEA (SRC 1)
BF1: Current Supervision	Yes
BF1: Use Seal-In	Yes
BF1: Three Pole Initiate	TRIP 3-POLE
BF1: Block	OFF
BF1: Phase Current Supv Pickup	1.200 pu
BF1: Neutral Current Supv Pickup	0.082 pu
BF1: Use Timer 1	Yes
BF1: Timer 1 Pickup Delay	0.200 s
BF1: Use Timer 2	No
BF1: Timer 2 Pickup Delay	0.200 s
BF1: Use Timer 3	No
BF1: Timer 3 Pickup Delay	0.000 s
BF1: Breaker Pos1 Phase A/3P	52A2 (a) On(H7a)
BF1: Breaker Pos2 Phase A/3P	OFF
BF1: Breaker Test On	ON
BF1: Phase Current HiSet Pickup	1.200 pu
BF1: Neutral Current HiSet Pickup	0.082 pu
BF1: Phase Current LoSet Pickup	1.200 pu
BF1: Neutral Current LoSet Pickup	0.082 pu
BF1: LoSet Time Delay	0.000 s
BF1: Trip Dropout Delay	0.000 s
BF1: Target	Self-reset
BF1: Events	Enabled
BF1: Phase A Initiate	OFF
BF1: Phase B Initiate	OFF
BF1: Phase C Initiate	OFF
BF1: Breaker Pos1 Phase B	OFF
BF1: Breaker Pos1 Phase C	OFF
BF1: Breaker Pos2 Phase B	OFF
BF1: Breaker Pos2 Phase C	OFF

GROUP 2

LINE PICKUP [GROUP 2]

Function	Enabled
Signal Source	LINEA (SRC 1)
Phase IOC Line Pickup	2.500 pu
UV Pickup	0.800 pu
Line End Open Pickup Delay	0.200 s
Line End Open Reset Delay	0.200 s
OV Pickup Delay	0.200 s
Autoreclose Coordination Bypass	Disabled
Autoreclose Coordination Pickup Delay	0.045 s

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DESCRIPTION: (NONE)
TEXT COLOR

LINE PICKUP [GROUP 2] (continued from last page)

Autoreclose Coordination Reset Delay	0.005 s
Terminal Open	BREAKER 1 OPEN
AR Accelerate	OFF
Block	OFF
Target	Self-reset
Events	Enabled

DISTANCE

DISTANCE [GROUP 2]

Source	LINEA (SRC 1)
Memory Duration	10 cycles
Force Self-Polar	OFF
Force Mem-Polar	OFF

PHASE DISTANCE [GROUP 2]

PHASE DISTANCE Z1: Function	Enabled
PHASE DISTANCE Z1: Direction	Forward
PHASE DISTANCE Z1: Shape	Quad
PHASE DISTANCE Z1: Xfmr Vol Connection	None
PHASE DISTANCE Z1: Xfmr Curr Connection	None
PHASE DISTANCE Z1: Reach	1.72 ohms
PHASE DISTANCE Z1: RCA	90 deg
PHASE DISTANCE Z1: Rev Reach	1.72 ohms
PHASE DISTANCE Z1: Rev Reach RCA	79 deg
PHASE DISTANCE Z1: Comp Limit	90 deg
PHASE DISTANCE Z1: DIR RCA	45 deg
PHASE DISTANCE Z1: DIR Comp Limit	79 deg
PHASE DISTANCE Z1: Quad Right Blinder	1.72 ohms
PHASE DISTANCE Z1: Quad Right Blinder RCA	79 deg
PHASE DISTANCE Z1: Quad Left Blinder	10.00 ohms
PHASE DISTANCE Z1: Quad Left Blinder RCA	79 deg
PHASE DISTANCE Z1: Supervision	0.200 pu
PHASE DISTANCE Z1: Volt Level	0.000 pu
PHASE DISTANCE Z1: Delay	0.000 s
PHASE DISTANCE Z1: Block	BLQ Zonas PH On (VO1)
PHASE DISTANCE Z1: Target	Self-reset
PHASE DISTANCE Z1: Events	Enabled
PHASE DISTANCE Z2: Function	Enabled
PHASE DISTANCE Z2: Direction	Forward
PHASE DISTANCE Z2: Shape	Quad
PHASE DISTANCE Z2: Xfmr Vol Connection	None
PHASE DISTANCE Z2: Xfmr Curr Connection	None
PHASE DISTANCE Z2: Reach	3.20 ohms
PHASE DISTANCE Z2: RCA	90 deg
PHASE DISTANCE Z2: Rev Reach	3.20 ohms
PHASE DISTANCE Z2: Rev Reach RCA	79 deg
PHASE DISTANCE Z2: Comp Limit	90 deg
PHASE DISTANCE Z2: DIR RCA	45 deg
PHASE DISTANCE Z2: DIR Comp Limit	79 deg
PHASE DISTANCE Z2: Quad Right Blinder	3.20 ohms
PHASE DISTANCE Z2: Quad Right Blinder RCA	79 deg
PHASE DISTANCE Z2: Quad Left Blinder	10.00 ohms
PHASE DISTANCE Z2: Quad Left Blinder RCA	79 deg
PHASE DISTANCE Z2: Supervision	0.200 pu
PHASE DISTANCE Z2: Volt Level	0.000 pu
PHASE DISTANCE Z2: Delay	0.400 s
PHASE DISTANCE Z2: Block	BLQ Zonas PH On (VO1)
PHASE DISTANCE Z2: Target	Self-reset
PHASE DISTANCE Z2: Events	Enabled
PHASE DISTANCE Z3: Function	Enabled
PHASE DISTANCE Z3: Direction	Forward
PHASE DISTANCE Z3: Shape	Quad
PHASE DISTANCE Z3: Xfmr Vol Connection	None
PHASE DISTANCE Z3: Xfmr Curr Connection	None
PHASE DISTANCE Z3: Reach	4.40 ohms
PHASE DISTANCE Z3: RCA	90 deg
PHASE DISTANCE Z3: Rev Reach	4.40 ohms
PHASE DISTANCE Z3: Rev Reach RCA	79 deg
PHASE DISTANCE Z3: Comp Limit	90 deg

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DEVICE DEFINITION
FILES
ORDER CODE: D60-G00-HCH-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

PHASE DISTANCE [GROUP 2] (continued from last page)

PHASE DISTANCE Z3: DIR RCA	45 deg
PHASE DISTANCE Z3: DIR Comp Limit	79 deg
PHASE DISTANCE Z3: Quad Right Blinder	4.40 ohms
PHASE DISTANCE Z3: Quad Right Blinder RCA	79 deg
PHASE DISTANCE Z3: Quad Left Blinder	10.00 ohms
PHASE DISTANCE Z3: Quad Left Blinder RCA	79 deg
PHASE DISTANCE Z3: Supervision	0.200 pu
PHASE DISTANCE Z3: Volt Level	0.000 pu
PHASE DISTANCE Z3: Delay	2.000 s
PHASE DISTANCE Z3: Block	BLQ Zonas PH On (VO1)
PHASE DISTANCE Z3: Target	Self-reset
PHASE DISTANCE Z3: Events	Enabled
PHASE DISTANCE Z4: Function	Enabled
PHASE DISTANCE Z4: Direction	Reverse
PHASE DISTANCE Z4: Shape	Quad
PHASE DISTANCE Z4: Xfmr Vol Connection	None
PHASE DISTANCE Z4: Xfmr Curr Connection	None
PHASE DISTANCE Z4: Reach	0.80 ohms
PHASE DISTANCE Z4: RCA	90 deg
PHASE DISTANCE Z4: Rev Reach	0.80 ohms
PHASE DISTANCE Z4: Rev Reach RCA	79 deg
PHASE DISTANCE Z4: Comp Limit	90 deg
PHASE DISTANCE Z4: DIR RCA	45 deg
PHASE DISTANCE Z4: DIR Comp Limit	79 deg
PHASE DISTANCE Z4: Quad Right Blinder	0.80 ohms
PHASE DISTANCE Z4: Quad Right Blinder RCA	79 deg
PHASE DISTANCE Z4: Quad Left Blinder	10.00 ohms
PHASE DISTANCE Z4: Quad Left Blinder RCA	79 deg
PHASE DISTANCE Z4: Supervision	0.200 pu
PHASE DISTANCE Z4: Volt Level	0.000 pu
PHASE DISTANCE Z4: Delay	2.000 s
PHASE DISTANCE Z4: Block	BLQ Zonas PH On (VO1)
PHASE DISTANCE Z4: Target	Self-reset
PHASE DISTANCE Z4: Events	Enabled

GROUND DISTANCE [GROUP 2]

GROUND DISTANCE Z1: Function	Enabled
GROUND DISTANCE Z1: Direction	Forward
GROUND DISTANCE Z1: Shape	Quad
GROUND DISTANCE Z1: Z0/Z1 Mag	3.36
GROUND DISTANCE Z1: Z0/Z1 Ang	1 deg
GROUND DISTANCE Z1: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z1: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z1: Reach	1.72 ohms
GROUND DISTANCE Z1: RCA	90 deg
GROUND DISTANCE Z1: Rev Reach	1.72 ohms
GROUND DISTANCE Z1: Rev Reach RCA	79 deg
GROUND DISTANCE Z1: POL Current	Zero-seq
GROUND DISTANCE Z1: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z1: Comp Limit	90 deg
GROUND DISTANCE Z1: DIR RCA	45 deg
GROUND DISTANCE Z1: DIR Comp Limit	79 deg
GROUND DISTANCE Z1: Quad Right Blinder	3.44 ohms
GROUND DISTANCE Z1: Quad Right Blinder RCA	79 deg
GROUND DISTANCE Z1: Quad Left Blinder	3.44 ohms
GROUND DISTANCE Z1: Quad Left Blinder RCA	79 deg
GROUND DISTANCE Z1: Supervision	0.200 pu
GROUND DISTANCE Z1: Volt Level	0.000 pu
GROUND DISTANCE Z1: Delay	0.000 s
GROUND DISTANCE Z1: Block	SRC1 VT FUSE FAIL OP
GROUND DISTANCE Z1: Target	Self-reset
GROUND DISTANCE Z1: Events	Enabled
GROUND DISTANCE Z2: Function	Enabled
GROUND DISTANCE Z2: Direction	Forward
GROUND DISTANCE Z2: Shape	Quad
GROUND DISTANCE Z2: Z0/Z1 Mag	3.36
GROUND DISTANCE Z2: Z0/Z1 Ang	1 deg
GROUND DISTANCE Z2: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z2: Z0M/Z1 Ang	0 deg

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ORDER CODE: D60-G00-HCH-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

GROUND DISTANCE [GROUP 2] (continued from last page)

GROUND DISTANCE Z2: Reach	3.20 ohms
GROUND DISTANCE Z2: RCA	90 deg
GROUND DISTANCE Z2: Rev Reach	3.20 ohms
GROUND DISTANCE Z2: Rev Reach RCA	79 deg
GROUND DISTANCE Z2: POL Current	Zero-seq
GROUND DISTANCE Z2: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z2: Comp Limit	90 deg
GROUND DISTANCE Z2: DIR RCA	45 deg
GROUND DISTANCE Z2: DIR Comp Limit	79 deg
GROUND DISTANCE Z2: Quad Right Blinder	6.40 ohms
GROUND DISTANCE Z2: Quad Right Blinder RCA	79 deg
GROUND DISTANCE Z2: Quad Left Blinder	6.40 ohms
GROUND DISTANCE Z2: Quad Left Blinder RCA	79 deg
GROUND DISTANCE Z2: Supervision	0.100 pu
GROUND DISTANCE Z2: Volt Level	0.000 pu
GROUND DISTANCE Z2: Delay	0.400 s
GROUND DISTANCE Z2: Block	SRC1 VT FUSE FAIL OP
GROUND DISTANCE Z2: Target	Self-reset
GROUND DISTANCE Z2: Events	Enabled
GROUND DISTANCE Z3: Function	Enabled
GROUND DISTANCE Z3: Direction	Forward
GROUND DISTANCE Z3: Shape	Quad
GROUND DISTANCE Z3: Z0/Z1 Mag	3.36
GROUND DISTANCE Z3: Z0/Z1 Ang	1 deg
GROUND DISTANCE Z3: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z3: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z3: Reach	4.40 ohms
GROUND DISTANCE Z3: RCA	90 deg
GROUND DISTANCE Z3: Rev Reach	4.40 ohms
GROUND DISTANCE Z3: Rev Reach RCA	79 deg
GROUND DISTANCE Z3: POL Current	Zero-seq
GROUND DISTANCE Z3: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z3: Comp Limit	90 deg
GROUND DISTANCE Z3: DIR RCA	45 deg
GROUND DISTANCE Z3: DIR Comp Limit	79 deg
GROUND DISTANCE Z3: Quad Right Blinder	9.40 ohms
GROUND DISTANCE Z3: Quad Right Blinder RCA	79 deg
GROUND DISTANCE Z3: Quad Left Blinder	9.40 ohms
GROUND DISTANCE Z3: Quad Left Blinder RCA	79 deg
GROUND DISTANCE Z3: Supervision	0.100 pu
GROUND DISTANCE Z3: Volt Level	0.000 pu
GROUND DISTANCE Z3: Delay	2.000 s
GROUND DISTANCE Z3: Block	SRC1 VT FUSE FAIL OP
GROUND DISTANCE Z3: Target	Self-reset
GROUND DISTANCE Z3: Events	Enabled
GROUND DISTANCE Z4: Function	Enabled
GROUND DISTANCE Z4: Direction	Reverse
GROUND DISTANCE Z4: Shape	Quad
GROUND DISTANCE Z4: Z0/Z1 Mag	3.36
GROUND DISTANCE Z4: Z0/Z1 Ang	1 deg
GROUND DISTANCE Z4: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z4: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z4: Reach	0.80 ohms
GROUND DISTANCE Z4: RCA	90 deg
GROUND DISTANCE Z4: Rev Reach	0.80 ohms
GROUND DISTANCE Z4: Rev Reach RCA	79 deg
GROUND DISTANCE Z4: POL Current	Zero-seq
GROUND DISTANCE Z4: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z4: Comp Limit	90 deg
GROUND DISTANCE Z4: DIR RCA	45 deg
GROUND DISTANCE Z4: DIR Comp Limit	79 deg
GROUND DISTANCE Z4: Quad Right Blinder	1.00 ohms
GROUND DISTANCE Z4: Quad Right Blinder RCA	79 deg
GROUND DISTANCE Z4: Quad Left Blinder	1.00 ohms
GROUND DISTANCE Z4: Quad Left Blinder RCA	79 deg
GROUND DISTANCE Z4: Supervision	0.100 pu
GROUND DISTANCE Z4: Volt Level	0.000 pu
GROUND DISTANCE Z4: Delay	2.000 s
GROUND DISTANCE Z4: Block	SRC1 VT FUSE FAIL OP

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VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

GROUND DISTANCE [GROUP 2] (continued from last page)

GROUND DISTANCE Z4: Target	Self-reset
GROUND DISTANCE Z4: Events	Enabled

POWER SWING DETECT [GROUP 2]

Function	Enabled
Source	LINEA (SRC 1)
Shape	Quad Shape
Mode	Two Step
Supv	0.200 pu
Fwd Reach	6.50 ohms
Quad Fwd Mid	60.00 ohms
Quad Fwd Out	8.50 ohms
Fwd Rca	79 deg
Rev Reach	3.50 ohms
Quad Rev Mid	60.00 ohms
Quad Rev Out	5.50 ohms
Rev Rca	90 deg
Outer Limit Angle	120 deg
Middle Limit Angle	90 deg
Inner Limit Angle	79 deg
Outer Rgt Bld	7.80 ohms
Outer Lft Bld	6.97 ohms
Midle Rgt Bld	100.00 ohms
Midle Lft Bld	100.00 ohms
Inner Rgt Bld	5.80 ohms
Inner Lft Bld	4.97 ohms
Delay 1 Pickup	0.001 s
Delay 1 Reset	0.050 s
Delay 2 Pickup	0.017 s
Delay 3 Pickup	0.009 s
Delay 4 Pickup	0.017 s
Seal-In Delay	0.400 s
Trip Mode	Delayed
Block	NEUTRAL TOC1 PKP
Target	Self-reset
Event	Disabled

PHASE CURRENT

PHASE TOC [GROUP 2]

PHASE TOC1: Function	Enabled
PHASE TOC1: Signal Source	LINEA (SRC 1)
PHASE TOC1: Input	Phasor
PHASE TOC1: Pickup	1.200 pu
PHASE TOC1: Curve	IEC Curve A
PHASE TOC1: TD Multiplier	0.22
PHASE TOC1: Reset	Instantaneous
PHASE TOC1: Voltage Restraint	Disabled
PHASE TOC1: Block A	PH DIR1 BLK
PHASE TOC1: Block B	PH DIR1 BLK
PHASE TOC1: Block C	PH DIR1 BLK
PHASE TOC1: Target	Self-reset
PHASE TOC1: Events	Enabled

PHASE IOC [GROUP 2]

PHASE IOC1: Function	Enabled
PHASE IOC1: Source	LINEA (SRC 1)
PHASE IOC1: Pickup	4.600 pu
PHASE IOC1: Delay	0.01 s
PHASE IOC1: Reset Delay	0.00 s
PHASE IOC1: Block A	SRC1 VT FUSE FAIL DPO
PHASE IOC1: Block B	SRC1 VT FUSE FAIL DPO
PHASE IOC1: Block C	SRC2 VT FUSE FAIL DPO
PHASE IOC1: Target	Self-reset
PHASE IOC1: Events	Enabled

NEUTRAL CURRENT

NEUTRAL TOC [GROUP 2]

NEUTRAL TOC1: Function	Enabled
NEUTRAL TOC1: Source	LINEA (SRC 1)

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VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

NEUTRAL TOC [GROUP 2] (continued from last page)

NEUTRAL TOC1: Input	Phasor
NEUTRAL TOC1: Pickup	0.480 pu
NEUTRAL TOC1: Curve	IEC Curve A
NEUTRAL TOC1: TD Multiplier	0.13
NEUTRAL TOC1: Reset	Instantaneous
NEUTRAL TOC1: Block	BL-NTCO-NIOC On (VO7)
NEUTRAL TOC1: Target	Self-reset
NEUTRAL TOC1: Events	Enabled

NEUTRAL IOC [GROUP 2]

NEUTRAL IOC1: Function	Enabled
NEUTRAL IOC1: Source	LINEA (SRC 1)
NEUTRAL IOC1: Pickup	3.000 pu
NEUTRAL IOC1: Delay	0.03 s
NEUTRAL IOC1: Reset Delay	0.00 s
NEUTRAL IOC1: Block	BL-NTCO-NIOC On (VO7)
NEUTRAL IOC1: Target	Self-reset
NEUTRAL IOC1: Events	Enabled

NEGATIVE SEQUENCE CURRENT

NEGATIVE SEQUENCE DIRECTIONAL OC [GROUP 2]

NEGATIVE SEQ DIR OC1: Function	Enabled
NEGATIVE SEQ DIR OC1: Source	LINEA (SRC 1)
NEGATIVE SEQ DIR OC1: Offset	0.00 ohms
NEGATIVE SEQ DIR OC1: Type	Neg Sequence
NEGATIVE SEQ DIR OC1: POS SEQ Restraint	0.000
NEGATIVE SEQ DIR OC1: Forward ECA	81 ° Lag
NEGATIVE SEQ DIR OC1: Forward Limit Angle	80 deg
NEGATIVE SEQ DIR OC1: Forward Pickup	0.10 pu
NEGATIVE SEQ DIR OC1: Reverse Limit Angle	81 deg
NEGATIVE SEQ DIR OC1: Reverse Pickup	0.10 pu
NEGATIVE SEQ DIR OC1: Block	SRC1 VT FUSE FAIL OP
NEGATIVE SEQ DIR OC1: Target	Self-reset
NEGATIVE SEQ DIR OC1: Events	Enabled

BREAKER FAILURE [GROUP 2]

BF1: Function	Enabled
BF1: Mode	3-Pole
BF1: Source	LINEA (SRC 1)
BF1: Current Supervision	Yes
BF1: Use Seal-In	No
BF1: Three Pole Initiate	TRIP 3-POLE
BF1: Block	OFF
BF1: Phase Current Supv Pickup	1.200 pu
BF1: Neutral Current Supv Pickup	0.480 pu
BF1: Use Timer 1	Yes
BF1: Timer 1 Pickup Delay	0.200 s
BF1: Use Timer 2	No
BF1: Timer 2 Pickup Delay	0.000 s
BF1: Use Timer 3	No
BF1: Timer 3 Pickup Delay	0.000 s
BF1: Breaker Pos1 Phase A/3P	52A2 (a) On(H7a)
BF1: Breaker Pos2 Phase A/3P	OFF
BF1: Breaker Test On	OFF
BF1: Phase Current HiSet Pickup	1.200 pu
BF1: Neutral Current HiSet Pickup	0.480 pu
BF1: Phase Current LoSet Pickup	1.200 pu
BF1: Neutral Current LoSet Pickup	0.480 pu
BF1: LoSet Time Delay	0.000 s
BF1: Trip Dropout Delay	0.000 s
BF1: Target	Self-reset
BF1: Events	Enabled
BF1: Phase A Initiate	OFF
BF1: Phase B Initiate	OFF
BF1: Phase C Initiate	OFF
BF1: Breaker Pos1 Phase B	OFF
BF1: Breaker Pos1 Phase C	OFF
BF1: Breaker Pos2 Phase B	OFF
BF1: Breaker Pos2 Phase C	OFF

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ORDER CODE: D60-G00-HCH-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

GROUP 3

LINE PICKUP [GROUP 3]

Function	Enabled
Signal Source	LINEA (SRC 1)
Phase IOC Line Pickup	2.500 pu
UV Pickup	0.800 pu
Line End Open Pickup Delay	0.200 s
Line End Open Reset Delay	0.200 s
OV Pickup Delay	0.200 s
Autoreclose Coordination Bypass	Disabled
Autoreclose Coordination Pickup Delay	0.045 s
Autoreclose Coordination Reset Delay	0.005 s
Terminal Open	BREAKER 1 OPEN
AR Accelerate	OFF
Block	OFF
Target	Self-reset
Events	Enabled

DISTANCE

DISTANCE [GROUP 3]

Source	LINEA (SRC 1)
Memory Duration	10 cycles
Force Self-Polar	OFF
Force Mem-Polar	OFF

PHASE DISTANCE [GROUP 3]

PHASE DISTANCE Z1: Function	Enabled
PHASE DISTANCE Z1: Direction	Forward
PHASE DISTANCE Z1: Shape	Quad
PHASE DISTANCE Z1: Xfmr Vol Connection	None
PHASE DISTANCE Z1: Xfmr Curr Connection	None
PHASE DISTANCE Z1: Reach	1.72 ohms
PHASE DISTANCE Z1: RCA	90 deg
PHASE DISTANCE Z1: Rev Reach	1.72 ohms
PHASE DISTANCE Z1: Rev Reach RCA	79 deg
PHASE DISTANCE Z1: Comp Limit	90 deg
PHASE DISTANCE Z1: DIR RCA	45 deg
PHASE DISTANCE Z1: DIR Comp Limit	79 deg
PHASE DISTANCE Z1: Quad Right Blinder	1.72 ohms
PHASE DISTANCE Z1: Quad Right Blinder RCA	79 deg
PHASE DISTANCE Z1: Quad Left Blinder	1.72 ohms
PHASE DISTANCE Z1: Quad Left Blinder RCA	79 deg
PHASE DISTANCE Z1: Supervision	0.200 pu
PHASE DISTANCE Z1: Volt Level	0.000 pu
PHASE DISTANCE Z1: Delay	0.000 s
PHASE DISTANCE Z1: Block	BLQ Zonas PH On (VO1)
PHASE DISTANCE Z1: Target	Self-reset
PHASE DISTANCE Z1: Events	Enabled
PHASE DISTANCE Z2: Function	Enabled
PHASE DISTANCE Z2: Direction	Forward
PHASE DISTANCE Z2: Shape	Quad
PHASE DISTANCE Z2: Xfmr Vol Connection	None
PHASE DISTANCE Z2: Xfmr Curr Connection	None
PHASE DISTANCE Z2: Reach	3.60 ohms
PHASE DISTANCE Z2: RCA	90 deg
PHASE DISTANCE Z2: Rev Reach	3.60 ohms
PHASE DISTANCE Z2: Rev Reach RCA	79 deg
PHASE DISTANCE Z2: Comp Limit	90 deg
PHASE DISTANCE Z2: DIR RCA	45 deg
PHASE DISTANCE Z2: DIR Comp Limit	79 deg
PHASE DISTANCE Z2: Quad Right Blinder	3.60 ohms
PHASE DISTANCE Z2: Quad Right Blinder RCA	79 deg
PHASE DISTANCE Z2: Quad Left Blinder	3.60 ohms
PHASE DISTANCE Z2: Quad Left Blinder RCA	79 deg
PHASE DISTANCE Z2: Supervision	0.200 pu
PHASE DISTANCE Z2: Volt Level	0.000 pu
PHASE DISTANCE Z2: Delay	0.600 s
PHASE DISTANCE Z2: Block	BLQ Zonas PH On (VO1)
PHASE DISTANCE Z2: Target	Self-reset

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ORDER CODE: D60-G00-HCH-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

PHASE DISTANCE [GROUP 3] (continued from last page)

PHASE DISTANCE Z2: Events	Enabled
PHASE DISTANCE Z3: Function	Enabled
PHASE DISTANCE Z3: Direction	Forward
PHASE DISTANCE Z3: Shape	Quad
PHASE DISTANCE Z3: Xfmr Vol Connection	None
PHASE DISTANCE Z3: Xfmr Curr Connection	None
PHASE DISTANCE Z3: Reach	5.40 ohms
PHASE DISTANCE Z3: RCA	90 deg
PHASE DISTANCE Z3: Rev Reach	5.40 ohms
PHASE DISTANCE Z3: Rev Reach RCA	79 deg
PHASE DISTANCE Z3: Comp Limit	90 deg
PHASE DISTANCE Z3: DIR RCA	45 deg
PHASE DISTANCE Z3: DIR Comp Limit	79 deg
PHASE DISTANCE Z3: Quad Right Blinder	5.40 ohms
PHASE DISTANCE Z3: Quad Right Blinder RCA	79 deg
PHASE DISTANCE Z3: Quad Left Blinder	5.40 ohms
PHASE DISTANCE Z3: Quad Left Blinder RCA	79 deg
PHASE DISTANCE Z3: Supervision	0.200 pu
PHASE DISTANCE Z3: Volt Level	0.000 pu
PHASE DISTANCE Z3: Delay	2.000 s
PHASE DISTANCE Z3: Block	BLQ Zonas PH On (VO1)
PHASE DISTANCE Z3: Target	Self-reset
PHASE DISTANCE Z3: Events	Enabled
PHASE DISTANCE Z4: Function	Enabled
PHASE DISTANCE Z4: Direction	Reverse
PHASE DISTANCE Z4: Shape	Quad
PHASE DISTANCE Z4: Xfmr Vol Connection	None
PHASE DISTANCE Z4: Xfmr Curr Connection	None
PHASE DISTANCE Z4: Reach	2.00 ohms
PHASE DISTANCE Z4: RCA	90 deg
PHASE DISTANCE Z4: Rev Reach	2.00 ohms
PHASE DISTANCE Z4: Rev Reach RCA	79 deg
PHASE DISTANCE Z4: Comp Limit	90 deg
PHASE DISTANCE Z4: DIR RCA	45 deg
PHASE DISTANCE Z4: DIR Comp Limit	79 deg
PHASE DISTANCE Z4: Quad Right Blinder	2.00 ohms
PHASE DISTANCE Z4: Quad Right Blinder RCA	79 deg
PHASE DISTANCE Z4: Quad Left Blinder	2.00 ohms
PHASE DISTANCE Z4: Quad Left Blinder RCA	79 deg
PHASE DISTANCE Z4: Supervision	0.200 pu
PHASE DISTANCE Z4: Volt Level	0.000 pu
PHASE DISTANCE Z4: Delay	2.000 s
PHASE DISTANCE Z4: Block	BLQ Zonas PH On (VO1)
PHASE DISTANCE Z4: Target	Self-reset
PHASE DISTANCE Z4: Events	Enabled

GROUND DISTANCE [GROUP 3]

GROUND DISTANCE Z1: Function	Enabled
GROUND DISTANCE Z1: Direction	Forward
GROUND DISTANCE Z1: Shape	Quad
GROUND DISTANCE Z1: Z0/Z1 Mag	3.36
GROUND DISTANCE Z1: Z0/Z1 Ang	1 deg
GROUND DISTANCE Z1: Z0M/Z1 Mag	2.25
GROUND DISTANCE Z1: Z0M/Z1 Ang	2 deg
GROUND DISTANCE Z1: Reach	1.72 ohms
GROUND DISTANCE Z1: RCA	90 deg
GROUND DISTANCE Z1: Rev Reach	1.72 ohms
GROUND DISTANCE Z1: Rev Reach RCA	79 deg
GROUND DISTANCE Z1: POL Current	Zero-seq
GROUND DISTANCE Z1: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z1: Comp Limit	90 deg
GROUND DISTANCE Z1: DIR RCA	45 deg
GROUND DISTANCE Z1: DIR Comp Limit	79 deg
GROUND DISTANCE Z1: Quad Right Blinder	3.44 ohms
GROUND DISTANCE Z1: Quad Right Blinder RCA	79 deg
GROUND DISTANCE Z1: Quad Left Blinder	3.44 ohms
GROUND DISTANCE Z1: Quad Left Blinder RCA	79 deg
GROUND DISTANCE Z1: Supervision	0.200 pu
GROUND DISTANCE Z1: Volt Level	0.000 pu

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ORDER CODE: D60-G00-HCH-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

GROUND DISTANCE [GROUP 3] (continued from last page)

GROUND DISTANCE Z1: Delay	0.000 s
GROUND DISTANCE Z1: Block	SRC1 VT FUSE FAIL OP
GROUND DISTANCE Z1: Target	Self-reset
GROUND DISTANCE Z1: Events	Enabled
GROUND DISTANCE Z2: Function	Enabled
GROUND DISTANCE Z2: Direction	Forward
GROUND DISTANCE Z2: Shape	Quad
GROUND DISTANCE Z2: Z0/Z1 Mag	3.36
GROUND DISTANCE Z2: Z0/Z1 Ang	1 deg
GROUND DISTANCE Z2: Z0M/Z1 Mag	2.25
GROUND DISTANCE Z2: Z0M/Z1 Ang	2 deg
GROUND DISTANCE Z2: Reach	3.60 ohms
GROUND DISTANCE Z2: RCA	90 deg
GROUND DISTANCE Z2: Rev Reach	3.60 ohms
GROUND DISTANCE Z2: Rev Reach RCA	79 deg
GROUND DISTANCE Z2: POL Current	Zero-seq
GROUND DISTANCE Z2: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z2: Comp Limit	90 deg
GROUND DISTANCE Z2: DIR RCA	45 deg
GROUND DISTANCE Z2: DIR Comp Limit	79 deg
GROUND DISTANCE Z2: Quad Right Blinder	6.40 ohms
GROUND DISTANCE Z2: Quad Right Blinder RCA	79 deg
GROUND DISTANCE Z2: Quad Left Blinder	6.40 ohms
GROUND DISTANCE Z2: Quad Left Blinder RCA	79 deg
GROUND DISTANCE Z2: Supervision	0.100 pu
GROUND DISTANCE Z2: Volt Level	0.000 pu
GROUND DISTANCE Z2: Delay	0.600 s
GROUND DISTANCE Z2: Block	SRC1 VT FUSE FAIL OP
GROUND DISTANCE Z2: Target	Self-reset
GROUND DISTANCE Z2: Events	Enabled
GROUND DISTANCE Z3: Function	Enabled
GROUND DISTANCE Z3: Direction	Forward
GROUND DISTANCE Z3: Shape	Quad
GROUND DISTANCE Z3: Z0/Z1 Mag	3.36
GROUND DISTANCE Z3: Z0/Z1 Ang	1 deg
GROUND DISTANCE Z3: Z0M/Z1 Mag	2.25
GROUND DISTANCE Z3: Z0M/Z1 Ang	2 deg
GROUND DISTANCE Z3: Reach	5.40 ohms
GROUND DISTANCE Z3: RCA	90 deg
GROUND DISTANCE Z3: Rev Reach	5.40 ohms
GROUND DISTANCE Z3: Rev Reach RCA	79 deg
GROUND DISTANCE Z3: POL Current	Zero-seq
GROUND DISTANCE Z3: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z3: Comp Limit	90 deg
GROUND DISTANCE Z3: DIR RCA	45 deg
GROUND DISTANCE Z3: DIR Comp Limit	79 deg
GROUND DISTANCE Z3: Quad Right Blinder	6.40 ohms
GROUND DISTANCE Z3: Quad Right Blinder RCA	79 deg
GROUND DISTANCE Z3: Quad Left Blinder	6.40 ohms
GROUND DISTANCE Z3: Quad Left Blinder RCA	79 deg
GROUND DISTANCE Z3: Supervision	0.100 pu
GROUND DISTANCE Z3: Volt Level	0.000 pu
GROUND DISTANCE Z3: Delay	2.000 s
GROUND DISTANCE Z3: Block	SRC1 VT FUSE FAIL OP
GROUND DISTANCE Z3: Target	Self-reset
GROUND DISTANCE Z3: Events	Enabled
GROUND DISTANCE Z4: Function	Enabled
GROUND DISTANCE Z4: Direction	Reverse
GROUND DISTANCE Z4: Shape	Quad
GROUND DISTANCE Z4: Z0/Z1 Mag	3.36
GROUND DISTANCE Z4: Z0/Z1 Ang	1 deg
GROUND DISTANCE Z4: Z0M/Z1 Mag	2.25
GROUND DISTANCE Z4: Z0M/Z1 Ang	2 deg
GROUND DISTANCE Z4: Reach	2.00 ohms
GROUND DISTANCE Z4: RCA	90 deg
GROUND DISTANCE Z4: Rev Reach	2.00 ohms
GROUND DISTANCE Z4: Rev Reach RCA	79 deg
GROUND DISTANCE Z4: POL Current	Zero-seq
GROUND DISTANCE Z4: Non-Homogen Ang	0.0 deg

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DESCRIPTION: (NONE)
TEXT COLOR

GROUND DISTANCE [GROUP 3] (continued from last page)

GROUND DISTANCE Z4: Comp Limit	90 deg
GROUND DISTANCE Z4: DIR RCA	45 deg
GROUND DISTANCE Z4: DIR Comp Limit	79 deg
GROUND DISTANCE Z4: Quad Right Blinder	2.00 ohms
GROUND DISTANCE Z4: Quad Right Blinder RCA	79 deg
GROUND DISTANCE Z4: Quad Left Blinder	2.00 ohms
GROUND DISTANCE Z4: Quad Left Blinder RCA	79 deg
GROUND DISTANCE Z4: Supervision	0.100 pu
GROUND DISTANCE Z4: Volt Level	0.000 pu
GROUND DISTANCE Z4: Delay	2.000 s
GROUND DISTANCE Z4: Block	SRC1 VT FUSE FAIL OP
GROUND DISTANCE Z4: Target	Self-reset
GROUND DISTANCE Z4: Events	Enabled

POWER SWING DETECT [GROUP 3]

Function	Enabled
Source	LINEA (SRC 1)
Shape	Quad Shape
Mode	Two Step
Supv	0.200 pu
Fwd Reach	6.50 ohms
Quad Fwd Mid	60.00 ohms
Quad Fwd Out	8.50 ohms
Fwd Rca	79 deg
Rev Reach	3.50 ohms
Quad Rev Mid	60.00 ohms
Quad Rev Out	5.50 ohms
Rev Rca	90 deg
Outer Limit Angle	120 deg
Middle Limit Angle	90 deg
Inner Limit Angle	79 deg
Outer Rgt Bld	7.80 ohms
Outer Lft Bld	6.97 ohms
Midle Rgt Bld	100.00 ohms
Midle Lft Bld	100.00 ohms
Inner Rgt Bld	5.80 ohms
Inner Lft Bld	4.97 ohms
Delay 1 Pickup	0.001 s
Delay 1 Reset	0.050 s
Delay 2 Pickup	0.017 s
Delay 3 Pickup	0.009 s
Delay 4 Pickup	0.017 s
Seal-In Delay	0.400 s
Trip Mode	Delayed
Block	NEUTRAL TOC1 PKP
Target	Self-reset
Event	Disabled

PHASE CURRENT

PHASE TOC [GROUP 3]

PHASE TOC1: Function	Enabled
PHASE TOC1: Signal Source	LINEA (SRC 1)
PHASE TOC1: Input	Phasor
PHASE TOC1: Pickup	1.200 pu
PHASE TOC1: Curve	IEC Curve A
PHASE TOC1: TD Multiplier	0.22
PHASE TOC1: Reset	Instantaneous
PHASE TOC1: Voltage Restraint	Disabled
PHASE TOC1: Block A	PH DIR1 BLK
PHASE TOC1: Block B	PH DIR1 BLK
PHASE TOC1: Block C	PH DIR1 BLK
PHASE TOC1: Target	Self-reset
PHASE TOC1: Events	Enabled

PHASE IOC [GROUP 3]

PHASE IOC1: Function	Enabled
PHASE IOC1: Source	LINEA (SRC 1)
PHASE IOC1: Pickup	4.600 pu
PHASE IOC1: Delay	0.01 s

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DESCRIPTION: (NONE)
TEXT COLOR

PHASE IOC [GROUP 3] (continued from last page)

PHASE IOC1: Reset Delay	0.00 s
PHASE IOC1: Block A	SRC1 VT FUSE FAIL DPO
PHASE IOC1: Block B	SRC1 VT FUSE FAIL DPO
PHASE IOC1: Block C	SRC2 VT FUSE FAIL DPO
PHASE IOC1: Target	Self-reset
PHASE IOC1: Events	Enabled

NEUTRAL CURRENT

NEUTRAL TOC [GROUP 3]

NEUTRAL TOC1: Function	Enabled
NEUTRAL TOC1: Source	LINEA (SRC 1)
NEUTRAL TOC1: Input	Phasor
NEUTRAL TOC1: Pickup	0.480 pu
NEUTRAL TOC1: Curve	IEC Curve A
NEUTRAL TOC1: TD Multiplier	0.13
NEUTRAL TOC1: Reset	Instantaneous
NEUTRAL TOC1: Block	BL-NTCO-NIOC On (VO7)
NEUTRAL TOC1: Target	Self-reset
NEUTRAL TOC1: Events	Enabled

NEUTRAL IOC [GROUP 3]

NEUTRAL IOC1: Function	Enabled
NEUTRAL IOC1: Source	LINEA (SRC 1)
NEUTRAL IOC1: Pickup	3.000 pu
NEUTRAL IOC1: Delay	0.03 s
NEUTRAL IOC1: Reset Delay	0.00 s
NEUTRAL IOC1: Block	BL-NTCO-NIOC On (VO7)
NEUTRAL IOC1: Target	Self-reset
NEUTRAL IOC1: Events	Enabled

NEGATIVE SEQUENCE CURRENT

NEGATIVE SEQUENCE DIRECTIONAL OC [GROUP 3]

NEGATIVE SEQ DIR OC1: Function	Enabled
NEGATIVE SEQ DIR OC1: Source	LINEA (SRC 1)
NEGATIVE SEQ DIR OC1: Offset	0.00 ohms
NEGATIVE SEQ DIR OC1: Type	Neg Sequence
NEGATIVE SEQ DIR OC1: POS SEQ Restraint	0.000
NEGATIVE SEQ DIR OC1: Forward ECA	81 ° Lag
NEGATIVE SEQ DIR OC1: Forward Limit Angle	80 deg
NEGATIVE SEQ DIR OC1: Forward Pickup	0.10 pu
NEGATIVE SEQ DIR OC1: Reverse Limit Angle	81 deg
NEGATIVE SEQ DIR OC1: Reverse Pickup	0.10 pu
NEGATIVE SEQ DIR OC1: Block	SRC1 VT FUSE FAIL OP
NEGATIVE SEQ DIR OC1: Target	Self-reset
NEGATIVE SEQ DIR OC1: Events	Enabled

BREAKER FAILURE [GROUP 3]

BF1: Function	Enabled
BF1: Mode	3-Pole
BF1: Source	LINEA (SRC 1)
BF1: Current Supervision	Yes
BF1: Use Seal-In	No
BF1: Three Pole Initiate	TRIP 3-POLE
BF1: Block	OFF
BF1: Phase Current Supv Pickup	1.200 pu
BF1: Neutral Current Supv Pickup	0.480 pu
BF1: Use Timer 1	Yes
BF1: Timer 1 Pickup Delay	0.200 s
BF1: Use Timer 2	No
BF1: Timer 2 Pickup Delay	0.000 s
BF1: Use Timer 3	No
BF1: Timer 3 Pickup Delay	0.000 s
BF1: Breaker Pos1 Phase A/3P	52A2 (a) On(H7a)
BF1: Breaker Pos2 Phase A/3P	OFF
BF1: Breaker Test On	OFF
BF1: Phase Current HiSet Pickup	1.200 pu
BF1: Neutral Current HiSet Pickup	0.480 pu
BF1: Phase Current LoSet Pickup	1.200 pu
BF1: Neutral Current LoSet Pickup	0.480 pu

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DESCRIPTION: (NONE)
TEXT COLOR

BREAKER FAILURE [GROUP 3] (continued from last page)

BF1: LoSet Time Delay	0.000 s
BF1: Trip Dropout Delay	0.000 s
BF1: Target	Self-reset
BF1: Events	Enabled
BF1: Phase A Initiate	OFF
BF1: Phase B Initiate	OFF
BF1: Phase C Initiate	OFF
BF1: Breaker Pos1 Phase B	OFF
BF1: Breaker Pos1 Phase C	OFF
BF1: Breaker Pos2 Phase B	OFF
BF1: Breaker Pos2 Phase C	OFF

CONTROL ELEMENTS

SETTING GROUPS

Function	Enabled
Block	OFF
Group 2 Activate On	OFF
Group 3 Activate On	ON
Group 4 Activate On	OFF
Group 5 Activate On	OFF
Group 6 Activate On	OFF
Group 1 Name	AJA-RGUA
Group 2 Name	AJA-RGUA-TIN
Group 3 Name	AJA-RGUA CAMB CO
Group 4 Name	
Group 5 Name	
Group 6 Name	
Events	Enabled

SELECTOR SWITCHES

SELECTOR SWITCH 1: Function	Enabled
SELECTOR SWITCH 1: Full Range	2
SELECTOR SWITCH 1: Timeout	3.0 s
SELECTOR SWITCH 1: Step-Up	CONTROL PUSHBUTTON 1 ON
SELECTOR SWITCH 1: Step-Up Mode	Time-out
SELECTOR SWITCH 1: Acknowledge	OFF
SELECTOR SWITCH 1: 3Bit A0	OFF
SELECTOR SWITCH 1: 3Bit A1	OFF
SELECTOR SWITCH 1: 3Bit A2	OFF
SELECTOR SWITCH 1: 3Bit Mode	Time-out
SELECTOR SWITCH 1: 3Bit Ack	OFF
SELECTOR SWITCH 1: Power-Up Mode	Restore
SELECTOR SWITCH 1: Targets	Self-reset
SELECTOR SWITCH 1: Events	Disabled

TRIP OUTPUT

Trip Mode	3 Pole Only
Trip 3-Pole Input1	TRIP GRAL On (VO2)
Trip 3-Pole Input2	OFF
Trip 3-Pole Input3	OFF
Trip 3-Pole Input4	OFF
Trip 3-Pole Input5	OFF
Trip 3-Pole Input6	OFF
Trip 1-Pole Input1	OFF
Trip 1-Pole Input2	OFF
Trip 1-Pole Input3	OFF
Trip 1-Pole Input4	OFF
Trip 1-Pole Input5	OFF
Trip 1-Pole Input6	OFF
Trip Reclose Input1	OFF
Trip Reclose Input2	OFF
Trip Reclose Input3	OFF
Trip Reclose Input4	OFF
Trip Reclose Input5	OFF
Trip Reclose Input6	OFF
BKR Phase A Open	LINE PICKUP I<A
BKR Phase B Open	LINE PICKUP I<B
BKR Phase C Open	LINE PICKUP I<C
Trip Force 3-Pole	OFF

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DESCRIPTION: (NONE)
TEXT COLOR

TRIP OUTPUT (continued from last page)

Trip Pilot Priority	0.000 s
Reverse Fault	OFF
Trip Delay On Evolving Faults	0.000 s
Trip Events	Enabled

MONITORING ELEMENTS

VT FUSE FAILURE

VT FUSE FAILURE 1: Function	Enabled
VT FUSE FAILURE 2: Function	Enabled

PILOT SCHEMES

1P POTT SCHEME

Function	Enabled
Permissive Echo	Disabled
Echo Condition	OFF
Rx Pickup Delay	0.000 s
Trans Block Pickup Delay	0.030 s
Trans Block Reset Delay	0.170 s
Echo Duration	0.100 s
Echo Lockout	0.250 s
Line End Open Pickup Delay	0.050 s
Seal-In Delay	0.000 s
Gnd Dir OC Fwd	OFF
Comm Bits	1
Rx1	RECEPCION 2T On (VO37)
Rx2	OFF
Rx3	OFF
Rx4	OFF
Target	Self-reset
Event	Disabled

1P HYBRID POTT SCHEME

Function	Enabled
Permissive Echo	Disabled
Echo Condition	OFF
Weak Infeed	Disabled
W/I Condition	OFF
Rx Pickup Delay	0.000 s
Trans Block Pickup Delay	0.030 s
Trans Block Reset Delay	0.150 s
Echo Duration	0.100 s
Echo Lockout	0.250 s
Seal-In Delay	0.000 s
Gnd Dir OC Fwd	OFF
Gnd Dir OC Rev	BL-NTCO-NIOC On (VO7)
No of Comm Bits	1
Rx1	RECEPCION 3T On (VO36)
Rx2	OFF
Rx3	OFF
Rx4	OFF
Target	Self-reset
Event	Enabled

INPUTS/OUTPUTS

CONTACT INPUTS

[H7A] Contact Input 1 ID	52A2 (a)
[H7A] Contact Input 1 Debounce Time	2.0 ms
[H7A] Contact Input 1 Events	Enabled
[H7C] Contact Input 2 ID	79 conectado
[H7C] Contact Input 2 Debounce Time	2.0 ms
[H7C] Contact Input 2 Events	Enabled
[H8A] Contact Input 3 ID	86B--> 50BF
[H8A] Contact Input 3 Debounce Time	2.0 ms
[H8A] Contact Input 3 Events	Enabled
[H8C] Contact Input 4 ID	Rx RANCAGUA
[H8C] Contact Input 4 Debounce Time	2.0 ms
[H8C] Contact Input 4 Events	Enabled
[U7A] Contact Input 5 ID	FALLA RELE
[U7A] Contact Input 5 Debounce Time	2.0 ms

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DESCRIPTION: (NONE)
TEXT COLOR

CONTACT INPUTS (continued from last page)

[U7A] Contact Input 5 Events	Disabled
[U7C] Contact Input 6 ID	Cont Ip 6
[U7C] Contact Input 6 Debounce Time	2.0 ms
[U7C] Contact Input 6 Events	Disabled
[U8A] Contact Input 7 ID	Cont Ip 7
[U8A] Contact Input 7 Debounce Time	2.0 ms
[U8A] Contact Input 7 Events	Disabled
[U8C] Contact Input 8 ID	Cont Ip 8
[U8C] Contact Input 8 Debounce Time	2.0 ms
[U8C] Contact Input 8 Events	Disabled
[W1A] Contact Input 9 ID	Rx TINGUI
[W1A] Contact Input 9 Debounce Time	2.0 ms
[W1A] Contact Input 9 Events	Enabled
[W1C] Contact Input 10 ID	80 SISTEMA 1
[W1C] Contact Input 10 Debounce Time	2.0 ms
[W1C] Contact Input 10 Events	Enabled
[W2A] Contact Input 11 ID	CHANGE GRP
[W2A] Contact Input 11 Debounce Time	2.0 ms
[W2A] Contact Input 11 Events	Enabled
[W2C] Contact Input 12 ID	Cont Ip 12
[W2C] Contact Input 12 Debounce Time	2.0 ms
[W2C] Contact Input 12 Events	Enabled
[W3A] Contact Input 13 ID	Cont Ip 13
[W3A] Contact Input 13 Debounce Time	2.0 ms
[W3A] Contact Input 13 Events	Disabled
[W3C] Contact Input 14 ID	Cont Ip 14
[W3C] Contact Input 14 Debounce Time	2.0 ms
[W3C] Contact Input 14 Events	Disabled
[W4A] Contact Input 15 ID	Cont Ip 15
[W4A] Contact Input 15 Debounce Time	2.0 ms
[W4A] Contact Input 15 Events	Disabled
[W4C] Contact Input 16 ID	Cont Ip 16
[W4C] Contact Input 16 Debounce Time	2.0 ms
[W4C] Contact Input 16 Events	Disabled
[W5A] Contact Input 17 ID	Cont Ip 17
[W5A] Contact Input 17 Debounce Time	2.0 ms
[W5A] Contact Input 17 Events	Disabled
[W5C] Contact Input 18 ID	Cont Ip 18
[W5C] Contact Input 18 Debounce Time	2.0 ms
[W5C] Contact Input 18 Events	Disabled
[W6A] Contact Input 19 ID	Cont Ip 19
[W6A] Contact Input 19 Debounce Time	2.0 ms
[W6A] Contact Input 19 Events	Disabled
[W6C] Contact Input 20 ID	Cont Ip 20
[W6C] Contact Input 20 Debounce Time	2.0 ms
[W6C] Contact Input 20 Events	Disabled
[W7A] Contact Input 21 ID	Cont Ip 21
[W7A] Contact Input 21 Debounce Time	2.0 ms
[W7A] Contact Input 21 Events	Disabled
[W7C] Contact Input 22 ID	Cont Ip 22
[W7C] Contact Input 22 Debounce Time	2.0 ms
[W7C] Contact Input 22 Events	Disabled
[W8A] Contact Input 23 ID	Cont Ip 23
[W8A] Contact Input 23 Debounce Time	2.0 ms
[W8A] Contact Input 23 Events	Disabled
[W8C] Contact Input 24 ID	Cont Ip 24
[W8C] Contact Input 24 Debounce Time	2.0 ms
[W8C] Contact Input 24 Events	Disabled

CONTACT INPUT THRESHOLDS

52A2 (a), 79 conectado, 86B--> 50BF, Rx RANCAGUA(H7a, H7c, H8a, H8c)	84 Vdc
FALLA RELE, Cont Ip 6, Cont Ip 7, Cont Ip 8(U7a, U7c, U8a, U8c)	84 Vdc
Rx TINGUI, 80 SISTEMA 1, CHANGE GRP, Cont Ip 12(W1a, W1c, W2a, W2c)	84 Vdc
Cont Ip 13, Cont Ip 14, Cont Ip 15, Cont Ip 16(W3a, W3c, W4a, W4c)	84 Vdc
Cont Ip 17, Cont Ip 18, Cont Ip 19, Cont Ip 20(W5a, W5c, W6a, W6c)	84 Vdc
Cont Ip 21, Cont Ip 22, Cont Ip 23, Cont Ip 24(W7a, W7c, W8a, W8c)	84 Vdc

CONTACT OUTPUTS

[H1] Contact Output 1 ID	TRIP BD1

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DESCRIPTION: (NONE)
TEXT COLOR

CONTACT OUTPUTS (continued from last page)

[H1] Contact Output 1 Operate	TRIP GRAL On (VO2)
[H1] Contact Output 1 Seal-In	OFF
[H1] Contact Output 1 Events	Enabled
[H2] Contact Output 2 ID	RETRIP 50BF
[H2] Contact Output 2 Operate	BKR FAIL 1 RETRIP
[H2] Contact Output 2 Seal-In	OFF
[H2] Contact Output 2 Events	Enabled
[H3] Contact Output 3 ID	50BF --> 86B
[H3] Contact Output 3 Operate	BKR FAIL 1 T1 OP
[H3] Contact Output 3 Seal-In	OFF
[H3] Contact Output 3 Events	Enabled
[H4] Contact Output 4 ID	OPERACION 79
[H4] Contact Output 4 Operate	ORD. CIERRE On (VO6)
[H4] Contact Output 4 Seal-In	OFF
[H4] Contact Output 4 Events	Enabled
[M1] Contact Output 7 ID	CONT 79 S2
[M1] Contact Output 7 Operate	SELECTOR 1 POS 1
[M1] Contact Output 7 Seal-In	OFF
[M1] Contact Output 7 Events	Enabled
[M2] Contact Output 8 ID	Tx TINGUI
[M2] Contact Output 8 Operate	Tx TINGUI On (VO45)
[M2] Contact Output 8 Seal-In	OFF
[M2] Contact Output 8 Events	Enabled
[M3] Contact Output 9 ID	URT REC ACEL
[M3] Contact Output 9 Operate	RECEPCION On (VO41)
[M3] Contact Output 9 Seal-In	OFF
[M3] Contact Output 9 Events	Enabled
[M4] Contact Output 10 ID	URT OPE Z1
[M4] Contact Output 10 Operate	OPERA ZONA 1 On (VO12)
[M4] Contact Output 10 Seal-In	OFF
[M4] Contact Output 10 Events	Enabled
[M5] Contact Output 11 ID	URT OPE Z4
[M5] Contact Output 11 Operate	OPERA ZONA 4 On (VO15)
[M5] Contact Output 11 Seal-In	OFF
[M5] Contact Output 11 Events	Enabled
[M6] Contact Output 12 ID	URT OPE Z5
[M6] Contact Output 12 Operate	OPERA ZONA 5 On (VO16)
[M6] Contact Output 12 Seal-In	OFF
[M6] Contact Output 12 Events	Enabled
[M8] Contact Output 14 ID	PARA PRUEBAS
[M8] Contact Output 14 Operate	TRIP GRAL On (VO2)
[M8] Contact Output 14 Seal-In	OFF
[M8] Contact Output 14 Events	Enabled
[P1] Contact Output 15 ID	URT Z2 OPER
[P1] Contact Output 15 Operate	OPERA ZONA 2 On (VO13)
[P1] Contact Output 15 Seal-In	OFF
[P1] Contact Output 15 Events	Enabled
[P2] Contact Output 16 ID	URT Z3 OP
[P2] Contact Output 16 Operate	OPERA ZONA 3 On (VO14)
[P2] Contact Output 16 Seal-In	OFF
[P2] Contact Output 16 Events	Enabled
[P3] Contact Output 17 ID	URT OPER 79
[P3] Contact Output 17 Operate	ORD. CIERRE On (VO6)
[P3] Contact Output 17 Seal-In	OFF
[P3] Contact Output 17 Events	Enabled
[P4] Contact Output 18 ID	URT SOTF OP
[P4] Contact Output 18 Operate	LINE PICKUP OP
[P4] Contact Output 18 Seal-In	OFF
[P4] Contact Output 18 Events	Enabled
[P5] Contact Output 19 ID	URT 50 BF OP
[P5] Contact Output 19 Operate	BKR FAIL 1 T2 OP
[P5] Contact Output 19 Seal-In	OFF
[P5] Contact Output 19 Events	Enabled
[P6] Contact Output 20 ID	URT TRIP S1
[P6] Contact Output 20 Operate	TRIP GRAL On (VO2)
[P6] Contact Output 20 Seal-In	OFF
[P6] Contact Output 20 Events	Enabled
[P7] Contact Output 21 ID	URT FA RELE
[P7] Contact Output 21 Operate	FALLA RELE On (VO21)

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VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

CONTACT OUTPUTS (continued from last page)

[P7] Contact Output 21 Seal-In	OFF
[P7] Contact Output 21 Events	Enabled
[P8] Contact Output 22 ID	Tx RANCAGUA
[P8] Contact Output 22 Operate	Tx RANCAGUA On (VO44)
[P8] Contact Output 22 Seal-In	OFF
[P8] Contact Output 22 Events	Enabled
[U1] Contact Output 23 ID	80 SISTEMA 1
[U1] Contact Output 23 Operate	80 SISTEMA 1 VOn (U1)
[U1] Contact Output 23 Seal-In	OFF
[U1] Contact Output 23 Events	Enabled

VIRTUAL OUTPUTS

Virtual Output 1 ID	BLQ Zonas PH
Virtual Output 1 Events	Enabled
Virtual Output 2 ID	TRIP GRAL
Virtual Output 2 Events	Enabled
Virtual Output 3 ID	OSCILOGRAFIA
Virtual Output 3 Events	Enabled
Virtual Output 4 ID	pkp Z1o z2
Virtual Output 4 Events	Enabled
Virtual Output 6 ID	ORD. CIERRE
Virtual Output 6 Events	Enabled
Virtual Output 7 ID	BL-NTCO-NIOC
Virtual Output 7 Events	Enabled
Virtual Output 10 ID	RESET 79
Virtual Output 10 Events	Enabled
Virtual Output 12 ID	OPERA ZONA 1
Virtual Output 12 Events	Disabled
Virtual Output 13 ID	OPERA ZONA 2
Virtual Output 13 Events	Enabled
Virtual Output 14 ID	OPERA ZONA 3
Virtual Output 14 Events	Enabled
Virtual Output 15 ID	OPERA ZONA 4
Virtual Output 15 Events	Enabled
Virtual Output 16 ID	OPERA ZONA 5
Virtual Output 16 Events	Enabled
Virtual Output 17 ID	79 on
Virtual Output 17 Events	Enabled
Virtual Output 18 ID	79 off
Virtual Output 18 Events	Enabled
Virtual Output 19 ID	reset led
Virtual Output 19 Events	Enabled
Virtual Output 21 ID	FALLA RELE
Virtual Output 21 Events	Enabled
Virtual Output 22 ID	RECEP ACELER
Virtual Output 22 Events	Enabled
Virtual Output 27 ID	67-67N
Virtual Output 27 Events	Disabled
Virtual Output 28 ID	51-51N
Virtual Output 28 Events	Enabled
Virtual Output 29 ID	50-50N
Virtual Output 29 Events	Enabled
Virtual Output 30 ID	Partida 79
Virtual Output 30 Events	Enabled
Virtual Output 31 ID	Control 79S2
Virtual Output 31 Events	Enabled
Virtual Output 32 ID	67N
Virtual Output 32 Events	Enabled
Virtual Output 33 ID	51-51N
Virtual Output 33 Events	Enabled
Virtual Output 34 ID	50-50N
Virtual Output 34 Events	Enabled
Virtual Output 36 ID	RECEPCION 3T
Virtual Output 36 Events	Enabled
Virtual Output 37 ID	RECEPCION 2T
Virtual Output 37 Events	Enabled
Virtual Output 41 ID	RECEPCION
Virtual Output 41 Events	Enabled
Virtual Output 44 ID	Tx RANCAGUA

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DESCRIPTION: (NONE)
TEXT COLOR

VIRTUAL OUTPUTS (continued from last page)

Virtual Output 44 Events	Enabled
Virtual Output 45 ID	Tx TINGUI
Virtual Output 45 Events	Enabled
Virtual Output 47 ID	CAMBIO G1-G2
Virtual Output 47 Events	Enabled
Virtual Output 48 ID	ECHO COND 2T
Virtual Output 48 Events	Enabled
Virtual Output 50 ID	POTT OP 2T
Virtual Output 50 Events	Enabled

RESETTING

Operand	reset led On (VO19)

Max / Centro / Alto Jahuel / 154kV / 7SA612 V4.3 AJA-A2 Var V

MLFB:	7SA61255AE227PR4
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4.1 Grupo Change Group 45

1 Device Configuration

Nº	Función	Volumen
0103	Setting Group Change Option	Enabled
0110	Trip mode	3pole only
0114	21 Distance protection pickup program	Z< (quadrilateral)
0120	68 Power Swing detection	Enabled
0121	85-21 Pilot Protection for Distance prot	POTT
0122	DTT Direct Transfer Trip	Disabled
0124	50HS Instantaneous SOTF	Enabled
0125	Weak Infeed (Trip and/or Echo)	Enabled
0126	50(N)/51(N) Backup OverCurrent	Time Overcurrent Curve IEC
0131	50N/51N Ground OverCurrent	Time Overcurrent Curve IEC
0132	85-67N Pilot Protection Gnd. OverCurrent	Disabled
0133	79 Auto-Reclose Function	Disabled
0134	Auto-Reclose control mode	with Trip and Action time
0135	25 Synchronism and Voltage Check	Enabled
0136	81 Over/Underfrequency Protection	Disabled
0137	27, 59 Under/Overvoltage Protection	Disabled
0138	Fault Locator	Enabled
0139	50BF Breaker Failure Protection	Enabled
0140	74TC Trip Circuit Supervision	Disabled
0142	49 Thermal Overload Protection	Disabled

2 Power System Data 1

2.1 Grupo Power System Data 1; Grupo Transformers

Grupo Power System Data 1; Grupo Transformers

Nº	Parámetro	Valor	Grupo
0201	CT Starpoint	towards Line	todo
0203	Rated Primary Voltage	154,0 kV	todo
0204	Rated Secondary Voltage (Ph-Ph)	110 V	todo
0205	CT Rated Primary Current	600 A	todo
0206	CT Rated Secondary Current	5A	todo
0210	V4 voltage transformer is	Vsy2 transformer	todo
0211	Matching ratio Phase-VT To Open-Delta-VT	0,58	todo
0212	VT connection for Vsy2	B-G	todo
0214A	Angle adjustment Vsy2-Vsy1	0 °	todo
0215	Matching ratio Vsy1 / Vsy2	1,00	todo
0220	I4 current transformer is	Neutral Current (of the protected line)	todo
0221	Matching ratio I4/Iph for CT's	1,000	todo

2.2 Grupo Power System Data 1; Grupo Power System

Grupo Power System Data 1; Grupo Power System

Nº	Parámetro	Valor	Grupo
0207	System Starpoint is	Solid Grounded	todo
0230	Rated Frequency	50 Hz	todo
0235	Phase Sequence	A B C	todo
0236	Distance measurement unit	km	todo
0237	Setting format for zero seq.comp. format	Zero seq. comp. factor K0 and angle(K0)	todo

2.3 Grupo Power System Data 1; Grupo Breaker

Grupo Power System Data 1; Grupo Breaker

Nº	Parámetro	Valor	Grupo
0239	Closing (operating) time of 52 (CB)	0,06 sec	todo
0240A	Minimum TRIP Command Duration	0,12 sec	todo
0241A	Maximum Close Command Duration	0,25 sec	todo
0242	Dead Time for CB test-autoreclosure	0,10 sec	todo

3 Grupos de parámetros

3.1 Grupo Power System Data 2; Grupo Power System

Grupo Power System Data 2; Grupo Power System

Nº	Parámetro	Valor	Grupo
1103	Measurement: Full Scale Voltage (100%)	154,0 kV	A
1104	Measurement: Full Scale Current (100%)	600 A	A
1105	Line Angle	79 °	A
1211	Angle of inclination, distance charact.	79 °	A
1107	P,Q operational measured values sign	not reversed	A
1110	x' - Line Reactance per length unit	0,0352 Ohm / km	A
1111	Line Length	50,6 km	A
1120	Zero seq. comp. factor K0 for zone Z1	0,809	A
1121	Zero seq. comp. angle for zone Z1	3,02 °	A
1122	Zero seq.comp.factor K0,higher zones >Z1	0,809	A
1123	Zero seq. comp. angle, higher zones >Z1	3,02 °	A

3.2 Grupo Power System Data 2; Grupo Line Status

Grupo Power System Data 2; Grupo Line Status

Nº	Parámetro	Valor	Grupo
1130A	Pole Open Current Threshold	0,25 A	A
1131A	Pole Open Voltage Threshold	11 V	A
1132A	Seal-in Time after ALL closures	0,20 sec	A
1134	Recognition of Line Closures with	CBpos(52a) OR Current or Manual close BI	A
1135	RESET of Trip Command	with CB(52a) AND I < PoleOpenCurrent	A
1140A	CT Saturation Threshold	100,0 A	A
1150A	Seal-in Time after MANUAL closures	0,20 sec	A
1151	Manual CLOSE COMMAND generation	NO	A
1152	MANUAL Closure Impulse after CONTROL	<none>	todo

3.3 Grupo 21 Distance protection, general settings; Grupo General

Grupo 21 Distance protection, general settings; Grupo General

Nº	Parámetro	Valor	Grupo
1201	21 Distance protection is	ON	A
1202	Phase Current threshold for dist. meas.	0,25 A	A
1211	Angle of inclination, distance charact.	79 °	A
1208	Series compensated line	NO	A
1232	Instantaneous trip after SwitchOnToFault	with Zone Z1B	A
1241	R load, minimum Load Impedance (ph-g)	9,140 Ohm	A
1242	PHI load, maximum Load Angle (ph-g)	35 °	A
1243	R load, minimum Load Impedance (ph-ph)	9,140 Ohm	A
1244	PHI load, maximum Load Angle (ph-ph)	35 °	A
1357	Z1B enabled before 1st AR (int. or ext.)	NO	A

3.4 Grupo 21 Distance protection, general settings; Grupo Ground faults

Grupo 21 Distance protection, general settings; Grupo Ground faults

Nº	Parámetro	Valor	Grupo
1203	3I0 threshold for neutral current pickup	0,25 A	A
1204	3V0 threshold zero seq. voltage pickup	2 V	A
1207A	3I0>-pickup-stabilisation (3I0>/ Iphmax)	0,10	A
1209A	Criterion of ground fault recognition	3I0> OR 3V0>	A
1221A	Loop selection with 2Ph-G faults	all loops	A

3.5 Grupo 21 Distance protection, general settings; Grupo Time Delays

Grupo 21 Distance protection, general settings; Grupo Time Delays

Nº	Parámetro	Valor	Grupo
1210	21 Condition for zone timer start	with distance pickup	A
1305	T1-1phase, delay for single phase faults	0,00 sec	A
1306	T1multi-ph, delay for multi phase faults	0,00 sec	A
1315	T2-1phase, delay for single phase faults	0,60 sec	A
1316	T2multi-ph, delay for multi phase faults	0,60 sec	A
1325	T3 delay	2,50 sec	A
1335	T4 delay	1,50 sec	A
1345	T5 delay	oo sec	A
1355	T1B-1phase, delay for single ph. faults	0,00 sec	A
1356	T1B-multi-ph, delay for multi ph. faults	0,00 sec	A

3.6 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1

Nº	Parámetro	Valor	Grupo
1301	Operating mode Z1	Forward	A
1302	R(Z1), Resistance for ph-ph-faults	1,860 Ohm	A
1303	X(Z1), Reactance	1,860 Ohm	A
1304	RG(Z1), Resistance for ph-gnd faults	1,860 Ohm	A
1305	T1-1phase, delay for single phase faults	0,00 sec	A
1306	T1multi-ph, delay for multi phase faults	0,00 sec	A
1307	Zone Reduction Angle (load compensation)	0 °	A

3.7 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1B-exten.

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1B-exten.

Nº	Parámetro	Valor	Grupo
1351	Operating mode Z1B (overrreach zone)	Forward	A
1352	R(Z1B), Resistance for ph-ph-faults	8,000 Ohm	A
1353	X(Z1B), Reactance	8,500 Ohm	A
1354	RG(Z1B), Resistance for ph-gnd faults	8,000 Ohm	A
1355	T1B-1phase, delay for single ph. faults	0,00 sec	A
1356	T1B-multi-ph, delay for multi ph. faults	0,00 sec	A
1357	Z1B enabled before 1st AR (int. or ext.)	NO	A

3.8 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z2

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z2

Nº	Parámetro	Valor	Grupo
1311	Operating mode Z2	Forward	A
1312	R(Z2), Resistance for ph-ph-faults	4,266 Ohm	A
1313	X(Z2), Reactance	4,266 Ohm	A
1314	RG(Z2), Resistance for ph-gnd faults	4,266 Ohm	A
1315	T2-1phase, delay for single phase faults	0,60 sec	A
1316	T2multi-ph, delay for multi phase faults	0,60 sec	A

3.9 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z3

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z3

Nº	Parámetro	Valor	Grupo
1321	Operating mode Z3	Reverse	A
1322	R(Z3), Resistance for ph-ph-faults	6,000 Ohm	A
1323	X(Z3), Reactance	6,000 Ohm	A
1324	RG(Z3), Resistance for ph-gnd faults	6,000 Ohm	A
1325	T3 delay	2,50 sec	A

3.10 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z4

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z4

Nº	Parámetro	Valor	Grupo
1331	Operating mode Z4	Forward	A
1332	R(Z4), Resistance for ph-ph-faults	6,500 Ohm	A
1333	X(Z4), Reactance	6,500 Ohm	A
1334	RG(Z4), Resistance for ph-gnd faults	13,000 Ohm	A
1335	T4 delay	1,50 sec	A

3.11 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z5

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z5

Nº	Parámetro	Valor	Grupo
1341	Operating mode Z5	Non-Directional	A
1342	R(Z5), Resistance for ph-ph-faults	14,528 Ohm	A
1343	X(Z5)+, Reactance for Forward direction	14,528 Ohm	A
1344	RG(Z5), Resistance for ph-gnd faults	14,528 Ohm	A
1345	T5 delay	oo sec	A
1346	X(Z5)-, Reactance for Reverse direction	7,000 Ohm	A

3.12 Grupo 68 Power Swing detection

Grupo 68 Power Swing detection

Nº	Parámetro	Valor	Grupo
2002	Power Swing Operating mode	all zones blocked	A
2006	68T Power swing trip	NO	A
2007	68 Trip delay after Power Swing Blocking	0,08 sec	A

3.13 Grupo 85-21 Pilot Prot. for Distance prot.

Grupo 85-21 Pilot Prot. for Distance prot.

Nº	Parámetro	Valor	Grupo
2101	85-21 Pilot Prot. for Distance prot.	ON	A
2102	Type of Line	Three Terminals	A
2103A	Time for send signal prolongation	0,10 sec	A
2109A	Transient Block.: Duration external flt.	0,03 sec	A
2110A	Transient Block.: Blk.T. after ext. flt.	0,17 sec	A

3.14 Grupo 50HS Instantaneous SOTF

Grupo 50HS Instantaneous SOTF

Nº	Parámetro	Valor	Grupo
2401	50HS Instantaneous SOTF-O/C is	ON	A

Grupo 50HS Instantaneous SOTF(2)

Nº	Parámetro	Valor	Grupo
2404	50HS SOTF-O/C PICKUP	9,41 A	A

3.15 Grupo Weak Infeed (Trip and/or Echo)

Grupo Weak Infeed (Trip and/or Echo)

Nº	Parámetro	Valor	Grupo
2501	Weak Infeed option	Echo only	A
2502A	Trip / Echo Delay after carrier receipt	0,04 sec	A
2503A	Trip Extension / Echo Impulse time	0,05 sec	A
2504A	Echo Block Time	0,50 sec	A
2505	Undervoltage (ph-g)	25 V	A
2509	Echo logic: 21 and 67N on common channel	NO	todo

3.16 Grupo 50(N)/51(N) Backup OverCurrent; Grupo General

Grupo 50(N)/51(N) Backup OverCurrent; Grupo General

Nº	Parámetro	Valor	Grupo
2601	Operating mode	ON:only active with Loss of VT sec. cir.	A
2680	Trip time delay after SOTF	0,00 sec	A

3.17 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B1

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B1

Nº	Parámetro	Valor	Grupo
2610	50-B1 Pickup	oo A	A
2611	50-B1 Delay	oo sec	A
2612	50N-B1 Pickup	oo A	A
2613	50N-B1 Delay	oo sec	A
2614	Instantaneous trip via BI	NO	A
2615	Instantaneous trip after SwitchOnToFault	NO	A

3.18 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B2

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B2

Nº	Parámetro	Valor	Grupo
2620	50-B2 Pickup	oo A	A
2621	50-B2 Delay	oo sec	A
2622	50N-B2 Pickup	oo A	A
2623	50N-B2 Delay	oo sec	A
2624	Instantaneous trip via Pilot Prot./BI	NO	A
2625	Instantaneous trip after SwitchOnToFault	NO	A

3.19 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 51(N)-B

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 51(N)-B

Nº	Parámetro	Valor	Grupo
2640	51-B Pickup	6,00 A	A
2642	51-B Time Dial	0,10 sec	A
2646	51-B Additional Time Delay	0,00 sec	A
2650	51N-B Pickup	0,41 A	A
2652	51N-B Time Dial	0,30 sec	A
2656	51N-B Additional Time Delay	0,00 sec	A
2660	IEC Curve	Normal Inverse	A
2670	Instantaneous trip via Pilot Prot./BI	NO	A
2671	Instantaneous trip after SwitchOnToFault	NO	A

3.20 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-STUB

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-STUB

Nº	Parámetro	Valor	Grupo
2630	50-STUB Pickup	oo A	A
2631	50-STUB Delay	oo sec	A
2632	50N-STUB Pickup	oo A	A
2633	50N-STUB Delay	oo sec	A
2634	Instantaneous trip via Pilot Prot./BI	NO	A
2635	Instantaneous trip after SwitchOnToFault	NO	A

3.21 Grupo Measurement Supervision; Grupo Balance / Summ.

Grupo Measurement Supervision; Grupo Balance / Summ.

Nº	Parámetro	Valor	Grupo
2901	Measurement Supervision	ON	A
2902A	Voltage Threshold for Balance Monitoring	50 V	A
2903A	Balance Factor for Voltage Monitor	0,75	A
2904A	Current Threshold for Balance Monitoring	0,50 A	A
2905A	Balance Factor for Current Monitor	0,50	A
2906A	Summated Current Monitoring Threshold	0,50 A	A
2907A	Summated Current Monitoring Factor	0,10	A
2908A	T Balance Factor for Voltage Monitor	5 sec	A
2909A	T Current Balance Monitor	5 sec	A

3.22 Grupo Measurement Supervision; Grupo Meas.Volt.Fail

Grupo Measurement Supervision; Grupo Meas.Volt.Fail

Nº	Parámetro	Valor	Grupo
2910	Fuse Failure Monitor	ON	A
2911A	Minimum Voltage Threshold V>	30 V	A
2912A	Maximum Current Threshold I<	0,50 A	A
2913A	Maximum Voltage Threshold V< (3phase)	5 V	A
2914A	Differential Current Threshold (3phase)	0,50 A	A
2915	Voltage Failure Supervision	with current superv. and CBpos(52a)	A
2916A	Delay Voltage Failure Supervision	3,00 sec	A

3.23 Grupo Measurement Supervision; Grupo VT mcb

Grupo Measurement Supervision; Grupo VT mcb

Nº	Parámetro	Valor	Grupo
2921	VT mcb operating time	5 ms	A

3.24 Grupo 50N/51N Ground OverCurrent; Grupo General

Grupo 50N/51N Ground OverCurrent; Grupo General

Nº	Parámetro	Valor	Grupo
3101	50N/51N Ground Overcurrent	ON	A
3102	Block 50N/51N for Distance protection	NO	A
3174	Block 50N/51N for Pickup 21	in each zone	A
3104A	Stabilisation Slope with Iphase	10 %	A
3170	2nd harmonic ratio for inrush restraint	20 %	A
3171	Max.Current, overriding inrush restraint	37,50 A	A
3172	Instantaneous mode after SwitchOnToFault	with Pickup and direction	A
3173	Trip time delay after SOTF	0,00 sec	A

3.25 Grupo 50N/51N Ground OverCurrent; Grupo 50N-1

Grupo 50N/51N Ground OverCurrent; Grupo 50N-1

Nº	Parámetro	Valor	Grupo
3110	Operating mode	Inactive	A
3111	Pickup	6,50 A	A
3112	Time Delay	0,30 sec	A
3113	Instantaneous trip via Pilot Prot./BI	NO	A
3114	Instantaneous trip after SwitchOnToFault	NO	A
3115	Inrush Blocking	NO	A

3.26 Grupo 50N/51N Ground OverCurrent; Grupo 50N-2

Grupo 50N/51N Ground OverCurrent; Grupo 50N-2

Nº	Parámetro	Valor	Grupo
3120	Operating mode	Inactive	A
3121	Pickup	0,83 A	A
3122	Time Delay	0,60 sec	A
3123	Instantaneous trip via Pilot Prot./BI	NO	A
3124	Instantaneous trip after SwitchOnToFault	NO	A
3125	Inrush Blocking	NO	A

3.27 Grupo 50N/51N Ground OverCurrent; Grupo 50N-3

Grupo 50N/51N Ground OverCurrent; Grupo 50N-3

Nº	Parámetro	Valor	Grupo
3130	Operating mode	Inactive	A
3131	Pickup	0,83 A	A
3132	Time Delay	0,90 sec	A
3133	Instantaneous trip via Pilot Prot./BI	NO	A
3134	Instantaneous trip after SwitchOnToFault	NO	A
3135	Inrush Blocking	NO	A

3.28 Grupo 50N/51N Ground OverCurrent; Grupo 51N InverseTime

Grupo 50N/51N Ground OverCurrent; Grupo 51N InverseTime

Nº	Parámetro	Valor	Grupo
3140	Operating mode	Forward	A
3141	Pickup	0,41 A	A
3143	Time Dial	0,30 sec	A
3147	Additional Time Delay	0,00 sec	A
3148	Instantaneous trip via Pilot Prot./BI	NO	A
3149	Instantaneous trip after SwitchOnToFault	NO	A
3150	Inrush Blocking	NO	A
3151	IEC Curve	Normal Inverse	A

3.29 Grupo 50N/51N Ground OverCurrent; Grupo Direction

Grupo 50N/51N Ground OverCurrent; Grupo Direction

Nº	Parámetro	Valor	Grupo
3160	Polarization	with Vo + Ig or V2	A
3162A	ALPHA, lower angle for forward direction	338 °	A
3163A	BETA, upper angle for forward direction	122 °	A
3164	Min. zero seq.voltage 3Vo for polarizing	3,0 V	A
3166	Min. neg. seq. polarizing voltage 3V2	3,0 V	A
3167	Min. neg. seq. polarizing current 3I2	0,25 A	A
3168	Compensation angle PHI comp. for Sr	255 °	A
3169	Forward direction power threshold	1,5 VA	A

3.30 Grupo 25 Synchronism and Voltage Check; Grupo General

Grupo 25 Synchronism and Voltage Check; Grupo General

Nº	Parámetro	Valor	Grupo
3501	25 Synchronism and Voltage Check	ON	A
3502	Voltage threshold dead line / bus	10 V	A
3503	Voltage threshold live line / bus	44 V	A
3504	Maximum permissible voltage	70 V	A
3507	Maximum duration of synchronism-check	1,00 sec	A
3508	Synchronous condition stability timer	0,00 sec	A
3509	Synchronizable circuit breaker	<none>	todo

3.31 Grupo 25 Synchronism and Voltage Check; Grupo with AR

Grupo 25 Synchronism and Voltage Check; Grupo with AR

Nº	Parámetro	Valor	Grupo
3510	Operating mode with AR	without consideration of 52 closing time	A
3511	Maximum voltage difference	10,0 V	A
3512	Maximum frequency difference	0,10 Hz	A
3513	Maximum angle difference	10 °	A
3515A	79 at Vsy2>, Vsy1>, and Synchr.	YES	A
3516	79 at Vsy1< and Vsy2>	NO	A
3517	79 at Vsy1> and Vsy2<	NO	A
3518	79 at Vsy1< and Vsy2<	NO	A
3519	Override of any check before 79	NO	A

3.32 Grupo 25 Synchronism and Voltage Check; Grupo Man.Close+CNTRL

Grupo 25 Synchronism and Voltage Check; Grupo Man.Close+CNTRL

Nº	Parámetro	Valor	Grupo
3530	Operating mode with Man.Cl	without consideration of 52 closing time	A
3531	Maximum voltage difference	5,0 V	A
3532	Maximum frequency difference	0,10 Hz	A
3533	Maximum angle difference	10 °	A
3535A	Manual Close at Vsy2>, Vsy1>, and Synchr	NO	A
3536	Manual Close at Vsy1< and Vsy2>	NO	A
3537	Manual Close at Vsy1> and Vsy2<	NO	A
3538	Manual Close at Vsy1< and Vsy2<	NO	A
3539	Override of any check before Man.Cl	NO	A

3.33 Grupo Fault Locator

Grupo Fault Locator

Nº	Parámetro	Valor	Grupo
3802	Start fault locator with	TRIP	A
3806	Load Compensation	NO	A

3.34 Grupo 50BF Breaker Failure; Grupo 50BF

Grupo 50BF Breaker Failure; Grupo 50BF

Nº	Parámetro	Valor	Grupo
3901	50BF Breaker Failure Protection	ON	A
3902	50BF Pickup current threshold	1,67 A	A
3904	Delay after 1pole start for local trip	0,01 sec	A
3905	Delay after 3pole start for local trip	0,01 sec	A
3906	Delay of 2nd element for busbar trip	0,20 sec	A
3907	Delay for start with defective bkr.	0,00 sec	A
3908	Trip output selection with defective bkr	NO	A
3909	Check Breaker contacts	YES	A

3.35 Grupo 50BF Breaker Failure; Grupo End fault prot.

Grupo 50BF Breaker Failure; Grupo End fault prot.

Nº	Parámetro	Valor	Grupo
3921	End fault element	OFF	A
3922	Trip delay of end fault element	2,00 sec	A

3.36 Grupo 50BF Breaker Failure; Grupo PoleDiscrepancy

Grupo 50BF Breaker Failure; Grupo PoleDiscrepancy

Nº	Parámetro	Valor	Grupo
3931	Pole Discrepancy supervision	OFF	A
3932	Trip delay with pole discrepancy	2,00 sec	A

3.37 Grupo Power System Data 2; Grupo Power System

Grupo Power System Data 2; Grupo Power System

Nº	Parámetro	Valor	Grupo
1103	Measurement: Full Scale Voltage (100%)	154,0 kV	B
1104	Measurement: Full Scale Current (100%)	600 A	B
1105	Line Angle	79 °	B
1211	Angle of inclination, distance charact.	79 °	B
1107	P,Q operational measured values sign	not reversed	B
1110	x' - Line Reactance per length unit	0,0352 Ohm / km	B
1111	Line Length	60,6 km	B
1120	Zero seq. comp. factor K0 for zone Z1	0,809	B
1121	Zero seq. comp. angle for zone Z1	3,02 °	B
1122	Zero seq.comp.factor K0,higher zones >Z1	0,809	B
1123	Zero seq. comp. angle, higher zones >Z1	3,02 °	B

3.38 Grupo Power System Data 2; Grupo Line Status

Grupo Power System Data 2; Grupo Line Status

Nº	Parámetro	Valor	Grupo
1130A	Pole Open Current Threshold	0,50 A	B
1131A	Pole Open Voltage Threshold	11 V	B
1132A	Seal-in Time after ALL closures	0,20 sec	B
1134	Recognition of Line Closures with	CBpos(52a) OR Current or Manual close BI	B
1135	RESET of Trip Command	with CB(52a) AND I < PoleOpenCurrent	B
1140A	CT Saturation Threshold	100,0 A	B
1150A	Seal-in Time after MANUAL closures	0,20 sec	B
1151	Manual CLOSE COMMAND generation	NO	B
1152	MANUAL Closure Impulse after CONTROL	<none>	todo

3.39 Grupo 21 Distance protection, general settings; Grupo General

Grupo 21 Distance protection, general settings; Grupo General

Nº	Parámetro	Valor	Grupo
1201	21 Distance protection is	ON	B
1202	Phase Current threshold for dist. meas.	0,50 A	B
1211	Angle of inclination, distance charact.	79 °	B
1208	Series compensated line	NO	B
1232	Instantaneous trip after SwitchOnToFault	with Zone Z1B	B
1241	R load, minimum Load Impedance (ph-g)	oo Ohm	B
1242	PHI load, maximum Load Angle (ph-g)	30 °	B
1243	R load, minimum Load Impedance (ph-ph)	oo Ohm	B
1244	PHI load, maximum Load Angle (ph-ph)	30 °	B
1357	Z1B enabled before 1st AR (int. or ext.)	NO	B

3.40 Grupo 21 Distance protection, general settings; Grupo Ground faults

Grupo 21 Distance protection, general settings; Grupo Ground faults

Nº	Parámetro	Valor	Grupo
1203	3I0 threshold for neutral current pickup	0,50 A	B
1204	3V0 threshold zero seq. voltage pickup	oo V	B
1207A	3I0>-pickup-stabilisation (3I0>/ Iphmax)	0,10	B
1209A	Criterion of ground fault recognition	3I0> OR 3V0>	B
1221A	Loop selection with 2Ph-G faults	all loops	B

3.41 Grupo 21 Distance protection, general settings; Grupo Time Delays

Grupo 21 Distance protection, general settings; Grupo Time Delays

Nº	Parámetro	Valor	Grupo
1210	21 Condition for zone timer start	with distance pickup	B
1305	T1-1phase, delay for single phase faults	0,00 sec	B
1306	T1multi-ph, delay for multi phase faults	0,00 sec	B
1315	T2-1phase, delay for single phase faults	0,40 sec	B
1316	T2multi-ph, delay for multi phase faults	0,40 sec	B
1325	T3 delay	2,00 sec	B
1335	T4 delay	2,00 sec	B
1345	T5 delay	oo sec	B
1355	T1B-1phase, delay for single ph. faults	0,00 sec	B
1356	T1B-multi-ph, delay for multi ph. faults	0,00 sec	B

3.42 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1

Nº	Parámetro	Valor	Grupo
1301	Operating mode Z1	Forward	B
1302	R(Z1), Resistance for ph-ph-faults	1,720 Ohm	B
1303	X(Z1), Reactance	1,720 Ohm	B
1304	RG(Z1), Resistance for ph-gnd faults	3,440 Ohm	B
1305	T1-1phase, delay for single phase faults	0,00 sec	B
1306	T1multi-ph, delay for multi phase faults	0,00 sec	B
1307	Zone Reduction Angle (load compensation)	0 °	B

3.43 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1B-exten.

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1B-exten.

Nº	Parámetro	Valor	Grupo
1351	Operating mode Z1B (overrreach zone)	Forward	B
1352	R(Z1B), Resistance for ph-ph-faults	3,200 Ohm	B
1353	X(Z1B), Reactance	3,200 Ohm	B
1354	RG(Z1B), Resistance for ph-gnd faults	6,400 Ohm	B
1355	T1B-1phase, delay for single ph. faults	0,00 sec	B
1356	T1B-multi-ph, delay for multi ph. faults	0,00 sec	B
1357	Z1B enabled before 1st AR (int. or ext.)	NO	B

3.44 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z2

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z2

Nº	Parámetro	Valor	Grupo
1311	Operating mode Z2	Forward	B
1312	R(Z2), Resistance for ph-ph-faults	3,200 Ohm	B
1313	X(Z2), Reactance	3,200 Ohm	B
1314	RG(Z2), Resistance for ph-gnd faults	6,400 Ohm	B
1315	T2-1phase, delay for single phase faults	0,40 sec	B
1316	T2multi-ph, delay for multi phase faults	0,40 sec	B

3.45 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z3

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z3

Nº	Parámetro	Valor	Grupo
1321	Operating mode Z3	Reverse	B
1322	R(Z3), Resistance for ph-ph-faults	0,800 Ohm	B
1323	X(Z3), Reactance	0,800 Ohm	B
1324	RG(Z3), Resistance for ph-gnd faults	1,300 Ohm	B
1325	T3 delay	2,00 sec	B

3.46 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z4

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z4

Nº	Parámetro	Valor	Grupo
1331	Operating mode Z4	Forward	B
1332	R(Z4), Resistance for ph-ph-faults	4,400 Ohm	B
1333	X(Z4), Reactance	4,400 Ohm	B
1334	RG(Z4), Resistance for ph-gnd faults	8,800 Ohm	B
1335	T4 delay	2,00 sec	B

3.47 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z5

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z5

Nº	Parámetro	Valor	Grupo
1341	Operating mode Z5	Non-Directional	B
1342	R(Z5), Resistance for ph-ph-faults	4,420 Ohm	B
1343	X(Z5)+, Reactance for Forward direction	4,420 Ohm	B
1344	RG(Z5), Resistance for ph-gnd faults	8,820 Ohm	B
1345	T5 delay	oo sec	B
1346	X(Z5)-, Reactance for Reverse direction	3,200 Ohm	B

3.48 Grupo 68 Power Swing detection

Grupo 68 Power Swing detection

Nº	Parámetro	Valor	Grupo
2002	Power Swing Operating mode	all zones blocked	B
2006	68T Power swing trip	NO	B
2007	68 Trip delay after Power Swing Blocking	0,08 sec	B

3.49 Grupo 85-21 Pilot Prot. for Distance prot.

Grupo 85-21 Pilot Prot. for Distance prot.

Nº	Parámetro	Valor	Grupo
2101	85-21 Pilot Prot. for Distance prot.	ON	B
2102	Type of Line	Two Terminals	B
2103A	Time for send signal prolongation	0,08 sec	B
2109A	Transient Block.: Duration external flt.	0,03 sec	B
2110A	Transient Block.: Blk.T. after ext. flt.	0,15 sec	B

3.50 Grupo 50HS Instantaneous SOTF

Grupo 50HS Instantaneous SOTF

Nº	Parámetro	Valor	Grupo
2401	50HS Instantaneous SOTF-O/C is	ON	B
2404	50HS SOTF-O/C PICKUP	12,50 A	B

3.51 Grupo Weak Infeed (Trip and/or Echo)

Grupo Weak Infeed (Trip and/or Echo)

Nº	Parámetro	Valor	Grupo
2501	Weak Infeed option	Echo only	B
2502A	Trip / Echo Delay after carrier receipt	0,04 sec	B
2503A	Trip Extension / Echo Impulse time	0,05 sec	B
2504A	Echo Block Time	0,50 sec	B
2505	Undervoltage (ph-g)	25 V	B
2509	Echo logic: 21 and 67N on common channel	NO	todo

3.52 Grupo 50(N)/51(N) Backup OverCurrent; Grupo General

Grupo 50(N)/51(N) Backup OverCurrent; Grupo General

Nº	Parámetro	Valor	Grupo
2601	Operating mode	ON:only active with Loss of VT sec. cir.	B
2680	Trip time delay after SOTF	0,00 sec	B

3.53 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B1

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B1

Nº	Parámetro	Valor	Grupo
2610	50-B1 Pickup	23,00 A	B
2611	50-B1 Delay	0,01 sec	B
2612	50N-B1 Pickup	15,00 A	B
2613	50N-B1 Delay	0,02 sec	B
2614	Instantaneous trip via BI	NO	B
2615	Instantaneous trip after SwitchOnToFault	NO	B

3.54 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B2

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B2

Nº	Parámetro	Valor	Grupo
2620	50-B2 Pickup	6,15 A	B
2621	50-B2 Delay	oo sec	B
2622	50N-B2 Pickup	11,67 A	B
2623	50N-B2 Delay	oo sec	B
2624	Instantaneous trip via Pilot Prot./BI	NO	B
2625	Instantaneous trip after SwitchOnToFault	NO	B

3.55 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 51(N)-B

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 51(N)-B

Nº	Parámetro	Valor	Grupo
2640	51-B Pickup	6,00 A	B
2642	51-B Time Dial	0,22 sec	B
2646	51-B Additional Time Delay	0,00 sec	B
2650	51N-B Pickup	2,40 A	B
2652	51N-B Time Dial	0,12 sec	B
2656	51N-B Additional Time Delay	0,00 sec	B
2660	IEC Curve	Normal Inverse	B
2670	Instantaneous trip via Pilot Prot./BI	NO	B

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 51(N)-B(2)

Nº	Parámetro	Valor	Grupo
2671	Instantaneous trip after SwitchOnToFault	NO	B

3.56 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-STUB

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-STUB

Nº	Parámetro	Valor	Grupo
2630	50-STUB Pickup	15,00 A	B
2631	50-STUB Delay	oo sec	B
2632	50N-STUB Pickup	11,67 A	B
2633	50N-STUB Delay	oo sec	B
2634	Instantaneous trip via Pilot Prot./BI	NO	B
2635	Instantaneous trip after SwitchOnToFault	NO	B

3.57 Grupo Measurement Supervision; Grupo Balance / Summ.

Grupo Measurement Supervision; Grupo Balance / Summ.

Nº	Parámetro	Valor	Grupo
2901	Measurement Supervision	ON	B
2902A	Voltage Threshold for Balance Monitoring	50 V	B
2903A	Balance Factor for Voltage Monitor	0,75	B
2904A	Current Threshold for Balance Monitoring	0,50 A	B
2905A	Balance Factor for Current Monitor	0,50	B
2906A	Summated Current Monitoring Threshold	0,50 A	B
2907A	Summated Current Monitoring Factor	0,10	B
2908A	T Balance Factor for Voltage Monitor	5 sec	B
2909A	T Current Balance Monitor	5 sec	B

3.58 Grupo Measurement Supervision; Grupo Meas.Volt.Fail

Grupo Measurement Supervision; Grupo Meas.Volt.Fail

Nº	Parámetro	Valor	Grupo
2910	Fuse Failure Monitor	ON	B
2911A	Minimum Voltage Threshold V>	30 V	B
2912A	Maximum Current Threshold I<	0,50 A	B
2913A	Maximum Voltage Threshold V< (3phase)	5 V	B
2914A	Differential Current Threshold (3phase)	0,50 A	B
2915	Voltage Failure Supervision	with current superv. and CBpos(52a)	B
2916A	Delay Voltage Failure Supervision	3,00 sec	B

3.59 Grupo Measurement Supervision; Grupo VT mcb

Grupo Measurement Supervision; Grupo VT mcb

Nº	Parámetro	Valor	Grupo
2921	VT mcb operating time	5 ms	B

3.60 Grupo 50N/51N Ground OverCurrent; Grupo General

Grupo 50N/51N Ground OverCurrent; Grupo General

Nº	Parámetro	Valor	Grupo
3101	50N/51N Ground Overcurrent	ON	B
3102	Block 50N/51N for Distance protection	NO	B
3174	Block 50N/51N for Pickup 21	in each zone	B
3104A	Stabilisation Slope with Iphase	10 %	B
3170	2nd harmonic ratio for inrush restraint	15 %	B
3171	Max.Current, overriding inrush restraint	37,50 A	B
3172	Instantaneous mode after SwitchOnToFault	with Pickup and direction	B
3173	Trip time delay after SOTF	0,00 sec	B

3.61 Grupo 50N/51N Ground OverCurrent; Grupo 50N-1

Grupo 50N/51N Ground OverCurrent; Grupo 50N-1

Nº	Parámetro	Valor	Grupo
3110	Operating mode	Forward	B
3111	Pickup	15,00 A	B
3112	Time Delay	0,03 sec	B
3113	Instantaneous trip via Pilot Prot./BI	NO	B
3114	Instantaneous trip after SwitchOnToFault	NO	B
3115	Inrush Blocking	NO	B

3.62 Grupo 50N/51N Ground OverCurrent; Grupo 50N-2

Grupo 50N/51N Ground OverCurrent; Grupo 50N-2

Nº	Parámetro	Valor	Grupo
3120	Operating mode	Inactive	B
3121	Pickup	0,83 A	B
3122	Time Delay	0,60 sec	B
3123	Instantaneous trip via Pilot Prot./BI	NO	B
3124	Instantaneous trip after SwitchOnToFault	NO	B
3125	Inrush Blocking	NO	B

3.63 Grupo 50N/51N Ground OverCurrent; Grupo 50N-3

Grupo 50N/51N Ground OverCurrent; Grupo 50N-3

Nº	Parámetro	Valor	Grupo
3130	Operating mode	Inactive	B
3131	Pickup	0,83 A	B
3132	Time Delay	0,90 sec	B
3133	Instantaneous trip via Pilot Prot./BI	NO	B
3134	Instantaneous trip after SwitchOnToFault	NO	B
3135	Inrush Blocking	NO	B

3.64 Grupo 50N/51N Ground OverCurrent; Grupo 51N InverseTime

Grupo 50N/51N Ground OverCurrent; Grupo 51N InverseTime

Nº	Parámetro	Valor	Grupo
3140	Operating mode	Forward	B
3141	Pickup	2,40 A	B
3143	Time Dial	0,13 sec	B
3147	Additional Time Delay	0,00 sec	B
3148	Instantaneous trip via Pilot Prot./BI	NO	B
3149	Instantaneous trip after SwitchOnToFault	NO	B
3150	Inrush Blocking	NO	B
3151	IEC Curve	Normal Inverse	B

3.65 Grupo 50N/51N Ground OverCurrent; Grupo Direction

Grupo 50N/51N Ground OverCurrent; Grupo Direction

Nº	Parámetro	Valor	Grupo
3160	Polarization	with Vo + Ig or V2	B
3162A	ALPHA, lower angle for forward direction	338 °	B
3163A	BETA, upper angle for forward direction	122 °	B
3164	Min. zero seq.voltage 3Vo for polarizing	3,0 V	B
3166	Min. neg. seq. polarizing voltage 3V2	3,0 V	B
3167	Min. neg. seq. polarizing current 3I2	0,25 A	B
3168	Compensation angle PHI comp. for Sr	255 °	B
3169	Forward direction power threshold	1,5 VA	B

3.66 Grupo 25 Synchronism and Voltage Check; Grupo General

Grupo 25 Synchronism and Voltage Check; Grupo General

Nº	Parámetro	Valor	Grupo
3501	25 Synchronism and Voltage Check	ON	B
3502	Voltage threshold dead line / bus	10 V	B
3503	Voltage threshold live line / bus	44 V	B
3504	Maximum permissible voltage	70 V	B
3507	Maximum duration of synchronism-check	1,00 sec	B
3508	Synchronous condition stability timer	0,00 sec	B
3509	Synchronizable circuit breaker	<none>	todo

3.67 Grupo 25 Synchronism and Voltage Check; Grupo with AR

Grupo 25 Synchronism and Voltage Check; Grupo with AR

Nº	Parámetro	Valor	Grupo
3510	Operating mode with AR	without consideration of 52 closing time	B
3511	Maximum voltage difference	10,0 V	B
3512	Maximum frequency difference	0,10 Hz	B
3513	Maximum angle difference	10 °	B
3515A	79 at Vsy2>, Vsy1>, and Synchr.	YES	B
3516	79 at Vsy1< and Vsy2>	NO	B
3517	79 at Vsy1> and Vsy2<	NO	B
3518	79 at Vsy1< and Vsy2<	NO	B
3519	Override of any check before 79	NO	B

3.68 Grupo 25 Synchronism and Voltage Check; Grupo Man.Close+CNTRL

Grupo 25 Synchronism and Voltage Check; Grupo Man.Close+CNTRL

Nº	Parámetro	Valor	Grupo
3530	Operating mode with Man.Cl	without consideration of 52 closing time	B
3531	Maximum voltage difference	10,0 V	B
3532	Maximum frequency difference	0,10 Hz	B
3533	Maximum angle difference	10 °	B
3535A	Manual Close at Vsy2>, Vsy1>, and Synchr	NO	B
3536	Manual Close at Vsy1< and Vsy2>	NO	B
3537	Manual Close at Vsy1> and Vsy2<	NO	B
3538	Manual Close at Vsy1< and Vsy2<	NO	B
3539	Override of any check before Man.Cl	NO	B

3.69 Grupo Fault Locator

Grupo Fault Locator

Nº	Parámetro	Valor	Grupo
3802	Start fault locator with	TRIP	B
3806	Load Compensation	NO	B

3.70 Grupo 50BF Breaker Failure; Grupo 50BF

Grupo 50BF Breaker Failure; Grupo 50BF

Nº	Parámetro	Valor	Grupo
3901	50BF Breaker Failure Protection	ON	B
3902	50BF Pickup current threshold	6,00 A	B
3904	Delay after 1pole start for local trip	0,02 sec	B
3905	Delay after 3pole start for local trip	0,02 sec	B
3906	Delay of 2nd element for busbar trip	0,20 sec	B
3907	Delay for start with defective bkr.	0,00 sec	B
3908	Trip output selection with defective bkr	NO	B
3909	Check Breaker contacts	YES	B

3.71 Grupo 50BF Breaker Failure; Grupo End fault prot.

Grupo 50BF Breaker Failure; Grupo End fault prot.

Nº	Parámetro	Valor	Grupo
3921	End fault element	OFF	B
3922	Trip delay of end fault element	2,00 sec	B

3.72 Grupo 50BF Breaker Failure; Grupo PoleDiscrepancy

Grupo 50BF Breaker Failure; Grupo PoleDiscrepancy

Nº	Parámetro	Valor	Grupo
3931	Pole Discrepancy supervision	OFF	B
3932	Trip delay with pole discrepancy	2,00 sec	B

3.73 Grupo Power System Data 2; Grupo Power System

Grupo Power System Data 2; Grupo Power System

Nº	Parámetro	Valor	Grupo
1103	Measurement: Full Scale Voltage (100%)	154,0 kV	C
1104	Measurement: Full Scale Current (100%)	600 A	C
1105	Line Angle	79 °	C
1211	Angle of inclination, distance charact.	79 °	C
1107	P,Q operational measured values sign	not reversed	C
1110	x' - Line Reactance per length unit	0,0352 Ohm / km	C
1111	Line Length	60,6 km	C
1120	Zero seq. comp. factor K0 for zone Z1	0,809	C
1121	Zero seq. comp. angle for zone Z1	3,02 °	C
1122	Zero seq.comp.factor K0,higher zones >Z1	0,809	C
1123	Zero seq. comp. angle, higher zones >Z1	3,02 °	C

3.74 Grupo Power System Data 2; Grupo Line Status

Grupo Power System Data 2; Grupo Line Status

Nº	Parámetro	Valor	Grupo
1130A	Pole Open Current Threshold	0,50 A	C
1131A	Pole Open Voltage Threshold	11 V	C
1132A	Seal-in Time after ALL closures	0,20 sec	C
1134	Recognition of Line Closures with	CBpos(52a) OR Current or Manual close BI	C
1135	RESET of Trip Command	with CB(52a) AND I < PoleOpenCurrent	C
1140A	CT Saturation Threshold	100,0 A	C
1150A	Seal-in Time after MANUAL closures	0,20 sec	C
1151	Manual CLOSE COMMAND generation	NO	C
1152	MANUAL Closure Impulse after CONTROL	<none>	todo

3.75 Grupo 21 Distance protection, general settings; Grupo General

Grupo 21 Distance protection, general settings; Grupo General

Nº	Parámetro	Valor	Grupo
1201	21 Distance protection is	ON	C
1202	Phase Current threshold for dist. meas.	0,50 A	C
1211	Angle of inclination, distance charact.	79 °	C
1208	Series compensated line	NO	C
1232	Instantaneous trip after SwitchOnToFault	with Zone Z1B	C
1241	R load, minimum Load Impedance (ph-g)	oo Ohm	C
1242	PHI load, maximum Load Angle (ph-g)	30 °	C
1243	R load, minimum Load Impedance (ph-ph)	oo Ohm	C
1244	PHI load, maximum Load Angle (ph-ph)	30 °	C
1357	Z1B enabled before 1st AR (int. or ext.)	YES	C

3.76 Grupo 21 Distance protection, general settings; Grupo Ground faults

Grupo 21 Distance protection, general settings; Grupo Ground faults

Nº	Parámetro	Valor	Grupo
1203	3I0 threshold for neutral current pickup	0,50 A	C
1204	3V0 threshold zero seq. voltage pickup	oo V	C
1207A	3I0>-pickup-stabilisation (3I0>/ Iphmax)	0,10	C
1209A	Criterion of ground fault recognition	3I0> OR 3V0>	C
1221A	Loop selection with 2Ph-G faults	all loops	C

3.77 Grupo 21 Distance protection, general settings; Grupo Time Delays

Grupo 21 Distance protection, general settings; Grupo Time Delays

Nº	Parámetro	Valor	Grupo
1210	21 Condition for zone timer start	with distance pickup	C
1305	T1-1phase, delay for single phase faults	0,00 sec	C
1306	T1multi-ph, delay for multi phase faults	0,00 sec	C
1315	T2-1phase, delay for single phase faults	0,60 sec	C
1316	T2multi-ph, delay for multi phase faults	0,60 sec	C
1325	T3 delay	2,00 sec	C
1335	T4 delay	2,00 sec	C
1345	T5 delay	oo sec	C
1355	T1B-1phase, delay for single ph. faults	0,00 sec	C
1356	T1B-multi-ph, delay for multi ph. faults	0,00 sec	C

3.78 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1

Nº	Parámetro	Valor	Grupo
1301	Operating mode Z1	Forward	C
1302	R(Z1), Resistance for ph-ph-faults	1,720 Ohm	C
1303	X(Z1), Reactance	1,720 Ohm	C
1304	RG(Z1), Resistance for ph-gnd faults	3,440 Ohm	C
1305	T1-1phase, delay for single phase faults	0,00 sec	C
1306	T1multi-ph, delay for multi phase faults	0,00 sec	C
1307	Zone Reduction Angle (load compensation)	0 °	C

3.79 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1B-exten.

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1B-exten.

Nº	Parámetro	Valor	Grupo
1351	Operating mode Z1B (overrreach zone)	Forward	C
1352	R(Z1B), Resistance for ph-ph-faults	5,400 Ohm	C
1353	X(Z1B), Reactance	5,400 Ohm	C
1354	RG(Z1B), Resistance for ph-gnd faults	6,400 Ohm	C
1355	T1B-1phase, delay for single ph. faults	0,00 sec	C
1356	T1B-multi-ph, delay for multi ph. faults	0,00 sec	C
1357	Z1B enabled before 1st AR (int. or ext.)	YES	C

3.80 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z2

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z2

Nº	Parámetro	Valor	Grupo
1311	Operating mode Z2	Forward	C
1312	R(Z2), Resistance for ph-ph-faults	3,600 Ohm	C
1313	X(Z2), Reactance	3,600 Ohm	C
1314	RG(Z2), Resistance for ph-gnd faults	6,400 Ohm	C
1315	T2-1phase, delay for single phase faults	0,60 sec	C
1316	T2multi-ph, delay for multi phase faults	0,60 sec	C

3.81 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z3

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z3

Nº	Parámetro	Valor	Grupo
1321	Operating mode Z3	Reverse	C
1322	R(Z3), Resistance for ph-ph-faults	2,000 Ohm	C
1323	X(Z3), Reactance	2,000 Ohm	C
1324	RG(Z3), Resistance for ph-gnd faults	2,000 Ohm	C
1325	T3 delay	2,00 sec	C

3.82 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z4

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z4

Nº	Parámetro	Valor	Grupo
1331	Operating mode Z4	Forward	C
1332	R(Z4), Resistance for ph-ph-faults	4,400 Ohm	C
1333	X(Z4), Reactance	4,400 Ohm	C
1334	RG(Z4), Resistance for ph-gnd faults	8,800 Ohm	C
1335	T4 delay	2,00 sec	C

3.83 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z5

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z5

Nº	Parámetro	Valor	Grupo
1341	Operating mode Z5	Non-Directional	C
1342	R(Z5), Resistance for ph-ph-faults	4,420 Ohm	C
1343	X(Z5)+, Reactance for Forward direction	4,420 Ohm	C
1344	RG(Z5), Resistance for ph-gnd faults	8,820 Ohm	C
1345	T5 delay	oo sec	C
1346	X(Z5)-, Reactance for Reverse direction	3,200 Ohm	C

3.84 Grupo 68 Power Swing detection

Grupo 68 Power Swing detection

Nº	Parámetro	Valor	Grupo
2002	Power Swing Operating mode	all zones blocked	C
2006	68T Power swing trip	NO	C
2007	68 Trip delay after Power Swing Blocking	0,08 sec	C

3.85 Grupo 85-21 Pilot Prot. for Distance prot.

Grupo 85-21 Pilot Prot. for Distance prot.

Nº	Parámetro	Valor	Grupo
2101	85-21 Pilot Prot. for Distance prot.	ON	C
2102	Type of Line	Two Terminals	C
2103A	Time for send signal prolongation	0,08 sec	C
2109A	Transient Block.: Duration external flt.	0,03 sec	C
2110A	Transient Block.: Blk.T. after ext. flt.	0,15 sec	C

3.86 Grupo 50HS Instantaneous SOTF

Grupo 50HS Instantaneous SOTF

Nº	Parámetro	Valor	Grupo
2401	50HS Instantaneous SOTF-O/C is	ON	C

Grupo 50HS Instantaneous SOTF(2)

Nº	Parámetro	Valor	Grupo
2404	50HS SOTF-O/C PICKUP	12,50 A	C

3.87 Grupo Weak Infeed (Trip and/or Echo)

Grupo Weak Infeed (Trip and/or Echo)

Nº	Parámetro	Valor	Grupo
2501	Weak Infeed option	Echo only	C
2502A	Trip / Echo Delay after carrier receipt	0,04 sec	C
2503A	Trip Extension / Echo Impulse time	0,05 sec	C
2504A	Echo Block Time	0,50 sec	C
2505	Undervoltage (ph-g)	25 V	C
2509	Echo logic: 21 and 67N on common channel	NO	todo

3.88 Grupo 50(N)/51(N) Backup OverCurrent; Grupo General

Grupo 50(N)/51(N) Backup OverCurrent; Grupo General

Nº	Parámetro	Valor	Grupo
2601	Operating mode	ON:only active with Loss of VT sec. cir.	C
2680	Trip time delay after SOTF	0,00 sec	C

3.89 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B1

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B1

Nº	Parámetro	Valor	Grupo
2610	50-B1 Pickup	23,00 A	C
2611	50-B1 Delay	0,01 sec	C
2612	50N-B1 Pickup	15,00 A	C
2613	50N-B1 Delay	0,02 sec	C
2614	Instantaneous trip via BI	NO	C
2615	Instantaneous trip after SwitchOnToFault	NO	C

3.90 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B2

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B2

Nº	Parámetro	Valor	Grupo
2620	50-B2 Pickup	6,15 A	C
2621	50-B2 Delay	oo sec	C
2622	50N-B2 Pickup	11,67 A	C
2623	50N-B2 Delay	oo sec	C
2624	Instantaneous trip via Pilot Prot./BI	NO	C
2625	Instantaneous trip after SwitchOnToFault	NO	C

3.91 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 51(N)-B

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 51(N)-B

Nº	Parámetro	Valor	Grupo
2640	51-B Pickup	6,00 A	C
2642	51-B Time Dial	0,22 sec	C
2646	51-B Additional Time Delay	0,00 sec	C
2650	51N-B Pickup	2,40 A	C
2652	51N-B Time Dial	0,12 sec	C
2656	51N-B Additional Time Delay	0,00 sec	C
2660	IEC Curve	Normal Inverse	C
2670	Instantaneous trip via Pilot Prot./BI	NO	C
2671	Instantaneous trip after SwitchOnToFault	NO	C

3.92 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-STUB

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-STUB

Nº	Parámetro	Valor	Grupo
2630	50-STUB Pickup	15,00 A	C
2631	50-STUB Delay	oo sec	C
2632	50N-STUB Pickup	11,67 A	C
2633	50N-STUB Delay	oo sec	C
2634	Instantaneous trip via Pilot Prot./BI	NO	C
2635	Instantaneous trip after SwitchOnToFault	NO	C

3.93 Grupo Measurement Supervision; Grupo Balance / Summ.

Grupo Measurement Supervision; Grupo Balance / Summ.

Nº	Parámetro	Valor	Grupo
2901	Measurement Supervision	ON	C
2902A	Voltage Threshold for Balance Monitoring	50 V	C
2903A	Balance Factor for Voltage Monitor	0,75	C
2904A	Current Threshold for Balance Monitoring	0,50 A	C
2905A	Balance Factor for Current Monitor	0,50	C
2906A	Summated Current Monitoring Threshold	0,50 A	C
2907A	Summated Current Monitoring Factor	0,10	C
2908A	T Balance Factor for Voltage Monitor	5 sec	C
2909A	T Current Balance Monitor	5 sec	C

3.94 Grupo Measurement Supervision; Grupo Meas.Volt.Fail

Grupo Measurement Supervision; Grupo Meas.Volt.Fail

Nº	Parámetro	Valor	Grupo
2910	Fuse Failure Monitor	ON	C
2911A	Minimum Voltage Threshold V>	30 V	C
2912A	Maximum Current Threshold I<	0,50 A	C
2913A	Maximum Voltage Threshold V< (3phase)	5 V	C
2914A	Differential Current Threshold (3phase)	0,50 A	C
2915	Voltage Failure Supervision	with current superv. and CBpos(52a)	C
2916A	Delay Voltage Failure Supervision	3,00 sec	C

3.95 Grupo Measurement Supervision; Grupo VT mcb

Grupo Measurement Supervision; Grupo VT mcb

Nº	Parámetro	Valor	Grupo
2921	VT mcb operating time	5 ms	C

3.96 Grupo 50N/51N Ground OverCurrent; Grupo General

Grupo 50N/51N Ground OverCurrent; Grupo General

Nº	Parámetro	Valor	Grupo
3101	50N/51N Ground Overcurrent	ON	C
3102	Block 50N/51N for Distance protection	NO	C
3174	Block 50N/51N for Pickup 21	in each zone	C
3104A	Stabilisation Slope with Iphase	10 %	C
3170	2nd harmonic ratio for inrush restraint	15 %	C
3171	Max.Current, overriding inrush restraint	37,50 A	C
3172	Instantaneous mode after SwitchOnToFault	with Pickup and direction	C
3173	Trip time delay after SOTF	0,00 sec	C

3.97 Grupo 50N/51N Ground OverCurrent; Grupo 50N-1

Grupo 50N/51N Ground OverCurrent; Grupo 50N-1

Nº	Parámetro	Valor	Grupo
3110	Operating mode	Forward	C
3111	Pickup	15,00 A	C
3112	Time Delay	0,03 sec	C
3113	Instantaneous trip via Pilot Prot./BI	NO	C
3114	Instantaneous trip after SwitchOnToFault	NO	C
3115	Inrush Blocking	NO	C

3.98 Grupo 50N/51N Ground OverCurrent; Grupo 50N-2

Grupo 50N/51N Ground OverCurrent; Grupo 50N-2

Nº	Parámetro	Valor	Grupo
3120	Operating mode	Inactive	C
3121	Pickup	0,83 A	C
3122	Time Delay	0,60 sec	C
3123	Instantaneous trip via Pilot Prot./BI	NO	C
3124	Instantaneous trip after SwitchOnToFault	NO	C
3125	Inrush Blocking	NO	C

3.99 Grupo 50N/51N Ground OverCurrent; Grupo 50N-3

Grupo 50N/51N Ground OverCurrent; Grupo 50N-3

Nº	Parámetro	Valor	Grupo
3130	Operating mode	Inactive	C
3131	Pickup	0,83 A	C
3132	Time Delay	0,90 sec	C
3133	Instantaneous trip via Pilot Prot./BI	NO	C
3134	Instantaneous trip after SwitchOnToFault	NO	C
3135	Inrush Blocking	NO	C

3.100 Grupo 50N/51N Ground OverCurrent; Grupo 51N InverseTime

Grupo 50N/51N Ground OverCurrent; Grupo 51N InverseTime

Nº	Parámetro	Valor	Grupo
3140	Operating mode	Forward	C
3141	Pickup	2,40 A	C
3143	Time Dial	0,13 sec	C
3147	Additional Time Delay	0,00 sec	C
3148	Instantaneous trip via Pilot Prot./BI	NO	C
3149	Instantaneous trip after SwitchOnToFault	NO	C
3150	Inrush Blocking	NO	C
3151	IEC Curve	Normal Inverse	C

3.101 Grupo 50N/51N Ground OverCurrent; Grupo Direction

Grupo 50N/51N Ground OverCurrent; Grupo Direction

Nº	Parámetro	Valor	Grupo
3160	Polarization	with Vo + Ig or V2	C
3162A	ALPHA, lower angle for forward direction	338 °	C
3163A	BETA, upper angle for forward direction	122 °	C
3164	Min. zero seq.voltage 3Vo for polarizing	3,0 V	C
3166	Min. neg. seq. polarizing voltage 3V2	3,0 V	C
3167	Min. neg. seq. polarizing current 3I2	0,25 A	C
3168	Compensation angle PHI comp. for Sr	255 °	C
3169	Forward direction power threshold	1,5 VA	C

3.102 Grupo 25 Synchronism and Voltage Check; Grupo General

Grupo 25 Synchronism and Voltage Check; Grupo General

Nº	Parámetro	Valor	Grupo
3501	25 Synchronism and Voltage Check	ON	C
3502	Voltage threshold dead line / bus	10 V	C
3503	Voltage threshold live line / bus	44 V	C
3504	Maximum permissible voltage	70 V	C
3507	Maximum duration of synchronism-check	1,00 sec	C
3508	Synchronous condition stability timer	0,00 sec	C
3509	Synchronizable circuit breaker	<none>	todo

3.103 Grupo 25 Synchronism and Voltage Check; Grupo with AR

Grupo 25 Synchronism and Voltage Check; Grupo with AR

Nº	Parámetro	Valor	Grupo
3510	Operating mode with AR	without consideration of 52 closing time	C
3511	Maximum voltage difference	10,0 V	C
3512	Maximum frequency difference	0,10 Hz	C
3513	Maximum angle difference	10 °	C
3515A	79 at Vsy2>, Vsy1>, and Synchr.	YES	C
3516	79 at Vsy1< and Vsy2>	NO	C
3517	79 at Vsy1> and Vsy2<	NO	C
3518	79 at Vsy1< and Vsy2<	NO	C
3519	Override of any check before 79	NO	C

3.104 Grupo 25 Synchronism and Voltage Check; Grupo Man.Close+CNTRL

Grupo 25 Synchronism and Voltage Check; Grupo Man.Close+CNTRL

Nº	Parámetro	Valor	Grupo
3530	Operating mode with Man.Cl	without consideration of 52 closing time	C
3531	Maximum voltage difference	10,0 V	C
3532	Maximum frequency difference	0,10 Hz	C
3533	Maximum angle difference	10 °	C
3535A	Manual Close at Vsy2>, Vsy1>, and Synchr	NO	C
3536	Manual Close at Vsy1< and Vsy2>	NO	C
3537	Manual Close at Vsy1> and Vsy2<	NO	C
3538	Manual Close at Vsy1< and Vsy2<	NO	C
3539	Override of any check before Man.Cl	NO	C

3.105 Grupo Fault Locator

Grupo Fault Locator

Nº	Parámetro	Valor	Grupo
3802	Start fault locator with	TRIP	C
3806	Load Compensation	NO	C

3.106 Grupo 50BF Breaker Failure; Grupo 50BF

Grupo 50BF Breaker Failure; Grupo 50BF

Nº	Parámetro	Valor	Grupo
3901	50BF Breaker Failure Protection	ON	C
3902	50BF Pickup current threshold	6,00 A	C
3904	Delay after 1pole start for local trip	0,02 sec	C
3905	Delay after 3pole start for local trip	0,02 sec	C
3906	Delay of 2nd element for busbar trip	0,20 sec	C
3907	Delay for start with defective bkr.	0,00 sec	C
3908	Trip output selection with defective bkr	NO	C
3909	Check Breaker contacts	YES	C

3.107 Grupo 50BF Breaker Failure; Grupo End fault prot.

Grupo 50BF Breaker Failure; Grupo End fault prot.

Nº	Parámetro	Valor	Grupo
3921	End fault element	OFF	C
3922	Trip delay of end fault element	2,00 sec	C

3.108 Grupo 50BF Breaker Failure; Grupo PoleDiscrepancy

Grupo 50BF Breaker Failure; Grupo PoleDiscrepancy

Nº	Parámetro	Valor	Grupo
3931	Pole Discrepancy supervision	OFF	C
3932	Trip delay with pole discrepancy	2,00 sec	C

4 Change Group

4.1 Grupo Change Group

Grupo Change Group

Nº	Parámetro	Valor	Grupo
0302	Change to Another Setting Group	Binary Input	todo

CONTROL DE REVISIÓN DEL CRAP

REVISOR	FECHA	N° EAP	OBSERVACIONES
Max Missene M.	07-09-2015	Nº 75/2015	Cambio de ajustes para evitar que la Z1B actúe de forma instantánea en Sistema 2 protección Siemens 7SA61 .

Razón de TTCC/TTPP

TTCC: 600/5

TTPP: $\frac{161000}{\sqrt{3}}/115/\frac{115}{\sqrt{3}}$

Particularidades de Ajustes

- No hay.

Max / Centro Sur / Rancagua / A2 Rancagua Var

MLFB:	7SA61255AE227PR4
Versión del juego de parámetros:	V04.34.03
Ruta del equipo:	C:\Siemens\Digsi4\D4PROJ\Max\P7DI\GV\ST\00000050
Autor:	
Creado el:	23.10.15 10:59:27
Mod. por última vez el:	23.10.15 10:59:58
Modo de operación:	Sin línea
Comentario:	
Valores de ajuste en:	Presentación secundaria de los valores

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1 Device Configuration

Nº	Función	Volumen
0103	Setting Group Change Option	Enabled
0110	Trip mode	3pole only
0114	21 Distance protection pickup program	Z< (quadrilateral)
0120	68 Power Swing detection	Enabled
0121	85-21 Pilot Protection for Distance prot	POTT
0122	DTT Direct Transfer Trip	Disabled
0124	50HS Instantaneous SOTF	Enabled
0125	Weak Infeed (Trip and/or Echo)	Enabled
0126	50(N)/51(N) Backup OverCurrent	Time Overcurrent Curve IEC
0131	50N/51N Ground OverCurrent	Time Overcurrent Curve IEC
0132	85-67N Pilot Protection Gnd. OverCurrent	Disabled
0133	79 Auto-Reclose Function	Disabled
0134	Auto-Reclose control mode	with Trip and Action time
0135	25 Synchronism and Voltage Check	Disabled
0136	81 Over/Underfrequency Protection	Disabled
0137	27, 59 Under/Overvoltage Protection	Disabled
0138	Fault Locator	Enabled
0139	50BF Breaker Failure Protection	Enabled
0140	74TC Trip Circuit Supervision	Disabled
0142	49 Thermal Overload Protection	Disabled

2 Power System Data 1

2.1 Grupo Power System Data 1; Grupo Transformers

Grupo Power System Data 1; Grupo Transformers

Nº	Parámetro	Valor	Grupo
0201	CT Starpoint	towards Line	todo
0203	Rated Primary Voltage	161,0 kV	todo
0204	Rated Secondary Voltage (Ph-Ph)	115 V	todo
0205	CT Rated Primary Current	600 A	todo
0206	CT Rated Secondary Current	5A	todo
0210	V4 voltage transformer is	not connected	todo
0211	Matching ratio Phase-VT To Open-Delta-VT	1,73	todo
0215	Matching ratio Vsy1 / Vsy2	0,58	todo
0220	I4 current transformer is	Neutral Current (of the protected line)	todo
0221	Matching ratio I4/Iph for CT's	1,000	todo

2.2 Grupo Power System Data 1; Grupo Power System

Grupo Power System Data 1; Grupo Power System

Nº	Parámetro	Valor	Grupo
0207	System Starpoint is	Solid Grounded	todo
0230	Rated Frequency	50 Hz	todo
0235	Phase Sequence	A B C	todo
0236	Distance measurement unit	km	todo
0237	Setting format for zero seq.comp. format	Zero seq. comp. factor K0 and angle(K0)	todo

2.3 Grupo Power System Data 1; Grupo Breaker

Grupo Power System Data 1; Grupo Breaker

Nº	Parámetro	Valor	Grupo
0240A	Minimum TRIP Command Duration	0,12 sec	todo
0241A	Maximum Close Command Duration	0,25 sec	todo
0242	Dead Time for CB test-autoreclosure	0,10 sec	todo

3 Grupos de parámetros

3.1 Grupo Power System Data 2; Grupo Power System

Grupo Power System Data 2; Grupo Power System

Nº	Parámetro	Valor	Grupo
1103	Measurement: Full Scale Voltage (100%)	161,0 kV	A
1104	Measurement: Full Scale Current (100%)	600 A	A
1105	Line Angle	79 °	A
1211	Angle of inclination, distance charact.	79 °	A
1107	P,Q operational measured values sign	not reversed	A
1110	x' - Line Reactance per length unit	0,0359 Ohm / km	A
1111	Line Length	50,6 km	A
1120	Zero seq. comp. factor K0 for zone Z1	0,809	A
1121	Zero seq. comp. angle for zone Z1	3,02 °	A
1122	Zero seq.comp.factor K0,higher zones >Z1	0,809	A
1123	Zero seq. comp. angle, higher zones >Z1	3,02 °	A

3.2 Grupo Power System Data 2; Grupo Line Status

Grupo Power System Data 2; Grupo Line Status

Nº	Parámetro	Valor	Grupo
1130A	Pole Open Current Threshold	0,25 A	A
1131A	Pole Open Voltage Threshold	11 V	A
1132A	Seal-in Time after ALL closures	0,20 sec	A
1134	Recognition of Line Closures with	CBpos(52a) OR Current or Manual close BI	A
1135	RESET of Trip Command	with Pole Open Current Threshold only	A
1140A	CT Saturation Threshold	100,0 A	A
1150A	Seal-in Time after MANUAL closures	0,20 sec	A
1151	Manual CLOSE COMMAND generation	NO	A
1152	MANUAL Closure Impulse after CONTROL	<none>	todo

3.3 Grupo 21 Distance protection, general settings; Grupo General

Grupo 21 Distance protection, general settings; Grupo General

Nº	Parámetro	Valor	Grupo
1201	21 Distance protection is	ON	A
1202	Phase Current threshold for dist. meas.	0,25 A	A
1211	Angle of inclination, distance charact.	79 °	A
1208	Series compensated line	NO	A
1232	Instantaneous trip after SwitchOnToFault	with Zone Z1B	A
1241	R load, minimum Load Impedance (ph-g)	9,140 Ohm	A
1242	PHI load, maximum Load Angle (ph-g)	35 °	A
1243	R load, minimum Load Impedance (ph-ph)	9,140 Ohm	A
1244	PHI load, maximum Load Angle (ph-ph)	35 °	A
1357	Z1B enabled before 1st AR (int. or ext.)	NO	A

3.4 Grupo 21 Distance protection, general settings; Grupo Ground faults

Grupo 21 Distance protection, general settings; Grupo Ground faults

Nº	Parámetro	Valor	Grupo
1203	3I0 threshold for neutral current pickup	0,25 A	A
1204	3V0 threshold zero seq. voltage pickup	2 V	A
1207A	3I0>-pickup-stabilisation (3I0>/ Iphmax)	0,10	A
1209A	Criterion of ground fault recognition	3I0> OR 3V0>	A
1221A	Loop selection with 2Ph-G faults	all loops	A

3.5 Grupo 21 Distance protection, general settings; Grupo Time Delays

Grupo 21 Distance protection, general settings; Grupo Time Delays

Nº	Parámetro	Valor	Grupo
1210	21 Condition for zone timer start	with distance pickup	A
1305	T1-1phase, delay for single phase faults	0,00 sec	A
1306	T1multi-ph, delay for multi phase faults	0,00 sec	A
1315	T2-1phase, delay for single phase faults	0,60 sec	A
1316	T2multi-ph, delay for multi phase faults	0,60 sec	A
1325	T3 delay	2,50 sec	A
1335	T4 delay	1,50 sec	A
1345	T5 delay	oo sec	A
1355	T1B-1phase, delay for single ph. faults	0,00 sec	A
1356	T1B-multi-ph, delay for multi ph. faults	0,00 sec	A

3.6 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1

Nº	Parámetro	Valor	Grupo
1301	Operating mode Z1	Forward	A
1302	R(Z1), Resistance for ph-ph-faults	2,740 Ohm	A
1303	X(Z1), Reactance	2,740 Ohm	A
1304	RG(Z1), Resistance for ph-gnd faults	2,740 Ohm	A
1305	T1-1phase, delay for single phase faults	0,00 sec	A
1306	T1multi-ph, delay for multi phase faults	0,00 sec	A
1307	Zone Reduction Angle (load compensation)	0 °	A

3.7 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1B-exten.

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1B-exten.

Nº	Parámetro	Valor	Grupo
1351	Operating mode Z1B (overrreach zone)	Forward	A
1352	R(Z1B), Resistance for ph-ph-faults	21,000 Ohm	A
1353	X(Z1B), Reactance	25,689 Ohm	A
1354	RG(Z1B), Resistance for ph-gnd faults	21,000 Ohm	A
1355	T1B-1phase, delay for single ph. faults	0,00 sec	A
1356	T1B-multi-ph, delay for multi ph. faults	0,00 sec	A
1357	Z1B enabled before 1st AR (int. or ext.)	NO	A

3.8 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z2

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z2

Nº	Parámetro	Valor	Grupo
1311	Operating mode Z2	Forward	A
1312	R(Z2), Resistance for ph-ph-faults	5,520 Ohm	A
1313	X(Z2), Reactance	5,520 Ohm	A
1314	RG(Z2), Resistance for ph-gnd faults	5,520 Ohm	A
1315	T2-1phase, delay for single phase faults	0,60 sec	A
1316	T2multi-ph, delay for multi phase faults	0,60 sec	A

3.9 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z3

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z3

Nº	Parámetro	Valor	Grupo
1321	Operating mode Z3	Reverse	A
1322	R(Z3), Resistance for ph-ph-faults	12,500 Ohm	A
1323	X(Z3), Reactance	12,500 Ohm	A
1324	RG(Z3), Resistance for ph-gnd faults	12,500 Ohm	A
1325	T3 delay	2,50 sec	A

3.10 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z4

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z4

Nº	Parámetro	Valor	Grupo
1331	Operating mode Z4	Forward	A
1332	R(Z4), Resistance for ph-ph-faults	13,000 Ohm	A
1333	X(Z4), Reactance	13,000 Ohm	A
1334	RG(Z4), Resistance for ph-gnd faults	13,000 Ohm	A
1335	T4 delay	1,50 sec	A

3.11 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z5

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z5

Nº	Parámetro	Valor	Grupo
1341	Operating mode Z5	Non-Directional	A
1342	R(Z5), Resistance for ph-ph-faults	14,000 Ohm	A
1343	X(Z5)+, Reactance for Forward direction	14,000 Ohm	A
1344	RG(Z5), Resistance for ph-gnd faults	14,000 Ohm	A
1345	T5 delay	oo sec	A
1346	X(Z5)-, Reactance for Reverse direction	13,500 Ohm	A

3.12 Grupo 68 Power Swing detection

Grupo 68 Power Swing detection

Nº	Parámetro	Valor	Grupo
2002	Power Swing Operating mode	all zones blocked	A
2006	68T Power swing trip	NO	A
2007	68 Trip delay after Power Swing Blocking	0,08 sec	A

3.13 Grupo 85-21 Pilot Prot. for Distance prot.

Grupo 85-21 Pilot Prot. for Distance prot.

Nº	Parámetro	Valor	Grupo
2101	85-21 Pilot Prot. for Distance prot.	ON	A
2102	Type of Line	Three Terminals	A
2103A	Time for send signal prolongation	0,10 sec	A
2109A	Transient Block.: Duration external flt.	0,03 sec	A
2110A	Transient Block.: Blk.T. after ext. flt.	0,17 sec	A

3.14 Grupo 50HS Instantaneous SOTF

Grupo 50HS Instantaneous SOTF

Nº	Parámetro	Valor	Grupo
2401	50HS Instantaneous SOTF-O/C is	ON	A

Grupo 50HS Instantaneous SOTF(2)

Nº	Parámetro	Valor	Grupo
2404	50HS SOTF-O/C PICKUP	6,67 A	A

3.15 Grupo Weak Infeed (Trip and/or Echo)

Grupo Weak Infeed (Trip and/or Echo)

Nº	Parámetro	Valor	Grupo
2501	Weak Infeed option	Echo only	A
2502A	Trip / Echo Delay after carrier receipt	0,04 sec	A
2503A	Trip Extension / Echo Impulse time	0,10 sec	A
2504A	Echo Block Time	0,50 sec	A
2505	Undervoltage (ph-g)	25 V	A
2509	Echo logic: 21 and 67N on common channel	NO	todo

3.16 Grupo 50(N)/51(N) Backup OverCurrent; Grupo General

Grupo 50(N)/51(N) Backup OverCurrent; Grupo General

Nº	Parámetro	Valor	Grupo
2601	Operating mode	ON:only active with Loss of VT sec. cir.	A
2680	Trip time delay after SOTF	0,00 sec	A

3.17 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B1

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B1

Nº	Parámetro	Valor	Grupo
2610	50-B1 Pickup	oo A	A
2611	50-B1 Delay	oo sec	A
2612	50N-B1 Pickup	oo A	A
2613	50N-B1 Delay	oo sec	A
2614	Instantaneous trip via BI	NO	A
2615	Instantaneous trip after SwitchOnToFault	NO	A

3.18 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B2

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B2

Nº	Parámetro	Valor	Grupo
2620	50-B2 Pickup	oo A	A
2621	50-B2 Delay	oo sec	A
2622	50N-B2 Pickup	oo A	A
2623	50N-B2 Delay	oo sec	A
2624	Instantaneous trip via Pilot Prot./BI	NO	A
2625	Instantaneous trip after SwitchOnToFault	NO	A

3.19 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 51(N)-B

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 51(N)-B

Nº	Parámetro	Valor	Grupo
2640	51-B Pickup	6,00 A	A
2642	51-B Time Dial	0,15 sec	A
2646	51-B Additional Time Delay	0,00 sec	A
2650	51N-B Pickup	0,25 A	A
2652	51N-B Time Dial	0,40 sec	A
2656	51N-B Additional Time Delay	0,00 sec	A
2660	IEC Curve	Normal Inverse	A
2670	Instantaneous trip via Pilot Prot./BI	NO	A
2671	Instantaneous trip after SwitchOnToFault	NO	A

3.20 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-STUB

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-STUB

Nº	Parámetro	Valor	Grupo
2630	50-STUB Pickup	0,50 A	A
2631	50-STUB Delay	oo sec	A
2632	50N-STUB Pickup	0,50 A	A
2633	50N-STUB Delay	oo sec	A
2634	Instantaneous trip via Pilot Prot./BI	NO	A
2635	Instantaneous trip after SwitchOnToFault	NO	A

3.21 Grupo Measurement Supervision; Grupo Balance / Summ.

Grupo Measurement Supervision; Grupo Balance / Summ.

Nº	Parámetro	Valor	Grupo
2901	Measurement Supervision	ON	A
2902A	Voltage Threshold for Balance Monitoring	50 V	A
2903A	Balance Factor for Voltage Monitor	0,75	A
2904A	Current Threshold for Balance Monitoring	0,50 A	A
2905A	Balance Factor for Current Monitor	0,50	A
2906A	Summated Current Monitoring Threshold	0,50 A	A
2907A	Summated Current Monitoring Factor	0,10	A
2908A	T Balance Factor for Voltage Monitor	5 sec	A
2909A	T Current Balance Monitor	5 sec	A

3.22 Grupo Measurement Supervision; Grupo Meas.Volt.Fail

Grupo Measurement Supervision; Grupo Meas.Volt.Fail

Nº	Parámetro	Valor	Grupo
2910	Fuse Failure Monitor	ON	A
2911A	Minimum Voltage Threshold V>	30 V	A
2912A	Maximum Current Threshold I<	0,50 A	A
2913A	Maximum Voltage Threshold V< (3phase)	5 V	A
2914A	Differential Current Threshold (3phase)	0,50 A	A
2915	Voltage Failure Supervision	with current superv. and CBpos(52a)	A
2916A	Delay Voltage Failure Supervision	3,00 sec	A

3.23 Grupo Measurement Supervision; Grupo VT mcb

Grupo Measurement Supervision; Grupo VT mcb

Nº	Parámetro	Valor	Grupo
2921	VT mcb operating time	5 ms	A

3.24 Grupo 50N/51N Ground OverCurrent; Grupo General

Grupo 50N/51N Ground OverCurrent; Grupo General

Nº	Parámetro	Valor	Grupo
3101	50N/51N Ground Overcurrent	ON	A
3102	Block 50N/51N for Distance protection	NO	A
3174	Block 50N/51N for Pickup 21	in each zone	A
3104A	Stabilisation Slope with Iphase	10 %	A
3170	2nd harmonic ratio for inrush restraint	20 %	A
3171	Max.Current, overriding inrush restraint	37,50 A	A
3172	Instantaneous mode after SwitchOnToFault	with Pickup and direction	A
3173	Trip time delay after SOTF	0,00 sec	A

3.25 Grupo 50N/51N Ground OverCurrent; Grupo 50N-1

Grupo 50N/51N Ground OverCurrent; Grupo 50N-1

Nº	Parámetro	Valor	Grupo
3110	Operating mode	Inactive	A
3111	Pickup	9,50 A	A
3112	Time Delay	0,30 sec	A
3113	Instantaneous trip via Pilot Prot./BI	NO	A
3114	Instantaneous trip after SwitchOnToFault	NO	A
3115	Inrush Blocking	NO	A

3.26 Grupo 50N/51N Ground OverCurrent; Grupo 50N-2

Grupo 50N/51N Ground OverCurrent; Grupo 50N-2

Nº	Parámetro	Valor	Grupo
3120	Operating mode	Inactive	A
3121	Pickup	0,83 A	A
3122	Time Delay	0,60 sec	A
3123	Instantaneous trip via Pilot Prot./BI	NO	A
3124	Instantaneous trip after SwitchOnToFault	NO	A
3125	Inrush Blocking	NO	A

3.27 Grupo 50N/51N Ground OverCurrent; Grupo 50N-3

Grupo 50N/51N Ground OverCurrent; Grupo 50N-3

Nº	Parámetro	Valor	Grupo
3130	Operating mode	Inactive	A
3131	Pickup	0,83 A	A
3132	Time Delay	0,90 sec	A
3133	Instantaneous trip via Pilot Prot./BI	NO	A
3134	Instantaneous trip after SwitchOnToFault	NO	A
3135	Inrush Blocking	NO	A

3.28 Grupo 50N/51N Ground OverCurrent; Grupo 51N InverseTime

Grupo 50N/51N Ground OverCurrent; Grupo 51N InverseTime

Nº	Parámetro	Valor	Grupo
3140	Operating mode	Forward	A
3141	Pickup	0,25 A	A
3143	Time Dial	0,40 sec	A
3147	Additional Time Delay	0,00 sec	A
3148	Instantaneous trip via Pilot Prot./BI	NO	A
3149	Instantaneous trip after SwitchOnToFault	NO	A
3150	Inrush Blocking	NO	A
3151	IEC Curve	Normal Inverse	A

3.29 Grupo 50N/51N Ground OverCurrent; Grupo Direction

Grupo 50N/51N Ground OverCurrent; Grupo Direction

Nº	Parámetro	Valor	Grupo
3160	Polarization	with Vo + Ig or V2	A
3162A	ALPHA, lower angle for forward direction	338 °	A
3163A	BETA, upper angle for forward direction	122 °	A
3164	Min. zero seq.voltage 3Vo for polarizing	3,0 V	A
3166	Min. neg. seq. polarizing voltage 3V2	3,0 V	A
3167	Min. neg. seq. polarizing current 3I2	0,25 A	A
3168	Compensation angle PHI comp. for Sr	255 °	A
3169	Forward direction power threshold	1,5 VA	A

3.30 Grupo Fault Locator

Grupo Fault Locator

Nº	Parámetro	Valor	Grupo
3802	Start fault locator with	TRIP	A
3806	Load Compensation	NO	A

3.31 Grupo 50BF Breaker Failure; Grupo 50BF

Grupo 50BF Breaker Failure; Grupo 50BF

Nº	Parámetro	Valor	Grupo
3901	50BF Breaker Failure Protection	ON	A
3902	50BF Pickup current threshold	2,08 A	A
3904	Delay after 1pole start for local trip	0,01 sec	A
3905	Delay after 3pole start for local trip	0,01 sec	A
3906	Delay of 2nd element for busbar trip	0,20 sec	A
3907	Delay for start with defective bkr.	0,00 sec	A
3908	Trip output selection with defective bkr	NO	A
3909	Check Breaker contacts	YES	A

3.32 Grupo 50BF Breaker Failure; Grupo End fault prot.

Grupo 50BF Breaker Failure; Grupo End fault prot.

Nº	Parámetro	Valor	Grupo
3921	End fault element	OFF	A
3922	Trip delay of end fault element	2,00 sec	A

3.33 Grupo 50BF Breaker Failure; Grupo PoleDiscrepancy

Grupo 50BF Breaker Failure; Grupo PoleDiscrepancy

Nº	Parámetro	Valor	Grupo
3931	Pole Discrepancy supervision	OFF	A

Grupo 50BF Breaker Failure; Grupo PoleDiscrepancy(2)

Nº	Parámetro	Valor	Grupo
3932	Trip delay with pole discrepancy	2,00 sec	A

3.34 Grupo Power System Data 2; Grupo Power System

Grupo Power System Data 2; Grupo Power System

Nº	Parámetro	Valor	Grupo
1103	Measurement: Full Scale Voltage (100%)	161,0 kV	B
1104	Measurement: Full Scale Current (100%)	600 A	B
1105	Line Angle	79 °	B
1211	Angle of inclination, distance charact.	79 °	B
1107	P,Q operational measured values sign	not reversed	B
1110	x' - Line Reactance per length unit	0,0362 Ohm / km	B
1111	Line Length	60,6 km	B
1120	Zero seq. comp. factor K0 for zone Z1	0,800	B
1121	Zero seq. comp. angle for zone Z1	3,02 °	B
1122	Zero seq.comp.factor K0,higher zones >Z1	0,800	B
1123	Zero seq. comp. angle, higher zones >Z1	3,02 °	B

3.35 Grupo Power System Data 2; Grupo Line Status

Grupo Power System Data 2; Grupo Line Status

Nº	Parámetro	Valor	Grupo
1130A	Pole Open Current Threshold	0,25 A	B
1131A	Pole Open Voltage Threshold	11 V	B
1132A	Seal-in Time after ALL closures	0,20 sec	B
1134	Recognition of Line Closures with	CBpos(52a) OR Current or Manual close BI	B
1135	RESET of Trip Command	with Pole Open Current Threshold only	B
1140A	CT Saturation Threshold	oo A	B
1150A	Seal-in Time after MANUAL closures	0,20 sec	B
1151	Manual CLOSE COMMAND generation	NO	B
1152	MANUAL Closure Impulse after CONTROL	<none>	todo

3.36 Grupo 21 Distance protection, general settings; Grupo General

Grupo 21 Distance protection, general settings; Grupo General

Nº	Parámetro	Valor	Grupo
1201	21 Distance protection is	ON	B
1202	Phase Current threshold for dist. meas.	0,50 A	B
1211	Angle of inclination, distance charact.	79 °	B
1208	Series compensated line	NO	B
1232	Instantaneous trip after SwitchOnToFault	with Zone Z1B	B
1241	R load, minimum Load Impedance (ph-g)	oo Ohm	B
1242	PHI load, maximum Load Angle (ph-g)	30 °	B
1243	R load, minimum Load Impedance (ph-ph)	oo Ohm	B
1244	PHI load, maximum Load Angle (ph-ph)	30 °	B
1357	Z1B enabled before 1st AR (int. or ext.)	YES	B

3.37 Grupo 21 Distance protection, general settings; Grupo Ground faults

Grupo 21 Distance protection, general settings; Grupo Ground faults

Nº	Parámetro	Valor	Grupo
1203	3I0 threshold for neutral current pickup	0,50 A	B
1204	3V0 threshold zero seq. voltage pickup	oo V	B
1207A	3I0>-pickup-stabilisation (3I0>/ Iphmax)	0,10	B
1209A	Criterion of ground fault recognition	3I0> OR 3V0>	B
1221A	Loop selection with 2Ph-G faults	all loops	B

3.38 Grupo 21 Distance protection, general settings; Grupo Time Delays

Grupo 21 Distance protection, general settings; Grupo Time Delays

Nº	Parámetro	Valor	Grupo
1210	21 Condition for zone timer start	with distance pickup	B
1305	T1-1phase, delay for single phase faults	0,00 sec	B
1306	T1multi-ph, delay for multi phase faults	0,00 sec	B
1315	T2-1phase, delay for single phase faults	0,40 sec	B
1316	T2multi-ph, delay for multi phase faults	0,40 sec	B
1325	T3 delay	2,00 sec	B
1335	T4 delay	2,00 sec	B
1345	T5 delay	oo sec	B
1355	T1B-1phase, delay for single ph. faults	0,00 sec	B
1356	T1B-multi-ph, delay for multi ph. faults	0,00 sec	B

3.39 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1

Nº	Parámetro	Valor	Grupo
1301	Operating mode Z1	Forward	B
1302	R(Z1), Resistance for ph-ph-faults	1,720 Ohm	B
1303	X(Z1), Reactance	1,720 Ohm	B
1304	RG(Z1), Resistance for ph-gnd faults	3,440 Ohm	B
1305	T1-1phase, delay for single phase faults	0,00 sec	B
1306	T1multi-ph, delay for multi phase faults	0,00 sec	B
1307	Zone Reduction Angle (load compensation)	0 °	B

3.40 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1B-exten.

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1B-exten.

Nº	Parámetro	Valor	Grupo
1351	Operating mode Z1B (overrreach zone)	Forward	B
1352	R(Z1B), Resistance for ph-ph-faults	4,000 Ohm	B
1353	X(Z1B), Reactance	4,000 Ohm	B
1354	RG(Z1B), Resistance for ph-gnd faults	8,000 Ohm	B
1355	T1B-1phase, delay for single ph. faults	0,00 sec	B
1356	T1B-multi-ph, delay for multi ph. faults	0,00 sec	B
1357	Z1B enabled before 1st AR (int. or ext.)	YES	B

3.41 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z2

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z2

Nº	Parámetro	Valor	Grupo
1311	Operating mode Z2	Forward	B
1312	R(Z2), Resistance for ph-ph-faults	4,000 Ohm	B
1313	X(Z2), Reactance	4,000 Ohm	B
1314	RG(Z2), Resistance for ph-gnd faults	8,000 Ohm	B
1315	T2-1phase, delay for single phase faults	0,40 sec	B
1316	T2multi-ph, delay for multi phase faults	0,40 sec	B

3.42 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z3

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z3

Nº	Parámetro	Valor	Grupo
1321	Operating mode Z3	Reverse	B
1322	R(Z3), Resistance for ph-ph-faults	2,000 Ohm	B
1323	X(Z3), Reactance	2,000 Ohm	B
1324	RG(Z3), Resistance for ph-gnd faults	4,000 Ohm	B
1325	T3 delay	2,00 sec	B

3.43 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z4

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z4

Nº	Parámetro	Valor	Grupo
1331	Operating mode Z4	Forward	B
1332	R(Z4), Resistance for ph-ph-faults	8,900 Ohm	B
1333	X(Z4), Reactance	8,900 Ohm	B
1334	RG(Z4), Resistance for ph-gnd faults	17,800 Ohm	B
1335	T4 delay	2,00 sec	B

3.44 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z5

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z5

Nº	Parámetro	Valor	Grupo
1341	Operating mode Z5	Non-Directional	B
1342	R(Z5), Resistance for ph-ph-faults	9,100 Ohm	B
1343	X(Z5)+, Reactance for Forward direction	9,100 Ohm	B
1344	RG(Z5), Resistance for ph-gnd faults	18,000 Ohm	B
1345	T5 delay	oo sec	B
1346	X(Z5)-, Reactance for Reverse direction	6,500 Ohm	B

3.45 Grupo 68 Power Swing detection

Grupo 68 Power Swing detection

Nº	Parámetro	Valor	Grupo
2002	Power Swing Operating mode	all zones blocked	B
2006	68T Power swing trip	NO	B
2007	68 Trip delay after Power Swing Blocking	0,08 sec	B

3.46 Grupo 85-21 Pilot Prot. for Distance prot.

Grupo 85-21 Pilot Prot. for Distance prot.

Nº	Parámetro	Valor	Grupo
2101	85-21 Pilot Prot. for Distance prot.	ON	B
2102	Type of Line	Two Terminals	B
2103A	Time for send signal prolongation	0,15 sec	B
2109A	Transient Block.: Duration external flt.	0,04 sec	B
2110A	Transient Block.: Blk.T. after ext. flt.	0,20 sec	B

3.47 Grupo 50HS Instantaneous SOTF

Grupo 50HS Instantaneous SOTF

Nº	Parámetro	Valor	Grupo
2401	50HS Instantaneous SOTF-O/C is	ON	B

Grupo 50HS Instantaneous SOTF(2)

Nº	Parámetro	Valor	Grupo
2404	50HS SOTF-O/C PICKUP	12,50 A	B

3.48 Grupo Weak Infeed (Trip and/or Echo)

Grupo Weak Infeed (Trip and/or Echo)

Nº	Parámetro	Valor	Grupo
2501	Weak Infeed option	Echo only	B
2502A	Trip / Echo Delay after carrier receipt	0,04 sec	B
2503A	Trip Extension / Echo Impulse time	0,15 sec	B
2504A	Echo Block Time	0,50 sec	B
2505	Undervoltage (ph-g)	25 V	B
2509	Echo logic: 21 and 67N on common channel	NO	todo

3.49 Grupo 50(N)/51(N) Backup OverCurrent; Grupo General

Grupo 50(N)/51(N) Backup OverCurrent; Grupo General

Nº	Parámetro	Valor	Grupo
2601	Operating mode	ON:only active with Loss of VT sec. cir.	B
2680	Trip time delay after SOTF	0,00 sec	B

3.50 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B1

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B1

Nº	Parámetro	Valor	Grupo
2610	50-B1 Pickup	9,00 A	B
2611	50-B1 Delay	0,01 sec	B
2612	50N-B1 Pickup	10,00 A	B
2613	50N-B1 Delay	0,02 sec	B
2614	Instantaneous trip via BI	NO	B
2615	Instantaneous trip after SwitchOnToFault	NO	B

3.51 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B2

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B2

Nº	Parámetro	Valor	Grupo
2620	50-B2 Pickup	oo A	B
2621	50-B2 Delay	oo sec	B
2622	50N-B2 Pickup	oo A	B
2623	50N-B2 Delay	oo sec	B
2624	Instantaneous trip via Pilot Prot./BI	NO	B
2625	Instantaneous trip after SwitchOnToFault	NO	B

3.52 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 51(N)-B

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 51(N)-B

Nº	Parámetro	Valor	Grupo
2640	51-B Pickup	3,46 A	B
2642	51-B Time Dial	0,15 sec	B
2646	51-B Additional Time Delay	0,00 sec	B
2650	51N-B Pickup	0,30 A	B
2652	51N-B Time Dial	0,74 sec	B
2656	51N-B Additional Time Delay	0,00 sec	B
2660	IEC Curve	Normal Inverse	B
2670	Instantaneous trip via Pilot Prot./BI	NO	B
2671	Instantaneous trip after SwitchOnToFault	NO	B

3.53 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-STUB

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-STUB

Nº	Parámetro	Valor	Grupo
2630	50-STUB Pickup	oo A	B
2631	50-STUB Delay	oo sec	B
2632	50N-STUB Pickup	oo A	B
2633	50N-STUB Delay	oo sec	B
2634	Instantaneous trip via Pilot Prot./BI	NO	B
2635	Instantaneous trip after SwitchOnToFault	NO	B

3.54 Grupo Measurement Supervision; Grupo Balance / Summ.

Grupo Measurement Supervision; Grupo Balance / Summ.

Nº	Parámetro	Valor	Grupo
2901	Measurement Supervision	ON	B
2902A	Voltage Threshold for Balance Monitoring	50 V	B
2903A	Balance Factor for Voltage Monitor	0,75	B
2904A	Current Threshold for Balance Monitoring	0,50 A	B
2905A	Balance Factor for Current Monitor	0,50	B
2906A	Summated Current Monitoring Threshold	0,50 A	B
2907A	Summated Current Monitoring Factor	0,10	B
2908A	T Balance Factor for Voltage Monitor	5 sec	B
2909A	T Current Balance Monitor	5 sec	B

3.55 Grupo Measurement Supervision; Grupo Meas.Volt.Fail

Grupo Measurement Supervision; Grupo Meas.Volt.Fail

Nº	Parámetro	Valor	Grupo
2910	Fuse Failure Monitor	ON	B
2911A	Minimum Voltage Threshold V>	30 V	B
2912A	Maximum Current Threshold I<	0,50 A	B
2913A	Maximum Voltage Threshold V< (3phase)	5 V	B
2914A	Differential Current Threshold (3phase)	0,50 A	B
2915	Voltage Failure Supervision	with current superv. and CBpos(52a)	B
2916A	Delay Voltage Failure Supervision	3,00 sec	B

3.56 Grupo Measurement Supervision; Grupo VT mcb

Grupo Measurement Supervision; Grupo VT mcb

Nº	Parámetro	Valor	Grupo
2921	VT mcb operating time	5 ms	B

3.57 Grupo 50N/51N Ground OverCurrent; Grupo General

Grupo 50N/51N Ground OverCurrent; Grupo General

Nº	Parámetro	Valor	Grupo
3101	50N/51N Ground Overcurrent	ON	B
3102	Block 50N/51N for Distance protection	NO	B
3174	Block 50N/51N for Pickup 21	in each zone	B
3104A	Stabilisation Slope with Iphase	10 %	B
3170	2nd harmonic ratio for inrush restraint	15 %	B
3171	Max.Current, overriding inrush restraint	37,50 A	B
3172	Instantaneous mode after SwitchOnToFault	with Pickup and direction	B
3173	Trip time delay after SOTF	0,00 sec	B

3.58 Grupo 50N/51N Ground OverCurrent; Grupo 50N-1

Grupo 50N/51N Ground OverCurrent; Grupo 50N-1

Nº	Parámetro	Valor	Grupo
3110	Operating mode	Forward	B
3111	Pickup	10,00 A	B
3112	Time Delay	0,03 sec	B
3113	Instantaneous trip via Pilot Prot./BI	NO	B
3114	Instantaneous trip after SwitchOnToFault	NO	B
3115	Inrush Blocking	NO	B

3.59 Grupo 50N/51N Ground OverCurrent; Grupo 50N-2

Grupo 50N/51N Ground OverCurrent; Grupo 50N-2

Nº	Parámetro	Valor	Grupo
3120	Operating mode	Inactive	B
3121	Pickup	10,00 A	B
3122	Time Delay	0,60 sec	B
3123	Instantaneous trip via Pilot Prot./BI	NO	B
3124	Instantaneous trip after SwitchOnToFault	NO	B
3125	Inrush Blocking	NO	B

3.60 Grupo 50N/51N Ground OverCurrent; Grupo 50N-3

Grupo 50N/51N Ground OverCurrent; Grupo 50N-3

Nº	Parámetro	Valor	Grupo
3130	Operating mode	Inactive	B
3131	Pickup	5,00 A	B
3132	Time Delay	0,90 sec	B
3133	Instantaneous trip via Pilot Prot./BI	NO	B
3134	Instantaneous trip after SwitchOnToFault	NO	B
3135	Inrush Blocking	NO	B

3.61 Grupo 50N/51N Ground OverCurrent; Grupo 51N InverseTime

Grupo 50N/51N Ground OverCurrent; Grupo 51N InverseTime

Nº	Parámetro	Valor	Grupo
3140	Operating mode	Forward	B
3141	Pickup	0,30 A	B
3143	Time Dial	0,75 sec	B
3147	Additional Time Delay	0,00 sec	B
3148	Instantaneous trip via Pilot Prot./BI	NO	B
3149	Instantaneous trip after SwitchOnToFault	NO	B
3150	Inrush Blocking	NO	B
3151	IEC Curve	Normal Inverse	B

3.62 Grupo 50N/51N Ground OverCurrent; Grupo Direction

Grupo 50N/51N Ground OverCurrent; Grupo Direction

Nº	Parámetro	Valor	Grupo
3160	Polarization	with Vo + Ig or V2	B
3162A	ALPHA, lower angle for forward direction	338 °	B
3163A	BETA, upper angle for forward direction	122 °	B
3164	Min. zero seq.voltage 3Vo for polarizing	3,0 V	B
3166	Min. neg. seq. polarizing voltage 3V2	3,0 V	B
3167	Min. neg. seq. polarizing current 3I2	0,25 A	B
3168	Compensation angle PHI comp. for Sr	255 °	B
3169	Forward direction power threshold	1,5 VA	B

3.63 Grupo Fault Locator

Grupo Fault Locator

Nº	Parámetro	Valor	Grupo
3802	Start fault locator with	Pickup	B
3806	Load Compensation	NO	B

3.64 Grupo 50BF Breaker Failure; Grupo 50BF

Grupo 50BF Breaker Failure; Grupo 50BF

Nº	Parámetro	Valor	Grupo
3901	50BF Breaker Failure Protection	ON	B
3902	50BF Pickup current threshold	6,00 A	B
3904	Delay after 1pole start for local trip	0,02 sec	B
3905	Delay after 3pole start for local trip	0,02 sec	B
3906	Delay of 2nd element for busbar trip	2,00 sec	B
3907	Delay for start with defective bkr.	0,00 sec	B
3908	Trip output selection with defective bkr	NO	B
3909	Check Breaker contacts	YES	B

3.65 Grupo 50BF Breaker Failure; Grupo End fault prot.

Grupo 50BF Breaker Failure; Grupo End fault prot.

Nº	Parámetro	Valor	Grupo
3921	End fault element	OFF	B
3922	Trip delay of end fault element	2,00 sec	B

3.66 Grupo 50BF Breaker Failure; Grupo PoleDiscrepancy

Grupo 50BF Breaker Failure; Grupo PoleDiscrepancy

Nº	Parámetro	Valor	Grupo
3931	Pole Discrepancy supervision	OFF	B

Grupo 50BF Breaker Failure; Grupo PoleDiscrepancy(2)

Nº	Parámetro	Valor	Grupo
3932	Trip delay with pole discrepancy	2,00 sec	B

3.67 Grupo Power System Data 2; Grupo Power System

Grupo Power System Data 2; Grupo Power System

Nº	Parámetro	Valor	Grupo
1103	Measurement: Full Scale Voltage (100%)	161,0 kV	C
1104	Measurement: Full Scale Current (100%)	600 A	C
1105	Line Angle	79 °	C
1211	Angle of inclination, distance charact.	79 °	C
1107	P,Q operational measured values sign	not reversed	C
1110	x' - Line Reactance per length unit	0,0362 Ohm / km	C
1111	Line Length	60,6 km	C
1120	Zero seq. comp. factor K0 for zone Z1	0,800	C
1121	Zero seq. comp. angle for zone Z1	3,02 °	C
1122	Zero seq.comp.factor K0,higher zones >Z1	0,800	C
1123	Zero seq. comp. angle, higher zones >Z1	3,02 °	C

3.68 Grupo Power System Data 2; Grupo Line Status

Grupo Power System Data 2; Grupo Line Status

Nº	Parámetro	Valor	Grupo
1130A	Pole Open Current Threshold	0,25 A	C
1131A	Pole Open Voltage Threshold	11 V	C
1132A	Seal-in Time after ALL closures	0,20 sec	C
1134	Recognition of Line Closures with	CBpos(52a) OR Current or Manual close BI	C
1135	RESET of Trip Command	with Pole Open Current Threshold only	C
1140A	CT Saturation Threshold	oo A	C
1150A	Seal-in Time after MANUAL closures	0,20 sec	C
1151	Manual CLOSE COMMAND generation	NO	C
1152	MANUAL Closure Impulse after CONTROL	<none>	todo

3.69 Grupo 21 Distance protection, general settings; Grupo General

Grupo 21 Distance protection, general settings; Grupo General

Nº	Parámetro	Valor	Grupo
1201	21 Distance protection is	ON	C
1202	Phase Current threshold for dist. meas.	0,50 A	C
1211	Angle of inclination, distance charact.	79 °	C
1208	Series compensated line	NO	C
1232	Instantaneous trip after SwitchOnToFault	with Zone Z1B	C
1241	R load, minimum Load Impedance (ph-g)	oo Ohm	C
1242	PHI load, maximum Load Angle (ph-g)	30 °	C
1243	R load, minimum Load Impedance (ph-ph)	oo Ohm	C
1244	PHI load, maximum Load Angle (ph-ph)	30 °	C
1357	Z1B enabled before 1st AR (int. or ext.)	YES	C

3.70 Grupo 21 Distance protection, general settings; Grupo Ground faults

Grupo 21 Distance protection, general settings; Grupo Ground faults

Nº	Parámetro	Valor	Grupo
1203	3I0 threshold for neutral current pickup	0,50 A	C
1204	3V0 threshold zero seq. voltage pickup	oo V	C
1207A	3I0>-pickup-stabilisation (3I0>/ Iphmax)	0,10	C
1209A	Criterion of ground fault recognition	3I0> OR 3V0>	C
1221A	Loop selection with 2Ph-G faults	all loops	C

3.71 Grupo 21 Distance protection, general settings; Grupo Time Delays

Grupo 21 Distance protection, general settings; Grupo Time Delays

Nº	Parámetro	Valor	Grupo
1210	21 Condition for zone timer start	with distance pickup	C
1305	T1-1phase, delay for single phase faults	0,00 sec	C
1306	T1multi-ph, delay for multi phase faults	0,00 sec	C
1315	T2-1phase, delay for single phase faults	0,40 sec	C
1316	T2multi-ph, delay for multi phase faults	0,40 sec	C
1325	T3 delay	2,00 sec	C
1335	T4 delay	2,00 sec	C
1345	T5 delay	oo sec	C
1355	T1B-1phase, delay for single ph. faults	0,00 sec	C
1356	T1B-multi-ph, delay for multi ph. faults	0,00 sec	C

3.72 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1

Nº	Parámetro	Valor	Grupo
1301	Operating mode Z1	Forward	C
1302	R(Z1), Resistance for ph-ph-faults	1,720 Ohm	C
1303	X(Z1), Reactance	1,720 Ohm	C
1304	RG(Z1), Resistance for ph-gnd faults	3,440 Ohm	C
1305	T1-1phase, delay for single phase faults	0,00 sec	C
1306	T1multi-ph, delay for multi phase faults	0,00 sec	C
1307	Zone Reduction Angle (load compensation)	0 °	C

3.73 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1B-exten.

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1B-exten.

Nº	Parámetro	Valor	Grupo
1351	Operating mode Z1B (overrreach zone)	Forward	C
1352	R(Z1B), Resistance for ph-ph-faults	4,000 Ohm	C
1353	X(Z1B), Reactance	4,000 Ohm	C
1354	RG(Z1B), Resistance for ph-gnd faults	8,000 Ohm	C
1355	T1B-1phase, delay for single ph. faults	0,00 sec	C
1356	T1B-multi-ph, delay for multi ph. faults	0,00 sec	C
1357	Z1B enabled before 1st AR (int. or ext.)	YES	C

3.74 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z2

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z2

Nº	Parámetro	Valor	Grupo
1311	Operating mode Z2	Forward	C
1312	R(Z2), Resistance for ph-ph-faults	4,000 Ohm	C
1313	X(Z2), Reactance	4,000 Ohm	C
1314	RG(Z2), Resistance for ph-gnd faults	8,000 Ohm	C
1315	T2-1phase, delay for single phase faults	0,40 sec	C
1316	T2multi-ph, delay for multi phase faults	0,40 sec	C

3.75 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z3

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z3

Nº	Parámetro	Valor	Grupo
1321	Operating mode Z3	Reverse	C
1322	R(Z3), Resistance for ph-ph-faults	5,000 Ohm	C
1323	X(Z3), Reactance	5,000 Ohm	C
1324	RG(Z3), Resistance for ph-gnd faults	5,000 Ohm	C
1325	T3 delay	2,00 sec	C

3.76 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z4

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z4

Nº	Parámetro	Valor	Grupo
1331	Operating mode Z4	Forward	C
1332	R(Z4), Resistance for ph-ph-faults	8,900 Ohm	C
1333	X(Z4), Reactance	8,900 Ohm	C
1334	RG(Z4), Resistance for ph-gnd faults	17,800 Ohm	C
1335	T4 delay	2,00 sec	C

3.77 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z5

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z5

Nº	Parámetro	Valor	Grupo
1341	Operating mode Z5	Non-Directional	C
1342	R(Z5), Resistance for ph-ph-faults	9,100 Ohm	C
1343	X(Z5)+, Reactance for Forward direction	9,100 Ohm	C
1344	RG(Z5), Resistance for ph-gnd faults	18,000 Ohm	C
1345	T5 delay	oo sec	C
1346	X(Z5)-, Reactance for Reverse direction	6,500 Ohm	C

3.78 Grupo 68 Power Swing detection

Grupo 68 Power Swing detection

Nº	Parámetro	Valor	Grupo
2002	Power Swing Operating mode	all zones blocked	C
2006	68T Power swing trip	NO	C
2007	68 Trip delay after Power Swing Blocking	0,08 sec	C

3.79 Grupo 85-21 Pilot Prot. for Distance prot.

Grupo 85-21 Pilot Prot. for Distance prot.

Nº	Parámetro	Valor	Grupo
2101	85-21 Pilot Prot. for Distance prot.	ON	C
2102	Type of Line	Two Terminals	C
2103A	Time for send signal prolongation	0,15 sec	C
2109A	Transient Block.: Duration external flt.	0,04 sec	C
2110A	Transient Block.: Blk.T. after ext. flt.	0,20 sec	C

3.80 Grupo 50HS Instantaneous SOTF

Grupo 50HS Instantaneous SOTF

Nº	Parámetro	Valor	Grupo
2401	50HS Instantaneous SOTF-O/C is	ON	C

Grupo 50HS Instantaneous SOTF(2)

Nº	Parámetro	Valor	Grupo
2404	50HS SOTF-O/C PICKUP	12,50 A	C

3.81 Grupo Weak Infeed (Trip and/or Echo)

Grupo Weak Infeed (Trip and/or Echo)

Nº	Parámetro	Valor	Grupo
2501	Weak Infeed option	Echo only	C
2502A	Trip / Echo Delay after carrier receipt	0,04 sec	C
2503A	Trip Extension / Echo Impulse time	0,15 sec	C
2504A	Echo Block Time	0,50 sec	C
2505	Undervoltage (ph-g)	25 V	C
2509	Echo logic: 21 and 67N on common channel	NO	todo

3.82 Grupo 50(N)/51(N) Backup OverCurrent; Grupo General

Grupo 50(N)/51(N) Backup OverCurrent; Grupo General

Nº	Parámetro	Valor	Grupo
2601	Operating mode	ON:only active with Loss of VT sec. cir.	C
2680	Trip time delay after SOTF	0,00 sec	C

3.83 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B1

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B1

Nº	Parámetro	Valor	Grupo
2610	50-B1 Pickup	9,00 A	C
2611	50-B1 Delay	0,01 sec	C
2612	50N-B1 Pickup	10,00 A	C
2613	50N-B1 Delay	0,02 sec	C
2614	Instantaneous trip via BI	NO	C
2615	Instantaneous trip after SwitchOnToFault	NO	C

3.84 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B2

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B2

Nº	Parámetro	Valor	Grupo
2620	50-B2 Pickup	oo A	C
2621	50-B2 Delay	oo sec	C
2622	50N-B2 Pickup	oo A	C
2623	50N-B2 Delay	oo sec	C
2624	Instantaneous trip via Pilot Prot./BI	NO	C
2625	Instantaneous trip after SwitchOnToFault	NO	C

3.85 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 51(N)-B

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 51(N)-B

Nº	Parámetro	Valor	Grupo
2640	51-B Pickup	3,46 A	C
2642	51-B Time Dial	0,15 sec	C
2646	51-B Additional Time Delay	0,00 sec	C
2650	51N-B Pickup	0,30 A	C
2652	51N-B Time Dial	0,74 sec	C
2656	51N-B Additional Time Delay	0,00 sec	C
2660	IEC Curve	Normal Inverse	C
2670	Instantaneous trip via Pilot Prot./BI	NO	C
2671	Instantaneous trip after SwitchOnToFault	NO	C

3.86 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-STUB

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-STUB

Nº	Parámetro	Valor	Grupo
2630	50-STUB Pickup	oo A	C
2631	50-STUB Delay	oo sec	C
2632	50N-STUB Pickup	oo A	C
2633	50N-STUB Delay	oo sec	C
2634	Instantaneous trip via Pilot Prot./BI	NO	C
2635	Instantaneous trip after SwitchOnToFault	NO	C

3.87 Grupo Measurement Supervision; Grupo Balance / Summ.

Grupo Measurement Supervision; Grupo Balance / Summ.

Nº	Parámetro	Valor	Grupo
2901	Measurement Supervision	ON	C
2902A	Voltage Threshold for Balance Monitoring	50 V	C
2903A	Balance Factor for Voltage Monitor	0,75	C
2904A	Current Threshold for Balance Monitoring	0,50 A	C
2905A	Balance Factor for Current Monitor	0,50	C
2906A	Summated Current Monitoring Threshold	0,50 A	C
2907A	Summated Current Monitoring Factor	0,10	C
2908A	T Balance Factor for Voltage Monitor	5 sec	C
2909A	T Current Balance Monitor	5 sec	C

3.88 Grupo Measurement Supervision; Grupo Meas.Volt.Fail

Grupo Measurement Supervision; Grupo Meas.Volt.Fail

Nº	Parámetro	Valor	Grupo
2910	Fuse Failure Monitor	ON	C
2911A	Minimum Voltage Threshold V>	30 V	C
2912A	Maximum Current Threshold I<	0,50 A	C
2913A	Maximum Voltage Threshold V< (3phase)	5 V	C
2914A	Differential Current Threshold (3phase)	0,50 A	C
2915	Voltage Failure Supervision	with current superv. and CBpos(52a)	C
2916A	Delay Voltage Failure Supervision	3,00 sec	C

3.89 Grupo Measurement Supervision; Grupo VT mcb

Grupo Measurement Supervision; Grupo VT mcb

Nº	Parámetro	Valor	Grupo
2921	VT mcb operating time	5 ms	C

3.90 Grupo 50N/51N Ground OverCurrent; Grupo General

Grupo 50N/51N Ground OverCurrent; Grupo General

Nº	Parámetro	Valor	Grupo
3101	50N/51N Ground Overcurrent	ON	C
3102	Block 50N/51N for Distance protection	NO	C
3174	Block 50N/51N for Pickup 21	in each zone	C
3104A	Stabilisation Slope with Iphase	10 %	C
3170	2nd harmonic ratio for inrush restraint	15 %	C
3171	Max.Current, overriding inrush restraint	37,50 A	C
3172	Instantaneous mode after SwitchOnToFault	with Pickup and direction	C
3173	Trip time delay after SOTF	0,00 sec	C

3.91 Grupo 50N/51N Ground OverCurrent; Grupo 50N-1

Grupo 50N/51N Ground OverCurrent; Grupo 50N-1

Nº	Parámetro	Valor	Grupo
3110	Operating mode	Forward	C
3111	Pickup	10,00 A	C
3112	Time Delay	0,03 sec	C
3113	Instantaneous trip via Pilot Prot./BI	NO	C
3114	Instantaneous trip after SwitchOnToFault	NO	C
3115	Inrush Blocking	NO	C

3.92 Grupo 50N/51N Ground OverCurrent; Grupo 50N-2

Grupo 50N/51N Ground OverCurrent; Grupo 50N-2

Nº	Parámetro	Valor	Grupo
3120	Operating mode	Inactive	C
3121	Pickup	10,00 A	C
3122	Time Delay	0,60 sec	C
3123	Instantaneous trip via Pilot Prot./BI	NO	C
3124	Instantaneous trip after SwitchOnToFault	NO	C
3125	Inrush Blocking	NO	C

3.93 Grupo 50N/51N Ground OverCurrent; Grupo 50N-3

Grupo 50N/51N Ground OverCurrent; Grupo 50N-3

Nº	Parámetro	Valor	Grupo
3130	Operating mode	Inactive	C
3131	Pickup	5,00 A	C
3132	Time Delay	0,90 sec	C
3133	Instantaneous trip via Pilot Prot./BI	NO	C
3134	Instantaneous trip after SwitchOnToFault	NO	C
3135	Inrush Blocking	NO	C

3.94 Grupo 50N/51N Ground OverCurrent; Grupo 51N InverseTime

Grupo 50N/51N Ground OverCurrent; Grupo 51N InverseTime

Nº	Parámetro	Valor	Grupo
3140	Operating mode	Forward	C
3141	Pickup	0,30 A	C
3143	Time Dial	0,75 sec	C
3147	Additional Time Delay	0,00 sec	C
3148	Instantaneous trip via Pilot Prot./BI	NO	C
3149	Instantaneous trip after SwitchOnToFault	NO	C
3150	Inrush Blocking	NO	C
3151	IEC Curve	Normal Inverse	C

3.95 Grupo 50N/51N Ground OverCurrent; Grupo Direction

Grupo 50N/51N Ground OverCurrent; Grupo Direction

Nº	Parámetro	Valor	Grupo
3160	Polarization	with Vo + Ig or V2	C
3162A	ALPHA, lower angle for forward direction	338 °	C
3163A	BETA, upper angle for forward direction	122 °	C
3164	Min. zero seq.voltage 3Vo for polarizing	3,0 V	C
3166	Min. neg. seq. polarizing voltage 3V2	3,0 V	C
3167	Min. neg. seq. polarizing current 3I2	0,25 A	C
3168	Compensation angle PHI comp. for Sr	255 °	C
3169	Forward direction power threshold	1,5 VA	C

3.96 Grupo Fault Locator

Grupo Fault Locator

Nº	Parámetro	Valor	Grupo
3802	Start fault locator with	Pickup	C
3806	Load Compensation	NO	C

3.97 Grupo 50BF Breaker Failure; Grupo 50BF

Grupo 50BF Breaker Failure; Grupo 50BF

Nº	Parámetro	Valor	Grupo
3901	50BF Breaker Failure Protection	ON	C
3902	50BF Pickup current threshold	6,00 A	C
3904	Delay after 1pole start for local trip	0,02 sec	C
3905	Delay after 3pole start for local trip	0,02 sec	C
3906	Delay of 2nd element for busbar trip	2,00 sec	C
3907	Delay for start with defective bkr.	0,00 sec	C
3908	Trip output selection with defective bkr	NO	C
3909	Check Breaker contacts	YES	C

3.98 Grupo 50BF Breaker Failure; Grupo End fault prot.

Grupo 50BF Breaker Failure; Grupo End fault prot.

Nº	Parámetro	Valor	Grupo
3921	End fault element	OFF	C
3922	Trip delay of end fault element	2,00 sec	C

3.99 Grupo 50BF Breaker Failure; Grupo PoleDiscrepancy

Grupo 50BF Breaker Failure; Grupo PoleDiscrepancy

Nº	Parámetro	Valor	Grupo
3931	Pole Discrepancy supervision	OFF	C

Grupo 50BF Breaker Failure; Grupo PoleDiscrepancy(2)

Nº	Parámetro	Valor	Grupo
3932	Trip delay with pole discrepancy	2,00 sec	C

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VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

PRODUCT SETUP

DISPLAY PROPERTIES

Flash Message Time	2.0 s
Default Message Timeout	15 s
Default Message Intensity (VFD Only)	25 %
Screen Saver Feature (LCD Only)	Enabled
Screen Saver Wait Time (LCD Only)	10 min
Current Cutoff Level	0.010 pu
Voltage Cutoff Level	1.0 V

COMMUNICATIONS

SERIAL PORTS

RS485 Com2 Baud Rate	19200
RS485 Com2 Parity	None
RS485 Com2 Response Min Time	0 ms

NETWORK

IP Address	10. 80.143.186
IP Subnet Mask	255.255.255. 0
Gateway IP Address	10. 80.143. 1
Ethernet Operation Mode	Full-Duplex

MODBUS PROTOCOL

Modbus Slave Address	254
Modbus TCP Port Number	502

DNP PROTOCOL

DNP Channel 1 Port	NETWORK
DNP Channel 2 Port	NONE
DNP Address	2
DNP Client Address 1	10. 80.143.200
DNP Client Address 2	10. 80.143.201
DNP Client Address 3	0. 0. 0. 0
DNP Client Address 4	0. 0. 0. 0
DNP Client Address 5	0. 0. 0. 0
DNP TCP/UDP Port Number	20000
DNP Unsol Resp Function	Disabled
DNP Unsol Resp Timeout	5 s
DNP Unsol Resp Max Retries	10
DNP Unsol Resp Dest Addr	10
DNP Current Scale Factor	1
DNP Voltage Scale Factor	1
DNP Power Scale Factor	1
DNP Energy Scale Factor	1
DNP Other Scale Factor	1
DNP Current Default Deadband	30000
DNP Voltage Default Deadband	30000
DNP Power Default Deadband	30000
DNP Energy Default Deadband	30000
DNP Other Default Deadband	30000
DNP Time Sync IIN Period	1440 min
DNP Message Fragment Size	240
DNP Object 1 Default Variation	2
DNP Object 2 Default Variation	2
DNP Object 20 Default Variation	1
DNP Object 21 Default Variation	1
DNP Object 22 Default Variation	1
DNP Object 23 Default Variation	1
DNP Object 30 Default Variation	1
DNP Object 32 Default Variation	1
DNP Number of Paired Controls	0

DNP - IEC104 POINTS LISTS

DNP Binary Input Point 0	LED NEUTRAL/GROUND
DNP Binary Input Point 1	LED PHASE A
DNP Binary Input Point 2	LED PHASE B
DNP Binary Input Point 3	LED PHASE C
DNP Binary Input Point 4	LED TRIP
DNP Binary Input Point 5	PH DIST Z1 OP
DNP Binary Input Point 6	PH DIST Z2 OP

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DESCRIPTION: (NONE)
TEXT COLOR

DNP - IEC104 POINTS LISTS (continued from last page)

DNP Binary Input Point 7	PH DIST Z3 OP
DNP Binary Input Point 8	PH DIST Z4 OP
DNP Binary Input Point 9	PH DIST Z5 OP
DNP Binary Input Point 10	LINE PICKUP OP
DNP Binary Input Point 11	SETTING GROUP ACT 1
DNP Binary Input Point 12	SETTING GROUP ACT 2
DNP Binary Input Point 13	PHASE TOC1 OP
DNP Binary Input Point 14	POWER SWING UN/BLOCK
DNP Binary Input Point 15	NEUTRAL TOC1 OP
DNP Binary Input Point 16	GND DIST Z1 OP
DNP Binary Input Point 17	GND DIST Z2 OP
DNP Binary Input Point 18	GND DIST Z3 OP
DNP Binary Input Point 19	GND DIST Z5 OP
DNP Binary Input Point 20	GND DIST Z4 OP
DNP Binary Input Point 21	AR 3-P/1 RIP
DNP Binary Input Point 22	AR CLOSE BKR 1
DNP Binary Input Point 23	AR BKR 1 BLK
DNP Binary Input Point 24	AR DISABLED
DNP Binary Input Point 25	AR ENABLED
DNP Analog Input Point 0	Fault Location [1]
DNP Analog Input Point 1	Fault Type [1]

HTTP

HTTP TCP Port Number	80

TFTP

TFTP Main UDP Port Number	69
TFTP Data UDP Port Number 1	0
TFTP Data UDP Port Number 2	0

REAL TIME CLOCK

IRIG-B Signal Type	DC Shift
Real Time Clock Events	Disabled

FAULT REPORT

Fault Report 1 Source	LINEA (SRC 1)
Fault Report 1 Trigger	pkp Z1o z2 On (VO4)
Fault Report 1 Positive Seq (Z1) Mag	2.19 ohms
Fault Report 1 Positive Seq (Z1) Angle	79 deg
Fault Report 1 Zero Seq (Z0) Mag	7.35 ohms
Fault Report 1 Zero Seq (Z0) Angle	81 deg
Fault Report 1 Line Length Units	km
Fault Report 1 Line Length	60.6

OSCILLOGRAPHY

Number Of Records	10
Trigger Mode	Automatic Overwrite
Trigger Position	20 %
Trigger Source	OSCILOGRAFIA On (VO3)
AC Input Waveforms	32 samples/cycle
Digital Channel 1	PH DIST Z1 OP
Digital Channel 2	PH DIST Z2 OP
Digital Channel 3	PH DIST Z3 OP
Digital Channel 4	PH DIST Z4 OP
Digital Channel 5	GND DIST Z1 OP
Digital Channel 6	GND DIST Z2 OP
Digital Channel 7	GND DIST Z3 OP
Digital Channel 8	GND DIST Z4 OP
Digital Channel 9	PHASE TOC1 OP
Digital Channel 10	PH DIR1 BLK
Digital Channel 11	NEUTRAL TOC1 OP
Digital Channel 12	NTRL DIR OC1 REV
Digital Channel 13	NTRL DIR OC2 FWD
Digital Channel 14	HYBRID POTT OP
Digital Channel 15	POWER SWING BLOCK
Digital Channel 16	PH DIST Z1 PKP
Digital Channel 17	PH DIST Z2 PKP
Digital Channel 18	PH DIST Z3 PKP
Digital Channel 19	PH DIST Z4 PKP

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DESCRIPTION: (NONE)
TEXT COLOR

OSCILLOGRAPHY (continued from last page)

Digital Channel 20	LINE PICKUP OP
Digital Channel 21	PHASE IOC1 OP
Digital Channel 22	AR 1-P RIP
Digital Channel 23	AR CLOSE BKR 1
Digital Channel 24	HYBRID POTT TX1
Digital Channel 25	AR LO
Digital Channel 26	CIERRE MANUA On(W3a)
Digital Channel 27	79 DESCO On(H7a)
Digital Channel 28	79 conectado On(H7c)
Digital Channel 29	63-FALLA PRE On(H8a)
Digital Channel 30	52A2 (a) On(H8c)
Digital Channel 31	ECHO 3P On (VO37)
Digital Channel 32	RECEP JAHUEL On(W1a)
Digital Channel 33	RECEP ITAHUE On(W1c)
Digital Channel 34	ITE AC FALLA On(W4a)
Digital Channel 35	AUTORI 79 On(W5a)
Digital Channel 36	GND DIST Z1 PKP
Digital Channel 37	GND DIST Z2 PKP
Digital Channel 38	GND DIST Z3 PKP
Digital Channel 39	GND DIST Z4 PKP
Digital Channel 40	PUTT TX1
Digital Channel 41	PUTT TX2
Digital Channel 42	BLQ Zonas PH On (VO1)
Digital Channel 43	TRIP GRAL On (VO2)
Digital Channel 44	pkp Z1o z2 On (VO4)
Digital Channel 45	BLOq reconec On (VO5)
Digital Channel 46	ORD. CIERRE On (VO6)
Digital Channel 47	Alarma f. re On (VO7)
Digital Channel 48	POWER SWING 50DD
Digital Channel 49	POWER SWING INNER
Digital Channel 50	POWER SWING OUTER
Digital Channel 51	POWER SWING UN/BLOCK
Digital Channel 52	AR BKR 1 BLK
Digital Channel 53	AR CLOSE BKR 1
Digital Channel 54	TX MMOO On (VO12)
Digital Channel 55	AR 3-P/1 RIP
Digital Channel 56	AR DISABLED
Digital Channel 57	LOAD ENCHR OP
Digital Channel 58	SRC1 50DD OP
Digital Channel 59	BKR FAIL 1 T1 OP
Digital Channel 60	NEUTRAL IOC1 OP
Digital Channel 61	NEUTRAL TOC1 PKP
Digital Channel 62	GND DIST Z5 OP
Digital Channel 63	PH DIST Z5 OP
Analog Channel 1	SRC1 I_0 Mag
Analog Channel 2	SRC1 V_0 Mag
Analog Channel 3	SRC1 I_0 Angle
Analog Channel 4	SRC1 V_0 Angle
Analog Channel 5	SRC1 P
Analog Channel 6	Fault Location [1]
Analog Channel 7	SRC1 Frequency
Analog Channel 8	SRC1 In Mag
Analog Channel 9	SRC1 In Angle
Analog Channel 10	Brk 1 Op Time
Analog Channel 11	Fault Type [1]
Analog Channel 12	Tracking Frequency
Analog Channel 13	SRC1 S

DATA LOGGER

Data Logger Mode	Continuous
Data Logger Trigger	OFF
Rate	60000 msec

USER-PROGRAMMABLE LEDS

TRIP AND ALARMS LEDS

Trip LED Input	TRIP 3-POLE

USER PROGRAMMABLE LEDS

LED 1: OPERAND	RECEP ACELER On (VO22)

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FILES
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VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

USER PROGRAMMABLE LEDS (continued from last page)

LED 1: TYPE	Latched
LED 2: OPERAND	LED Z1 On (VO13)
LED 2: TYPE	Latched
LED 3: OPERAND	LED Z2 On (VO14)
LED 3: TYPE	Latched
LED 4: OPERAND	LED Z3 On (VO15)
LED 4: TYPE	Latched
LED 5: OPERAND	LED Z4 On (VO16)
LED 5: TYPE	Latched
LED 6: OPERAND	79 off On (VO18)
LED 6: TYPE	Self-Reset
LED 7: OPERAND	79 on On (VO17)
LED 7: TYPE	Self-Reset
LED 8: OPERAND	LINE PICKUP OP
LED 8: TYPE	Latched
LED 9: OPERAND	52A2 (a) Off(H8c)
LED 9: TYPE	Self-Reset
LED 10: OPERAND	52A2 (a) On(H8c)
LED 10: TYPE	Self-Reset
LED 11: OPERAND	RECEP JAHUEL On(W1a)
LED 11: TYPE	Self-Reset
LED 12: OPERAND	67-67N On (VO27)
LED 12: TYPE	Latched
LED 13: OPERAND	51-51N On (VO28)
LED 13: TYPE	Latched
LED 14: OPERAND	50-50N On (VO29)
LED 14: TYPE	Latched
LED 15: OPERAND	AR 3-P/1 RIP
LED 15: TYPE	Self-Reset
LED 16: OPERAND	AR LO
LED 16: TYPE	Self-Reset
LED 17: OPERAND	POWER SWING UN/BLOCK
LED 17: TYPE	Latched
LED 18: OPERAND	SRC1 VT FUSE FAIL OP
LED 18: TYPE	Self-Reset
LED 19: OPERAND	BKR FAIL 1 T2 OP
LED 19: TYPE	Latched
LED 20: OPERAND	TX MMOO On (VO12)
LED 20: TYPE	Latched
LED 21: OPERAND	BLQ Zonas PH On (VO1)
LED 21: TYPE	Self-Reset
LED 22: OPERAND	ORD. CIERRE On (VO6)
LED 22: TYPE	Latched
LED 23: OPERAND	Z5 operada On (VO35)
LED 23: TYPE	Latched
LED 25: OPERAND	SETTING GROUP ACT 1
LED 25: TYPE	Self-Reset
LED 26: OPERAND	SETTING GROUP ACT 2
LED 26: TYPE	Self-Reset
LED 27: OPERAND	SETTING GROUP ACT 3
LED 27: TYPE	Self-Reset

USER-PROGRAMMABLE SELF TESTS

Battery Fail Function	Enabled

CONTROL PUSHBUTTONS

CPB 1: Function	Enabled
CPB 1: Events	Enabled
CPB 3: Function	Enabled
CPB 3: Events	Disabled

USER-DEFINABLE DISPLAYS

USER DISPLAY 1: Top Line	LINEA JAHUEL 154KV
USER DISPLAY 1: Bottom Line	SISTEMA 2
USER DISPLAY 1: Item 1	0
USER DISPLAY 1: Item 2	0
USER DISPLAY 1: Item 3	0
USER DISPLAY 1: Item 4	0
USER DISPLAY 1: Item 5	0

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VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

USER-DEFINABLE DISPLAYS (continued from last page)

USER DISPLAY 2: Top Line	LOCALIZACION FALLA
USER DISPLAY 2: Bottom Line	~ km
USER DISPLAY 2: Item 1	9061
USER DISPLAY 2: Item 2	0
USER DISPLAY 2: Item 3	0
USER DISPLAY 2: Item 4	0
USER DISPLAY 2: Item 5	0
USER DISPLAY 3: Top Line	IA IB IC
USER DISPLAY 3: Bottom Line	~ ~ ~
USER DISPLAY 3: Item 1	6144
USER DISPLAY 3: Item 2	6146
USER DISPLAY 3: Item 3	6148
USER DISPLAY 3: Item 4	0
USER DISPLAY 3: Item 5	0
USER DISPLAY 4: Top Line	P 3FASE
USER DISPLAY 4: Bottom Line	~
USER DISPLAY 4: Item 1	7168
USER DISPLAY 4: Item 2	0
USER DISPLAY 4: Item 3	0
USER DISPLAY 4: Item 4	0
USER DISPLAY 4: Item 5	0
USER DISPLAY 5: Top Line	Q 3FASE
USER DISPLAY 5: Bottom Line	~
USER DISPLAY 5: Item 1	7176
USER DISPLAY 5: Item 2	0
USER DISPLAY 5: Item 3	0
USER DISPLAY 5: Item 4	0
USER DISPLAY 5: Item 5	0
USER DISPLAY 6: Top Line	S 3FASE
USER DISPLAY 6: Bottom Line	~
USER DISPLAY 6: Item 1	7184
USER DISPLAY 6: Item 2	0
USER DISPLAY 6: Item 3	0
USER DISPLAY 6: Item 4	0
USER DISPLAY 6: Item 5	0
USER DISPLAY 7: Top Line	VOLTAJE BARRA
USER DISPLAY 7: Bottom Line	~
USER DISPLAY 7: Item 1	6673
USER DISPLAY 7: Item 2	0
USER DISPLAY 7: Item 3	0
USER DISPLAY 7: Item 4	0
USER DISPLAY 7: Item 5	0
USER DISPLAY 8: Top Line	COMMANDS
USER DISPLAY 8: Bottom Line	CLEAR RECORDS
USER DISPLAY 8: Item 1	0
USER DISPLAY 8: Item 2	0
USER DISPLAY 8: Item 3	0
USER DISPLAY 8: Item 4	0
USER DISPLAY 8: Item 5	0
Invoke and Scroll	ON

INSTALLATION

Relay Name	SISTEMA 2 JAHUEL

SYSTEM SETUP
AC INPUTS
CURRENT

CT F1: Phase CT Primary	600 A
CT F1: Phase CT Secondary	5 A
CT F1: Ground CT Primary	600 A
CT F1: Ground CT Secondary	5 A

VOLTAGE

VT F5: Phase VT Connection	Wye
VT F5: Phase VT Secondary	66.4 V
VT F5: Phase VT Ratio	1400.00 :1
VT F5: Auxiliary VT Connection	Vag
VT F5: Auxiliary VT Secondary	66.4 V
VT F5: Auxiliary VT Ratio	1400.00 :1

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VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

POWER SYSTEM

Nominal Frequency	50 Hz
Phase Rotation	ABC
Frequency And Phase Reference	LINEA (SRC 1)
Frequency Tracking Function	Enabled

SIGNAL SOURCES

SOURCE 1: Name	LINEA
SOURCE 1: Phase CT	F1
SOURCE 1: Ground CT	F1
SOURCE 1: Phase VT	F5
SOURCE 1: Auxiliary VT	None
SOURCE 2: Name	BARRA
SOURCE 2: Phase CT	None
SOURCE 2: Ground CT	None
SOURCE 2: Phase VT	None
SOURCE 2: Auxiliary VT	F5

BREAKERS

Breaker 1 Function	Enabled
Breaker 1 Push Button Control	Disabled
Breaker 1 Name	52A2
Breaker 1 Mode	3-Pole
Breaker 1 Open	OFF
Breaker 1 Close	CIERRE MANUA Off(W3a)
Breaker 1 Phase A/3-Pole	52A2 (a) On(H8c)
Breaker 1 Phase B	OFF
Breaker 1 Phase C	OFF
Breaker 1 External Alarm	OFF
Breaker 1 Alarm Delay	0.000 s
Breaker 1 Manual Close Recal Time	0.000 s
Breaker 1 Out Of Service	63-FALLA PRE On(H8a)

FLEXLOGIC

FLEXLOGIC EQUATION EDITOR

FlexLogic Entry 1	POWER SWING BLOCK
FlexLogic Entry 2	NEUTRAL TOC1 PKP
FlexLogic Entry 3	NOT
FlexLogic Entry 4	AND(2)
FlexLogic Entry 5	= POWER SWING (VO8)
FlexLogic Entry 6	ITE AC FALLA On(W4a)
FlexLogic Entry 7	POWER SWING UN/BLOCK
FlexLogic Entry 8	SRC1 VT FUSE FAIL OP
FlexLogic Entry 9	OR(3)
FlexLogic Entry 10	= BLQ Zonas PH (VO1)
FlexLogic Entry 11	PH DIST Z1 OP
FlexLogic Entry 12	PH DIST Z2 OP
FlexLogic Entry 13	PH DIST Z3 OP
FlexLogic Entry 14	PH DIST Z4 OP
FlexLogic Entry 15	PH DIST Z5 OP
FlexLogic Entry 16	GND DIST Z1 OP
FlexLogic Entry 17	GND DIST Z2 OP
FlexLogic Entry 18	GND DIST Z3 OP
FlexLogic Entry 19	GND DIST Z4 OP
FlexLogic Entry 20	GND DIST Z5 OP
FlexLogic Entry 21	OR(10)
FlexLogic Entry 22	PHASE TOC1 OP
FlexLogic Entry 23	NEUTRAL TOC1 OP
FlexLogic Entry 24	PHASE TOC2 OP
FlexLogic Entry 25	NEUTRAL TOC2 OP
FlexLogic Entry 26	PHASE IOC1 OP
FlexLogic Entry 27	NEUTRAL IOC1 OP
FlexLogic Entry 28	HYBRID POTT OP
FlexLogic Entry 29	LINE PICKUP OP
FlexLogic Entry 30	OR(8)
FlexLogic Entry 31	OR(2)
FlexLogic Entry 32	= TRIP GRAL (VO2)
FlexLogic Entry 33	BLQ Zonas PH On (VO1)
FlexLogic Entry 34	POWER SWING On (VO8)

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VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

FLEXLOGIC EQUATION EDITOR (continued from last page)

FlexLogic Entry 35	TRIP GRAL On (VO2)
FlexLogic Entry 36	OR(3)
FlexLogic Entry 37	= OSCILOGRAFIA (VO3)
FlexLogic Entry 38	PH DIST Z1 PKP
FlexLogic Entry 39	GND DIST Z1 PKP
FlexLogic Entry 40	PH DIST Z2 PKP
FlexLogic Entry 41	GND DIST Z2 PKP
FlexLogic Entry 42	OR(4)
FlexLogic Entry 43	= pkp Z1o z2 (VO4)
FlexLogic Entry 44	AR CLOSE BKR 1
FlexLogic Entry 45	= ORD. CIERRE (VO6)
FlexLogic Entry 46	TRIP 3-POLE
FlexLogic Entry 47	TIMER 1
FlexLogic Entry 48	= Alarma trip (VO10)
FlexLogic Entry 49	HYBRID POTT TX1
FlexLogic Entry 50	TIMER 2
FlexLogic Entry 51	= TX OPLAT (VO11)
FlexLogic Entry 52	HYBRID POTT TX1
FlexLogic Entry 53	TIMER 3
FlexLogic Entry 54	= TX MMOO (VO12)
FlexLogic Entry 55	GND DIST Z1 OP
FlexLogic Entry 56	PH DIST Z1 OP
FlexLogic Entry 57	OR(2)
FlexLogic Entry 58	= LED Z1 (VO13)
FlexLogic Entry 59	GND DIST Z2 OP
FlexLogic Entry 60	PH DIST Z2 OP
FlexLogic Entry 61	OR(2)
FlexLogic Entry 62	= LED Z2 (VO14)
FlexLogic Entry 63	PH DIST Z3 OP
FlexLogic Entry 64	GND DIST Z3 OP
FlexLogic Entry 65	OR(2)
FlexLogic Entry 66	= LED Z3 (VO15)
FlexLogic Entry 67	PH DIST Z4 OP
FlexLogic Entry 68	GND DIST Z4 OP
FlexLogic Entry 69	OR(2)
FlexLogic Entry 70	= LED Z4 (VO16)
FlexLogic Entry 71	79 conectado On(H7c)
FlexLogic Entry 72	AUTORI 79 On(W5a)
FlexLogic Entry 73	AND(2)
FlexLogic Entry 74	= 79 on (VO17)
FlexLogic Entry 75	79 on On (VO17)
FlexLogic Entry 76	NOT
FlexLogic Entry 77	= 79 off (VO18)
FlexLogic Entry 78	PH DIST Z1 PKP
FlexLogic Entry 79	PH DIST Z2 PKP
FlexLogic Entry 80	PH DIST Z3 PKP
FlexLogic Entry 81	PH DIST Z4 PKP
FlexLogic Entry 82	GND DIST Z1 PKP
FlexLogic Entry 83	GND DIST Z2 PKP
FlexLogic Entry 84	GND DIST Z3 PKP
FlexLogic Entry 85	GND DIST Z4 PKP
FlexLogic Entry 86	PHASE TOC1 PKP
FlexLogic Entry 87	NEUTRAL TOC1 PKP
FlexLogic Entry 88	LINE PICKUP PKP
FlexLogic Entry 89	OR(11)
FlexLogic Entry 90	= reset led (VO19)
FlexLogic Entry 91	RECEP JAHUEL On(W1a)
FlexLogic Entry 92	RECEP ITAHUE On(W1c)
FlexLogic Entry 93	OR(2)
FlexLogic Entry 94	= RECEP ACELER (VO22)
FlexLogic Entry 95	PH DIST Z1 OP
FlexLogic Entry 96	GND DIST Z1 OP
FlexLogic Entry 97	OR(2)
FlexLogic Entry 98	= OPERA ZONA 1 (VO23)
FlexLogic Entry 99	PH DIST Z2 OP
FlexLogic Entry 100	GND DIST Z2 OP
FlexLogic Entry 101	OR(2)
FlexLogic Entry 102	= OPERA ZONA 2 (VO24)
FlexLogic Entry 103	PH DIST Z3 OP

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VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

FLEXLOGIC EQUATION EDITOR (continued from last page)

FlexLogic Entry 104	PH DIST Z4 OP
FlexLogic Entry 105	GND DIST Z3 OP
FlexLogic Entry 106	GND DIST Z4 OP
FlexLogic Entry 107	OR(4)
FlexLogic Entry 108	= OPERA Z3/Z4 (VO25)
FlexLogic Entry 109	PHASE TOC1 OP
FlexLogic Entry 110	NEUTRAL IOC1 OP
FlexLogic Entry 111	NEUTRAL TOC1 OP
FlexLogic Entry 112	OR(3)
FlexLogic Entry 113	BLQ Zonas PH On (VO1)
FlexLogic Entry 114	NOT
FlexLogic Entry 115	AND(2)
FlexLogic Entry 116	= 67-67N (VO27)
FlexLogic Entry 117	PHASE TOC1 OP
FlexLogic Entry 118	NEUTRAL IOC1 OP
FlexLogic Entry 119	NEUTRAL TOC1 OP
FlexLogic Entry 120	OR(3)
FlexLogic Entry 121	BLQ Zonas PH On (VO1)
FlexLogic Entry 122	AND(2)
FlexLogic Entry 123	= 51-51N (VO28)
FlexLogic Entry 124	PHASE IOC1 OP
FlexLogic Entry 125	NEUTRAL IOC1 OP
FlexLogic Entry 126	OR(2)
FlexLogic Entry 127	= 50-50N (VO29)
FlexLogic Entry 128	ITE AC FALLA On(W4a)
FlexLogic Entry 129	ANY MAJOR ERROR
FlexLogic Entry 130	SRC1 VT FUSE FAIL OP
FlexLogic Entry 131	OR(3)
FlexLogic Entry 132	= Alarma f. re (VO7)
FlexLogic Entry 133	BLQ Zonas PH On (VO1)
FlexLogic Entry 134	LOAD ENCHR OP
FlexLogic Entry 135	OR(2)
FlexLogic Entry 136	= Load encroch (VO30)
FlexLogic Entry 137	Alarma f. re On (VO7)
FlexLogic Entry 138	NOT
FlexLogic Entry 139	= BLOQ 51 (VO31)
FlexLogic Entry 140	NTRL DIR OC1 REV
FlexLogic Entry 141	= REVERSE (VO32)
FlexLogic Entry 142	NTRL DIR OC1 FWD
FlexLogic Entry 143	= FORWARD (VO33)
FlexLogic Entry 144	BREAKER 1 OPEN
FlexLogic Entry 145	= BRK OPEN (VO34)
FlexLogic Entry 146	PH DIST Z5 OP
FlexLogic Entry 147	GND DIST Z5 OP
FlexLogic Entry 148	OR(2)
FlexLogic Entry 149	= Z5 operada (VO35)
FlexLogic Entry 150	RECEP JAHUEL On(W1a)
FlexLogic Entry 151	RECEP ITAHUE On(W1c)
FlexLogic Entry 152	SETTING GROUP ACT 1
FlexLogic Entry 153	AND(3)
FlexLogic Entry 154	RECEP JAHUEL On(W1a)
FlexLogic Entry 155	SETTING GROUP ACT 2
FlexLogic Entry 156	AND(2)
FlexLogic Entry 157	OR(2)
FlexLogic Entry 158	= RECEP 3P (VO36)
FlexLogic Entry 159	RECEP 3P On (VO36)
FlexLogic Entry 160	BREAKER 1 OPEN
FlexLogic Entry 161	AND(2)
FlexLogic Entry 162	= ECHO 3P (VO37)
FlexLogic Entry 163	52AP.CORTE On(W2c)
FlexLogic Entry 164	NOT
FlexLogic Entry 165	52B P. CORTE On(W2a)
FlexLogic Entry 166	SETTING GROUP ACT 1
FlexLogic Entry 167	AND(3)
FlexLogic Entry 168	CONTROL PUSHBUTTON 3 ON
FlexLogic Entry 169	POSITIVE ONE SHOT
FlexLogic Entry 170	SETTING GROUP ACT 1
FlexLogic Entry 171	AND(2)
FlexLogic Entry 172	OR(2)

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DESCRIPTION: (NONE)
TEXT COLOR

FLEXLOGIC EQUATION EDITOR (continued from last page)

FlexLogic Entry 173	= set grupo (VO38)
FlexLogic Entry 174	52AP.CORTE On(W2c)
FlexLogic Entry 175	52B P. CORTE On(W2a)
FlexLogic Entry 176	NOT
FlexLogic Entry 177	SETTING GROUP ACT 2
FlexLogic Entry 178	AND(3)
FlexLogic Entry 179	CONTROL PUSHBUTTON 3 ON
FlexLogic Entry 180	POSITIVE ONE SHOT
FlexLogic Entry 181	SETTING GROUP ACT 2
FlexLogic Entry 182	AND(2)
FlexLogic Entry 183	OR(2)
FlexLogic Entry 184	= reset grupo (VO39)
FlexLogic Entry 185	END

FLEXLOGIC TIMERS

Timer 1: Type	second
Timer 1: Pickup Delay	0
Timer 1: Dropout Delay	7
Timer 2: Type	millisecond
Timer 2: Pickup Delay	0
Timer 2: Dropout Delay	50
Timer 3: Type	millisecond
Timer 3: Pickup Delay	0
Timer 3: Dropout Delay	50

NON-VOLATILE LATCHES

LATCH 1: Function	Enabled
LATCH 1: Type	Reset Dominant
LATCH 1: Set	set grupo On (VO38)
LATCH 1: Reset	reset grupo On (VO39)
LATCH 1: Target	Disabled
LATCH 1: Events	Enabled

GROUPED ELEMENTS

GROUP 1

LINE PICKUP [GROUP 1]

Function	Enabled
Signal Source	LINEA (SRC 1)
Phase IOC Line Pickup	1.250 pu
UV Pickup	0.800 pu
Line End Open Pickup Delay	0.200 s
Line End Open Reset Delay	0.200 s
OV Pickup Delay	0.200 s
Autoreclose Coordination Bypass	Enabled
Autoreclose Coordination Pickup Delay	0.045 s
Autoreclose Coordination Reset Delay	0.005 s
Terminal Open	BREAKER 1 OPEN
AR Accelerate	OFF
Block	OFF
Target	Self-reset
Events	Enabled

DISTANCE

DISTANCE [GROUP 1]

Source	LINEA (SRC 1)
Memory Duration	10 cycles
Force Self-Polar	OFF
Force Mem-Polar	OFF

PHASE DISTANCE [GROUP 1]

PHASE DISTANCE Z1: Function	Enabled
PHASE DISTANCE Z1: Direction	Forward
PHASE DISTANCE Z1: Shape	Quad
PHASE DISTANCE Z1: Xfmr Vol Connection	None
PHASE DISTANCE Z1: Xfmr Curr Connection	None
PHASE DISTANCE Z1: Reach	2.74 ohms
PHASE DISTANCE Z1: RCA	90 deg
PHASE DISTANCE Z1: Rev Reach	0.02 ohms
PHASE DISTANCE Z1: Rev Reach RCA	78 deg

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DESCRIPTION: (NONE)
TEXT COLOR

PHASE DISTANCE [GROUP 1] (continued from last page)

PHASE DISTANCE Z1: Comp Limit	90 deg
PHASE DISTANCE Z1: DIR RCA	49 deg
PHASE DISTANCE Z1: DIR Comp Limit	71 deg
PHASE DISTANCE Z1: Quad Right Blinder	2.74 ohms
PHASE DISTANCE Z1: Quad Right Blinder RCA	78 deg
PHASE DISTANCE Z1: Quad Left Blinder	2.74 ohms
PHASE DISTANCE Z1: Quad Left Blinder RCA	78 deg
PHASE DISTANCE Z1: Supervision	0.100 pu
PHASE DISTANCE Z1: Volt Level	0.000 pu
PHASE DISTANCE Z1: Delay	0.000 s
PHASE DISTANCE Z1: Block	BLQ Zonas PH On (VO1)
PHASE DISTANCE Z1: Target	Self-reset
PHASE DISTANCE Z1: Events	Enabled
PHASE DISTANCE Z2: Function	Enabled
PHASE DISTANCE Z2: Direction	Forward
PHASE DISTANCE Z2: Shape	Quad
PHASE DISTANCE Z2: Xfmr Vol Connection	None
PHASE DISTANCE Z2: Xfmr Curr Connection	None
PHASE DISTANCE Z2: Reach	25.68 ohms
PHASE DISTANCE Z2: RCA	90 deg
PHASE DISTANCE Z2: Rev Reach	0.02 ohms
PHASE DISTANCE Z2: Rev Reach RCA	78 deg
PHASE DISTANCE Z2: Comp Limit	90 deg
PHASE DISTANCE Z2: DIR RCA	49 deg
PHASE DISTANCE Z2: DIR Comp Limit	71 deg
PHASE DISTANCE Z2: Quad Right Blinder	21.00 ohms
PHASE DISTANCE Z2: Quad Right Blinder RCA	78 deg
PHASE DISTANCE Z2: Quad Left Blinder	21.00 ohms
PHASE DISTANCE Z2: Quad Left Blinder RCA	78 deg
PHASE DISTANCE Z2: Supervision	0.100 pu
PHASE DISTANCE Z2: Volt Level	0.000 pu
PHASE DISTANCE Z2: Delay	65.000 s
PHASE DISTANCE Z2: Block	Load encroch On (VO30)
PHASE DISTANCE Z2: Target	Self-reset
PHASE DISTANCE Z2: Events	Enabled
PHASE DISTANCE Z3: Function	Enabled
PHASE DISTANCE Z3: Direction	Forward
PHASE DISTANCE Z3: Shape	Quad
PHASE DISTANCE Z3: Xfmr Vol Connection	None
PHASE DISTANCE Z3: Xfmr Curr Connection	None
PHASE DISTANCE Z3: Reach	5.52 ohms
PHASE DISTANCE Z3: RCA	90 deg
PHASE DISTANCE Z3: Rev Reach	0.02 ohms
PHASE DISTANCE Z3: Rev Reach RCA	78 deg
PHASE DISTANCE Z3: Comp Limit	90 deg
PHASE DISTANCE Z3: DIR RCA	49 deg
PHASE DISTANCE Z3: DIR Comp Limit	71 deg
PHASE DISTANCE Z3: Quad Right Blinder	5.52 ohms
PHASE DISTANCE Z3: Quad Right Blinder RCA	78 deg
PHASE DISTANCE Z3: Quad Left Blinder	5.52 ohms
PHASE DISTANCE Z3: Quad Left Blinder RCA	78 deg
PHASE DISTANCE Z3: Supervision	0.100 pu
PHASE DISTANCE Z3: Volt Level	0.000 pu
PHASE DISTANCE Z3: Delay	0.600 s
PHASE DISTANCE Z3: Block	BLQ Zonas PH On (VO1)
PHASE DISTANCE Z3: Target	Self-reset
PHASE DISTANCE Z3: Events	Enabled
PHASE DISTANCE Z4: Function	Enabled
PHASE DISTANCE Z4: Direction	Reverse
PHASE DISTANCE Z4: Shape	Quad
PHASE DISTANCE Z4: Xfmr Vol Connection	None
PHASE DISTANCE Z4: Xfmr Curr Connection	None
PHASE DISTANCE Z4: Reach	12.50 ohms
PHASE DISTANCE Z4: RCA	90 deg
PHASE DISTANCE Z4: Rev Reach	0.02 ohms
PHASE DISTANCE Z4: Rev Reach RCA	78 deg
PHASE DISTANCE Z4: Comp Limit	90 deg
PHASE DISTANCE Z4: DIR RCA	49 deg
PHASE DISTANCE Z4: DIR Comp Limit	71 deg

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DESCRIPTION: (NONE)
TEXT COLOR

PHASE DISTANCE [GROUP 1] (continued from last page)

PHASE DISTANCE Z4: Quad Right Blinder	12.50 ohms
PHASE DISTANCE Z4: Quad Right Blinder RCA	78 deg
PHASE DISTANCE Z4: Quad Left Blinder	12.50 ohms
PHASE DISTANCE Z4: Quad Left Blinder RCA	78 deg
PHASE DISTANCE Z4: Supervision	0.100 pu
PHASE DISTANCE Z4: Volt Level	0.000 pu
PHASE DISTANCE Z4: Delay	2.500 s
PHASE DISTANCE Z4: Block	Load encroch On (VO30)
PHASE DISTANCE Z4: Target	Self-reset
PHASE DISTANCE Z4: Events	Enabled

GROUND DISTANCE [GROUP 1]

GROUND DISTANCE Z1: Function	Enabled
GROUND DISTANCE Z1: Direction	Forward
GROUND DISTANCE Z1: Shape	Quad
GROUND DISTANCE Z1: Z0/Z1 Mag	3.21
GROUND DISTANCE Z1: Z0/Z1 Ang	2 deg
GROUND DISTANCE Z1: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z1: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z1: Reach	2.74 ohms
GROUND DISTANCE Z1: RCA	90 deg
GROUND DISTANCE Z1: Rev Reach	0.02 ohms
GROUND DISTANCE Z1: Rev Reach RCA	78 deg
GROUND DISTANCE Z1: POL Current	Zero-seq
GROUND DISTANCE Z1: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z1: Comp Limit	90 deg
GROUND DISTANCE Z1: DIR RCA	49 deg
GROUND DISTANCE Z1: DIR Comp Limit	70 deg
GROUND DISTANCE Z1: Quad Right Blinder	2.74 ohms
GROUND DISTANCE Z1: Quad Right Blinder RCA	78 deg
GROUND DISTANCE Z1: Quad Left Blinder	2.74 ohms
GROUND DISTANCE Z1: Quad Left Blinder RCA	79 deg
GROUND DISTANCE Z1: Supervision	0.100 pu
GROUND DISTANCE Z1: Volt Level	0.000 pu
GROUND DISTANCE Z1: Delay	0.000 s
GROUND DISTANCE Z1: Block	BLQ Zonas PH On (VO1)
GROUND DISTANCE Z1: Target	Self-reset
GROUND DISTANCE Z1: Events	Enabled
GROUND DISTANCE Z2: Function	Enabled
GROUND DISTANCE Z2: Direction	Forward
GROUND DISTANCE Z2: Shape	Quad
GROUND DISTANCE Z2: Z0/Z1 Mag	3.21
GROUND DISTANCE Z2: Z0/Z1 Ang	2 deg
GROUND DISTANCE Z2: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z2: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z2: Reach	25.68 ohms
GROUND DISTANCE Z2: RCA	90 deg
GROUND DISTANCE Z2: Rev Reach	0.02 ohms
GROUND DISTANCE Z2: Rev Reach RCA	78 deg
GROUND DISTANCE Z2: POL Current	Zero-seq
GROUND DISTANCE Z2: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z2: Comp Limit	90 deg
GROUND DISTANCE Z2: DIR RCA	49 deg
GROUND DISTANCE Z2: DIR Comp Limit	71 deg
GROUND DISTANCE Z2: Quad Right Blinder	21.00 ohms
GROUND DISTANCE Z2: Quad Right Blinder RCA	78 deg
GROUND DISTANCE Z2: Quad Left Blinder	21.00 ohms
GROUND DISTANCE Z2: Quad Left Blinder RCA	78 deg
GROUND DISTANCE Z2: Supervision	0.100 pu
GROUND DISTANCE Z2: Volt Level	0.000 pu
GROUND DISTANCE Z2: Delay	65.000 s
GROUND DISTANCE Z2: Block	Load encroch On (VO30)
GROUND DISTANCE Z2: Target	Self-reset
GROUND DISTANCE Z2: Events	Enabled
GROUND DISTANCE Z3: Function	Enabled
GROUND DISTANCE Z3: Direction	Forward
GROUND DISTANCE Z3: Shape	Quad
GROUND DISTANCE Z3: Z0/Z1 Mag	3.21
GROUND DISTANCE Z3: Z0/Z1 Ang	2 deg

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TEXT COLOR

GROUND DISTANCE [GROUP 1] (continued from last page)

GROUND DISTANCE Z3: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z3: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z3: Reach	5.52 ohms
GROUND DISTANCE Z3: RCA	90 deg
GROUND DISTANCE Z3: Rev Reach	0.02 ohms
GROUND DISTANCE Z3: Rev Reach RCA	78 deg
GROUND DISTANCE Z3: POL Current	Zero-seq
GROUND DISTANCE Z3: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z3: Comp Limit	90 deg
GROUND DISTANCE Z3: DIR RCA	49 deg
GROUND DISTANCE Z3: DIR Comp Limit	71 deg
GROUND DISTANCE Z3: Quad Right Blinder	5.52 ohms
GROUND DISTANCE Z3: Quad Right Blinder RCA	78 deg
GROUND DISTANCE Z3: Quad Left Blinder	5.52 ohms
GROUND DISTANCE Z3: Quad Left Blinder RCA	78 deg
GROUND DISTANCE Z3: Supervision	0.100 pu
GROUND DISTANCE Z3: Volt Level	0.000 pu
GROUND DISTANCE Z3: Delay	0.600 s
GROUND DISTANCE Z3: Block	BLQ Zonas PH On (VO1)
GROUND DISTANCE Z3: Target	Self-reset
GROUND DISTANCE Z3: Events	Enabled
GROUND DISTANCE Z4: Function	Enabled
GROUND DISTANCE Z4: Direction	Reverse
GROUND DISTANCE Z4: Shape	Quad
GROUND DISTANCE Z4: Z0/Z1 Mag	3.21
GROUND DISTANCE Z4: Z0/Z1 Ang	2 deg
GROUND DISTANCE Z4: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z4: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z4: Reach	12.50 ohms
GROUND DISTANCE Z4: RCA	90 deg
GROUND DISTANCE Z4: Rev Reach	0.02 ohms
GROUND DISTANCE Z4: Rev Reach RCA	78 deg
GROUND DISTANCE Z4: POL Current	Zero-seq
GROUND DISTANCE Z4: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z4: Comp Limit	90 deg
GROUND DISTANCE Z4: DIR RCA	49 deg
GROUND DISTANCE Z4: DIR Comp Limit	71 deg
GROUND DISTANCE Z4: Quad Right Blinder	12.50 ohms
GROUND DISTANCE Z4: Quad Right Blinder RCA	78 deg
GROUND DISTANCE Z4: Quad Left Blinder	12.50 ohms
GROUND DISTANCE Z4: Quad Left Blinder RCA	78 deg
GROUND DISTANCE Z4: Supervision	0.100 pu
GROUND DISTANCE Z4: Volt Level	0.000 pu
GROUND DISTANCE Z4: Delay	2.500 s
GROUND DISTANCE Z4: Block	Load encroch On (VO30)
GROUND DISTANCE Z4: Target	Self-reset
GROUND DISTANCE Z4: Events	Enabled
GROUND DISTANCE Z5: Function	Enabled
GROUND DISTANCE Z5: Direction	Forward
GROUND DISTANCE Z5: Shape	Quad
GROUND DISTANCE Z5: Z0/Z1 Mag	3.21
GROUND DISTANCE Z5: Z0/Z1 Ang	2 deg
GROUND DISTANCE Z5: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z5: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z5: Reach	13.00 ohms
GROUND DISTANCE Z5: RCA	90 deg
GROUND DISTANCE Z5: Rev Reach	0.02 ohms
GROUND DISTANCE Z5: Rev Reach RCA	78 deg
GROUND DISTANCE Z5: POL Current	Zero-seq
GROUND DISTANCE Z5: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z5: Comp Limit	90 deg
GROUND DISTANCE Z5: DIR RCA	49 deg
GROUND DISTANCE Z5: DIR Comp Limit	71 deg
GROUND DISTANCE Z5: Quad Right Blinder	13.00 ohms
GROUND DISTANCE Z5: Quad Right Blinder RCA	78 deg
GROUND DISTANCE Z5: Quad Left Blinder	13.00 ohms
GROUND DISTANCE Z5: Quad Left Blinder RCA	78 deg
GROUND DISTANCE Z5: Supervision	0.100 pu
GROUND DISTANCE Z5: Volt Level	0.000 pu

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TEXT COLOR

GROUND DISTANCE [GROUP 1] (continued from last page)

GROUND DISTANCE Z5: Delay	1.500 s
GROUND DISTANCE Z5: Block	Load encroch On (VO30)
GROUND DISTANCE Z5: Target	Self-reset
GROUND DISTANCE Z5: Events	Enabled

POWER SWING DETECT [GROUP 1]

Function	Enabled
Source	LINEA (SRC 1)
Shape	Quad Shape
Mode	Two Step
Supv	0.200 pu
Fwd Reach	17.50 ohms
Quad Fwd Mid	18.20 ohms
Quad Fwd Out	18.20 ohms
Fwd Rca	78 deg
Rev Reach	16.50 ohms
Quad Rev Mid	17.20 ohms
Quad Rev Out	17.20 ohms
Rev Rca	78 deg
Outer Limit Angle	85 deg
Middle Limit Angle	90 deg
Inner Limit Angle	60 deg
Outer Rgt Bld	15.20 ohms
Outer Lft Bld	14.20 ohms
Midle Rgt Bld	15.20 ohms
Midle Lft Bld	14.20 ohms
Inner Rgt Bld	14.50 ohms
Inner Lft Bld	13.50 ohms
Delay 1 Pickup	0.020 s
Delay 1 Reset	0.050 s
Delay 2 Pickup	0.017 s
Delay 3 Pickup	0.009 s
Delay 4 Pickup	0.017 s
Seal-In Delay	0.000 s
Trip Mode	Delayed
Block	NEUTRAL TOC1 PKP
Target	Self-reset
Event	Enabled

LOAD ENCROACHMENT [GROUP 1]

Function	Enabled
Source	LINEA (SRC 1)
Min Volt	0.800 pu
Reach	9.14 ohms
Angle	35 deg
Pickup Delay	0.000 s
Reset Delay	0.000 s
Block	OFF
Target	Disabled
Events	Disabled

PHASE CURRENT

PHASE TOC [GROUP 1]

PHASE TOC1: Function	Enabled
PHASE TOC1: Signal Source	LINEA (SRC 1)
PHASE TOC1: Input	Phasor
PHASE TOC1: Pickup	1.200 pu
PHASE TOC1: Curve	IEC Curve A
PHASE TOC1: TD Multiplier	0.15
PHASE TOC1: Reset	Instantaneous
PHASE TOC1: Voltage Restraint	Disabled
PHASE TOC1: Block A	BLOQ 51 On (VO31)
PHASE TOC1: Block B	BLOQ 51 On (VO31)
PHASE TOC1: Block C	BLOQ 51 On (VO31)
PHASE TOC1: Target	Self-reset
PHASE TOC1: Events	Enabled

PHASE DIRECTIONAL [GROUP 1]

PHASE DIR1: Function	Enabled

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DESCRIPTION: (NONE)
TEXT COLOR

PHASE DIRECTIONAL [GROUP 1] (continued from last page)

PHASE DIR1: Source	LINEA (SRC 1)
PHASE DIR1: Block	OFF
PHASE DIR1: ECA	45 deg
PHASE DIR1: Pol V Threshold	0.700 pu
PHASE DIR1: Block when V Mem Exp	No
PHASE DIR1: Target	Disabled
PHASE DIR1: Events	Disabled

NEUTRAL CURRENT

NEUTRAL TOC [GROUP 1]

NEUTRAL TOC1: Function	Enabled
NEUTRAL TOC1: Source	LINEA (SRC 1)
NEUTRAL TOC1: Input	Phasor
NEUTRAL TOC1: Pickup	0.050 pu
NEUTRAL TOC1: Curve	IEC Curve A
NEUTRAL TOC1: TD Multiplier	0.40
NEUTRAL TOC1: Reset	Instantaneous
NEUTRAL TOC1: Block	NEG SEQ DIR OC1 REV
NEUTRAL TOC1: Target	Self-reset
NEUTRAL TOC1: Events	Enabled

NEGATIVE SEQUENCE CURRENT

NEGATIVE SEQUENCE DIRECTIONAL OC [GROUP 1]

NEGATIVE SEQ DIR OC1: Function	Enabled
NEGATIVE SEQ DIR OC1: Source	LINEA (SRC 1)
NEGATIVE SEQ DIR OC1: Offset	0.00 ohms
NEGATIVE SEQ DIR OC1: Type	Neg Sequence
NEGATIVE SEQ DIR OC1: POS SEQ Restraint	0.000
NEGATIVE SEQ DIR OC1: Forward ECA	80 ° Lag
NEGATIVE SEQ DIR OC1: Forward Limit Angle	80 deg
NEGATIVE SEQ DIR OC1: Forward Pickup	0.10 pu
NEGATIVE SEQ DIR OC1: Reverse Limit Angle	80 deg
NEGATIVE SEQ DIR OC1: Reverse Pickup	0.10 pu
NEGATIVE SEQ DIR OC1: Block	SRC1 VT FUSE FAIL OP
NEGATIVE SEQ DIR OC1: Target	Self-reset
NEGATIVE SEQ DIR OC1: Events	Enabled

BREAKER FAILURE [GROUP 1]

BF1: Function	Enabled
BF1: Mode	3-Pole
BF1: Source	LINEA (SRC 1)
BF1: Current Supervision	Yes
BF1: Use Seal-In	Yes
BF1: Three Pole Initiate	TRIP 3-POLE
BF1: Block	OFF
BF1: Phase Current Supv Pickup	1.200 pu
BF1: Neutral Current Supv Pickup	0.416 pu
BF1: Use Timer 1	Yes
BF1: Timer 1 Pickup Delay	0.200 s
BF1: Use Timer 2	No
BF1: Timer 2 Pickup Delay	0.200 s
BF1: Use Timer 3	No
BF1: Timer 3 Pickup Delay	0.000 s
BF1: Breaker Pos1 Phase A/3P	52A2 (a) On(H8c)
BF1: Breaker Pos2 Phase A/3P	OFF
BF1: Breaker Test On	OFF
BF1: Phase Current HiSet Pickup	1.200 pu
BF1: Neutral Current HiSet Pickup	0.416 pu
BF1: Phase Current LoSet Pickup	1.200 pu
BF1: Neutral Current LoSet Pickup	0.416 pu
BF1: LoSet Time Delay	0.000 s
BF1: Trip Dropout Delay	0.000 s
BF1: Target	Latched
BF1: Events	Enabled
BF1: Phase A Initiate	OFF
BF1: Phase B Initiate	OFF
BF1: Phase C Initiate	OFF
BF1: Breaker Pos1 Phase B	OFF
BF1: Breaker Pos1 Phase C	OFF

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VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

BREAKER FAILURE [GROUP 1] (continued from last page)

BF1: Breaker Pos2 Phase B	OFF
BF1: Breaker Pos2 Phase C	OFF

GROUP 2

LINE PICKUP [GROUP 2]

Function	Enabled
Signal Source	LINEA (SRC 1)
Phase IOC Line Pickup	2.500 pu
UV Pickup	0.800 pu
Line End Open Pickup Delay	0.000 s
Line End Open Reset Delay	0.200 s
OV Pickup Delay	0.200 s
Autoreclose Coordination Bypass	Disabled
Autoreclose Coordination Pickup Delay	0.045 s
Autoreclose Coordination Reset Delay	0.005 s
Terminal Open	BREAKER 1 OPEN
AR Accelerate	OFF
Block	OFF
Target	Self-reset
Events	Enabled

DISTANCE

DISTANCE [GROUP 2]

Source	LINEA (SRC 1)
Memory Duration	10 cycles
Force Self-Polar	OFF
Force Mem-Polar	OFF

PHASE DISTANCE [GROUP 2]

PHASE DISTANCE Z1: Function	Enabled
PHASE DISTANCE Z1: Direction	Forward
PHASE DISTANCE Z1: Shape	Quad
PHASE DISTANCE Z1: Xfmr Vol Connection	None
PHASE DISTANCE Z1: Xfmr Curr Connection	None
PHASE DISTANCE Z1: Reach	1.72 ohms
PHASE DISTANCE Z1: RCA	90 deg
PHASE DISTANCE Z1: Rev Reach	1.72 ohms
PHASE DISTANCE Z1: Rev Reach RCA	79 deg
PHASE DISTANCE Z1: Comp Limit	90 deg
PHASE DISTANCE Z1: DIR RCA	45 deg
PHASE DISTANCE Z1: DIR Comp Limit	79 deg
PHASE DISTANCE Z1: Quad Right Blinder	1.72 ohms
PHASE DISTANCE Z1: Quad Right Blinder RCA	79 deg
PHASE DISTANCE Z1: Quad Left Blinder	10.00 ohms
PHASE DISTANCE Z1: Quad Left Blinder RCA	79 deg
PHASE DISTANCE Z1: Supervision	0.200 pu
PHASE DISTANCE Z1: Volt Level	0.000 pu
PHASE DISTANCE Z1: Delay	0.000 s
PHASE DISTANCE Z1: Block	BLQ Zonas PH On (VO1)
PHASE DISTANCE Z1: Target	Self-reset
PHASE DISTANCE Z1: Events	Enabled
PHASE DISTANCE Z2: Function	Enabled
PHASE DISTANCE Z2: Direction	Forward
PHASE DISTANCE Z2: Shape	Quad
PHASE DISTANCE Z2: Xfmr Vol Connection	None
PHASE DISTANCE Z2: Xfmr Curr Connection	None
PHASE DISTANCE Z2: Reach	4.00 ohms
PHASE DISTANCE Z2: RCA	90 deg
PHASE DISTANCE Z2: Rev Reach	4.00 ohms
PHASE DISTANCE Z2: Rev Reach RCA	79 deg
PHASE DISTANCE Z2: Comp Limit	90 deg
PHASE DISTANCE Z2: DIR RCA	45 deg
PHASE DISTANCE Z2: DIR Comp Limit	79 deg
PHASE DISTANCE Z2: Quad Right Blinder	4.00 ohms
PHASE DISTANCE Z2: Quad Right Blinder RCA	79 deg
PHASE DISTANCE Z2: Quad Left Blinder	10.00 ohms
PHASE DISTANCE Z2: Quad Left Blinder RCA	79 deg
PHASE DISTANCE Z2: Supervision	0.200 pu
PHASE DISTANCE Z2: Volt Level	0.000 pu

RANCAGUA_LIAAJAH1_A2_S2_140527.URS
Y:\CRAP\ARCHIVOS DE CONFIGURACIÝN\04_OCS\RANCAGUA
DEVICE DEFINITION
FILES
ORDER CODE: D60-G00-HCL-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

PHASE DISTANCE [GROUP 2] (continued from last page)

PHASE DISTANCE Z2: Delay	65.535 s
PHASE DISTANCE Z2: Block	BLQ Zonas PH On (VO1)
PHASE DISTANCE Z2: Target	Self-reset
PHASE DISTANCE Z2: Events	Enabled
PHASE DISTANCE Z3: Function	Enabled
PHASE DISTANCE Z3: Direction	Forward
PHASE DISTANCE Z3: Shape	Quad
PHASE DISTANCE Z3: Xfmr Vol Connection	None
PHASE DISTANCE Z3: Xfmr Curr Connection	None
PHASE DISTANCE Z3: Reach	2.95 ohms
PHASE DISTANCE Z3: RCA	90 deg
PHASE DISTANCE Z3: Rev Reach	2.95 ohms
PHASE DISTANCE Z3: Rev Reach RCA	79 deg
PHASE DISTANCE Z3: Comp Limit	90 deg
PHASE DISTANCE Z3: DIR RCA	45 deg
PHASE DISTANCE Z3: DIR Comp Limit	79 deg
PHASE DISTANCE Z3: Quad Right Blinder	2.95 ohms
PHASE DISTANCE Z3: Quad Right Blinder RCA	79 deg
PHASE DISTANCE Z3: Quad Left Blinder	10.00 ohms
PHASE DISTANCE Z3: Quad Left Blinder RCA	79 deg
PHASE DISTANCE Z3: Supervision	0.200 pu
PHASE DISTANCE Z3: Volt Level	0.000 pu
PHASE DISTANCE Z3: Delay	0.400 s
PHASE DISTANCE Z3: Block	BLQ Zonas PH On (VO1)
PHASE DISTANCE Z3: Target	Self-reset
PHASE DISTANCE Z3: Events	Enabled
PHASE DISTANCE Z4: Function	Enabled
PHASE DISTANCE Z4: Direction	Reverse
PHASE DISTANCE Z4: Shape	Quad
PHASE DISTANCE Z4: Xfmr Vol Connection	None
PHASE DISTANCE Z4: Xfmr Curr Connection	None
PHASE DISTANCE Z4: Reach	2.00 ohms
PHASE DISTANCE Z4: RCA	90 deg
PHASE DISTANCE Z4: Rev Reach	2.00 ohms
PHASE DISTANCE Z4: Rev Reach RCA	79 deg
PHASE DISTANCE Z4: Comp Limit	90 deg
PHASE DISTANCE Z4: DIR RCA	45 deg
PHASE DISTANCE Z4: DIR Comp Limit	79 deg
PHASE DISTANCE Z4: Quad Right Blinder	2.00 ohms
PHASE DISTANCE Z4: Quad Right Blinder RCA	79 deg
PHASE DISTANCE Z4: Quad Left Blinder	10.00 ohms
PHASE DISTANCE Z4: Quad Left Blinder RCA	79 deg
PHASE DISTANCE Z4: Supervision	0.200 pu
PHASE DISTANCE Z4: Volt Level	0.000 pu
PHASE DISTANCE Z4: Delay	2.000 s
PHASE DISTANCE Z4: Block	BLQ Zonas PH On (VO1)
PHASE DISTANCE Z4: Target	Self-reset
PHASE DISTANCE Z4: Events	Enabled
PHASE DISTANCE Z5: Function	Enabled
PHASE DISTANCE Z5: Direction	Forward
PHASE DISTANCE Z5: Shape	Quad
PHASE DISTANCE Z5: Xfmr Vol Connection	None
PHASE DISTANCE Z5: Xfmr Curr Connection	None
PHASE DISTANCE Z5: Reach	8.90 ohms
PHASE DISTANCE Z5: RCA	90 deg
PHASE DISTANCE Z5: Rev Reach	8.90 ohms
PHASE DISTANCE Z5: Rev Reach RCA	79 deg
PHASE DISTANCE Z5: Comp Limit	90 deg
PHASE DISTANCE Z5: DIR RCA	45 deg
PHASE DISTANCE Z5: DIR Comp Limit	79 deg
PHASE DISTANCE Z5: Quad Right Blinder	8.90 ohms
PHASE DISTANCE Z5: Quad Right Blinder RCA	79 deg
PHASE DISTANCE Z5: Quad Left Blinder	10.00 ohms
PHASE DISTANCE Z5: Quad Left Blinder RCA	79 deg
PHASE DISTANCE Z5: Supervision	0.200 pu
PHASE DISTANCE Z5: Volt Level	0.000 pu
PHASE DISTANCE Z5: Delay	2.000 s
PHASE DISTANCE Z5: Block	BLQ Zonas PH On (VO1)
PHASE DISTANCE Z5: Target	Self-reset

RANCAGUA_LIAAJAH1_A2_S2_140527.URS
Y:\CRAP\ARCHIVOS DE CONFIGURACIÝN\04_OCS\RANCAGUA
DEVICE DEFINITION
FILES
ORDER CODE: D60-G00-HCL-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

PHASE DISTANCE [GROUP 2] (continued from last page)

PHASE DISTANCE Z5: Events	Enabled

GROUND DISTANCE [GROUP 2]

GROUND DISTANCE Z1: Function	Enabled
GROUND DISTANCE Z1: Direction	Forward
GROUND DISTANCE Z1: Shape	Quad
GROUND DISTANCE Z1: Z0/Z1 Mag	3.36
GROUND DISTANCE Z1: Z0/Z1 Ang	1 deg
GROUND DISTANCE Z1: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z1: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z1: Reach	1.72 ohms
GROUND DISTANCE Z1: RCA	90 deg
GROUND DISTANCE Z1: Rev Reach	1.72 ohms
GROUND DISTANCE Z1: Rev Reach RCA	79 deg
GROUND DISTANCE Z1: POL Current	Zero-seq
GROUND DISTANCE Z1: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z1: Comp Limit	90 deg
GROUND DISTANCE Z1: DIR RCA	45 deg
GROUND DISTANCE Z1: DIR Comp Limit	79 deg
GROUND DISTANCE Z1: Quad Right Blinder	3.44 ohms
GROUND DISTANCE Z1: Quad Right Blinder RCA	79 deg
GROUND DISTANCE Z1: Quad Left Blinder	3.44 ohms
GROUND DISTANCE Z1: Quad Left Blinder RCA	79 deg
GROUND DISTANCE Z1: Supervision	0.200 pu
GROUND DISTANCE Z1: Volt Level	0.000 pu
GROUND DISTANCE Z1: Delay	0.000 s
GROUND DISTANCE Z1: Block	BLQ Zonas PH On (VO1)
GROUND DISTANCE Z1: Target	Self-reset
GROUND DISTANCE Z1: Events	Enabled
GROUND DISTANCE Z2: Function	Enabled
GROUND DISTANCE Z2: Direction	Forward
GROUND DISTANCE Z2: Shape	Quad
GROUND DISTANCE Z2: Z0/Z1 Mag	3.36
GROUND DISTANCE Z2: Z0/Z1 Ang	1 deg
GROUND DISTANCE Z2: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z2: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z2: Reach	4.00 ohms
GROUND DISTANCE Z2: RCA	90 deg
GROUND DISTANCE Z2: Rev Reach	4.00 ohms
GROUND DISTANCE Z2: Rev Reach RCA	79 deg
GROUND DISTANCE Z2: POL Current	Zero-seq
GROUND DISTANCE Z2: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z2: Comp Limit	90 deg
GROUND DISTANCE Z2: DIR RCA	45 deg
GROUND DISTANCE Z2: DIR Comp Limit	79 deg
GROUND DISTANCE Z2: Quad Right Blinder	8.00 ohms
GROUND DISTANCE Z2: Quad Right Blinder RCA	79 deg
GROUND DISTANCE Z2: Quad Left Blinder	8.00 ohms
GROUND DISTANCE Z2: Quad Left Blinder RCA	79 deg
GROUND DISTANCE Z2: Supervision	0.100 pu
GROUND DISTANCE Z2: Volt Level	0.000 pu
GROUND DISTANCE Z2: Delay	65.535 s
GROUND DISTANCE Z2: Block	BLQ Zonas PH On (VO1)
GROUND DISTANCE Z2: Target	Latched
GROUND DISTANCE Z2: Events	Enabled
GROUND DISTANCE Z3: Function	Enabled
GROUND DISTANCE Z3: Direction	Forward
GROUND DISTANCE Z3: Shape	Quad
GROUND DISTANCE Z3: Z0/Z1 Mag	3.36
GROUND DISTANCE Z3: Z0/Z1 Ang	1 deg
GROUND DISTANCE Z3: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z3: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z3: Reach	4.00 ohms
GROUND DISTANCE Z3: RCA	90 deg
GROUND DISTANCE Z3: Rev Reach	4.00 ohms
GROUND DISTANCE Z3: Rev Reach RCA	79 deg
GROUND DISTANCE Z3: POL Current	Zero-seq
GROUND DISTANCE Z3: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z3: Comp Limit	90 deg

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DEVICE DEFINITION
FILES
ORDER CODE: D60-G00-HCL-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

GROUND DISTANCE [GROUP 2] (continued from last page)

GROUND DISTANCE Z3: DIR RCA	45 deg
GROUND DISTANCE Z3: DIR Comp Limit	79 deg
GROUND DISTANCE Z3: Quad Right Blinder	8.00 ohms
GROUND DISTANCE Z3: Quad Right Blinder RCA	79 deg
GROUND DISTANCE Z3: Quad Left Blinder	8.00 ohms
GROUND DISTANCE Z3: Quad Left Blinder RCA	79 deg
GROUND DISTANCE Z3: Supervision	0.100 pu
GROUND DISTANCE Z3: Volt Level	0.000 pu
GROUND DISTANCE Z3: Delay	0.400 s
GROUND DISTANCE Z3: Block	BLQ Zonas PH On (VO1)
GROUND DISTANCE Z3: Target	Latched
GROUND DISTANCE Z3: Events	Enabled
GROUND DISTANCE Z4: Function	Enabled
GROUND DISTANCE Z4: Direction	Reverse
GROUND DISTANCE Z4: Shape	Quad
GROUND DISTANCE Z4: Z0/Z1 Mag	3.36
GROUND DISTANCE Z4: Z0/Z1 Ang	1 deg
GROUND DISTANCE Z4: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z4: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z4: Reach	2.00 ohms
GROUND DISTANCE Z4: RCA	90 deg
GROUND DISTANCE Z4: Rev Reach	2.00 ohms
GROUND DISTANCE Z4: Rev Reach RCA	79 deg
GROUND DISTANCE Z4: POL Current	Zero-seq
GROUND DISTANCE Z4: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z4: Comp Limit	90 deg
GROUND DISTANCE Z4: DIR RCA	45 deg
GROUND DISTANCE Z4: DIR Comp Limit	79 deg
GROUND DISTANCE Z4: Quad Right Blinder	4.00 ohms
GROUND DISTANCE Z4: Quad Right Blinder RCA	79 deg
GROUND DISTANCE Z4: Quad Left Blinder	4.00 ohms
GROUND DISTANCE Z4: Quad Left Blinder RCA	79 deg
GROUND DISTANCE Z4: Supervision	0.100 pu
GROUND DISTANCE Z4: Volt Level	0.000 pu
GROUND DISTANCE Z4: Delay	2.000 s
GROUND DISTANCE Z4: Block	BLQ Zonas PH On (VO1)
GROUND DISTANCE Z4: Target	Self-reset
GROUND DISTANCE Z4: Events	Enabled
GROUND DISTANCE Z5: Function	Enabled
GROUND DISTANCE Z5: Direction	Forward
GROUND DISTANCE Z5: Shape	Quad
GROUND DISTANCE Z5: Z0/Z1 Mag	3.36
GROUND DISTANCE Z5: Z0/Z1 Ang	1 deg
GROUND DISTANCE Z5: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z5: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z5: Reach	8.90 ohms
GROUND DISTANCE Z5: RCA	90 deg
GROUND DISTANCE Z5: Rev Reach	8.90 ohms
GROUND DISTANCE Z5: Rev Reach RCA	79 deg
GROUND DISTANCE Z5: POL Current	Zero-seq
GROUND DISTANCE Z5: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z5: Comp Limit	90 deg
GROUND DISTANCE Z5: DIR RCA	45 deg
GROUND DISTANCE Z5: DIR Comp Limit	79 deg
GROUND DISTANCE Z5: Quad Right Blinder	17.00 ohms
GROUND DISTANCE Z5: Quad Right Blinder RCA	79 deg
GROUND DISTANCE Z5: Quad Left Blinder	17.00 ohms
GROUND DISTANCE Z5: Quad Left Blinder RCA	79 deg
GROUND DISTANCE Z5: Supervision	0.100 pu
GROUND DISTANCE Z5: Volt Level	0.000 pu
GROUND DISTANCE Z5: Delay	2.000 s
GROUND DISTANCE Z5: Block	BLQ Zonas PH On (VO1)
GROUND DISTANCE Z5: Target	Self-reset
GROUND DISTANCE Z5: Events	Enabled

POWER SWING DETECT [GROUP 2]

Function	Enabled
Source	LINEA (SRC 1)
Shape	Quad Shape

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VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

POWER SWING DETECT [GROUP 2] (continued from last page)

Mode	Two Step
Supv	0.200 pu
Fwd Reach	11.00 ohms
Quad Fwd Mid	13.00 ohms
Quad Fwd Out	13.00 ohms
Fwd Rca	79 deg
Rev Reach	5.50 ohms
Quad Rev Mid	7.50 ohms
Quad Rev Out	7.50 ohms
Rev Rca	90 deg
Outer Limit Angle	120 deg
Middle Limit Angle	79 deg
Inner Limit Angle	74 deg
Outer Rgt Bld	12.20 ohms
Outer Lft Bld	10.00 ohms
Midle Rgt Bld	12.20 ohms
Midle Lft Bld	10.00 ohms
Inner Rgt Bld	10.20 ohms
Inner Lft Bld	8.00 ohms
Delay 1 Pickup	0.001 s
Delay 1 Reset	0.050 s
Delay 2 Pickup	0.017 s
Delay 3 Pickup	0.009 s
Delay 4 Pickup	0.017 s
Seal-In Delay	0.400 s
Trip Mode	Delayed
Block	NEUTRAL TOC1 PKP
Target	Self-reset
Event	Enabled

PHASE CURRENT

PHASE TOC [GROUP 2]

PHASE TOC1: Function	Enabled
PHASE TOC1: Signal Source	LINEA (SRC 1)
PHASE TOC1: Input	Phasor
PHASE TOC1: Pickup	0.690 pu
PHASE TOC1: Curve	IEC Curve A
PHASE TOC1: TD Multiplier	0.15
PHASE TOC1: Reset	Instantaneous
PHASE TOC1: Voltage Restraint	Disabled
PHASE TOC1: Block A	BLOQ 51 On (VO31)
PHASE TOC1: Block B	BLOQ 51 On (VO31)
PHASE TOC1: Block C	BLOQ 51 On (VO31)
PHASE TOC1: Target	Self-reset
PHASE TOC1: Events	Enabled

PHASE IOC [GROUP 2]

PHASE IOC1: Function	Enabled
PHASE IOC1: Source	LINEA (SRC 1)
PHASE IOC1: Pickup	1.800 pu
PHASE IOC1: Delay	0.01 s
PHASE IOC1: Reset Delay	0.00 s
PHASE IOC1: Block A	BLOQ 51 On (VO31)
PHASE IOC1: Block B	BLOQ 51 On (VO31)
PHASE IOC1: Block C	BLOQ 51 On (VO31)
PHASE IOC1: Target	Self-reset
PHASE IOC1: Events	Enabled

NEUTRAL CURRENT

NEUTRAL TOC [GROUP 2]

NEUTRAL TOC1: Function	Enabled
NEUTRAL TOC1: Source	LINEA (SRC 1)
NEUTRAL TOC1: Input	Phasor
NEUTRAL TOC1: Pickup	0.060 pu
NEUTRAL TOC1: Curve	IEC Curve A
NEUTRAL TOC1: TD Multiplier	0.75
NEUTRAL TOC1: Reset	Instantaneous
NEUTRAL TOC1: Block	NEG SEQ DIR OC1 REV
NEUTRAL TOC1: Target	Self-reset

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DEVICE DEFINITION
FILES
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VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

NEUTRAL TOC [GROUP 2] (continued from last page)

NEUTRAL TOC1: Events	Enabled

NEUTRAL IOC [GROUP 2]

NEUTRAL IOC1: Function	Enabled
NEUTRAL IOC1: Source	LINEA (SRC 1)
NEUTRAL IOC1: Pickup	2.000 pu
NEUTRAL IOC1: Delay	0.03 s
NEUTRAL IOC1: Reset Delay	0.00 s
NEUTRAL IOC1: Block	NTRL DIR OC1 REV
NEUTRAL IOC1: Target	Self-reset
NEUTRAL IOC1: Events	Enabled

NEGATIVE SEQUENCE CURRENT

NEGATIVE SEQUENCE DIRECTIONAL OC [GROUP 2]

NEGATIVE SEQ DIR OC1: Function	Enabled
NEGATIVE SEQ DIR OC1: Source	LINEA (SRC 1)
NEGATIVE SEQ DIR OC1: Offset	0.00 ohms
NEGATIVE SEQ DIR OC1: Type	Neg Sequence
NEGATIVE SEQ DIR OC1: POS SEQ Restraint	0.000
NEGATIVE SEQ DIR OC1: Forward ECA	81 ° Lag
NEGATIVE SEQ DIR OC1: Forward Limit Angle	80 deg
NEGATIVE SEQ DIR OC1: Forward Pickup	0.10 pu
NEGATIVE SEQ DIR OC1: Reverse Limit Angle	81 deg
NEGATIVE SEQ DIR OC1: Reverse Pickup	0.10 pu
NEGATIVE SEQ DIR OC1: Block	SRC1 VT FUSE FAIL OP
NEGATIVE SEQ DIR OC1: Target	Self-reset
NEGATIVE SEQ DIR OC1: Events	Enabled

BREAKER FAILURE [GROUP 2]

BF1: Function	Enabled
BF1: Mode	3-Pole
BF1: Source	LINEA (SRC 1)
BF1: Current Supervision	Yes
BF1: Use Seal-In	No
BF1: Three Pole Initiate	TRIP 3-POLE
BF1: Block	OFF
BF1: Phase Current Supv Pickup	1.200 pu
BF1: Neutral Current Supv Pickup	0.060 pu
BF1: Use Timer 1	Yes
BF1: Timer 1 Pickup Delay	0.200 s
BF1: Use Timer 2	No
BF1: Timer 2 Pickup Delay	0.000 s
BF1: Use Timer 3	No
BF1: Timer 3 Pickup Delay	0.000 s
BF1: Breaker Pos1 Phase A/3P	52A2 (a) On(H8c)
BF1: Breaker Pos2 Phase A/3P	OFF
BF1: Breaker Test On	OFF
BF1: Phase Current HiSet Pickup	1.200 pu
BF1: Neutral Current HiSet Pickup	0.060 pu
BF1: Phase Current LoSet Pickup	1.200 pu
BF1: Neutral Current LoSet Pickup	0.060 pu
BF1: LoSet Time Delay	0.000 s
BF1: Trip Dropout Delay	0.000 s
BF1: Target	Self-reset
BF1: Events	Enabled
BF1: Phase A Initiate	OFF
BF1: Phase B Initiate	OFF
BF1: Phase C Initiate	OFF
BF1: Breaker Pos1 Phase B	OFF
BF1: Breaker Pos1 Phase C	OFF
BF1: Breaker Pos2 Phase B	OFF
BF1: Breaker Pos2 Phase C	OFF

CONTROL ELEMENTS

SETTING GROUPS

Function	Enabled
Block	OFF
Group 2 Activate On	LATCH 1 ON
Group 3 Activate On	OFF

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DEVICE DEFINITION
FILES
ORDER CODE: D60-G00-HCL-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

SETTING GROUPS (continued from last page)

Group 4 Activate On	OFF
Group 5 Activate On	OFF
Group 6 Activate On	OFF
Group 1 Name	
Group 2 Name	
Group 3 Name	
Group 4 Name	
Group 5 Name	
Group 6 Name	
Events	Disabled

TRIP OUTPUT

Trip Mode	3 Pole Only
Trip 3-Pole Input1	TRIP GRAL On (VO2)
Trip 3-Pole Input2	OFF
Trip 3-Pole Input3	OFF
Trip 3-Pole Input4	OFF
Trip 3-Pole Input5	OFF
Trip 3-Pole Input6	OFF
Trip 1-Pole Input1	OFF
Trip 1-Pole Input2	OFF
Trip 1-Pole Input3	OFF
Trip 1-Pole Input4	OFF
Trip 1-Pole Input5	OFF
Trip 1-Pole Input6	OFF
Trip Reclose Input1	GND DIST Z1 OP
Trip Reclose Input2	PH DIST Z1 OP
Trip Reclose Input3	PUTT OP
Trip Reclose Input4	OFF
Trip Reclose Input5	OFF
Trip Reclose Input6	OFF
BKR Phase A Open	LINE PICKUP I<A
BKR Phase B Open	LINE PICKUP I<B
BKR Phase C Open	LINE PICKUP I<C
Trip Force 3-Pole	OFF
Trip Pilot Priority	0.000 s
Reverse Fault	OFF
Trip Delay On Evolving Faults	0.000 s
Trip Events	Enabled

MONITORING ELEMENTS

VT FUSE FAILURE

VT FUSE FAILURE 1: Function	Enabled

PILOT SCHEMES

1P HYBRID POTT SCHEME

Function	Enabled
Permissive Echo	Custom
Echo Condition	ECHO 3P On (VO37)
Weak Infeed	Disabled
W/I Condition	OFF
Rx Pickup Delay	0.001 s
Trans Block Pickup Delay	0.030 s
Trans Block Reset Delay	0.150 s
Echo Duration	0.100 s
Echo Lockout	0.250 s
Seal-In Delay	0.000 s
Gnd Dir OC Fwd	OFF
Gnd Dir OC Rev	NTRL DIR OC1 REV
No of Comm Bits	1
Rx1	RECEP 3P On (VO36)
Rx2	OFF
Rx3	OFF
Rx4	OFF
Target	Latched
Event	Enabled

AUTORECLOSE 1P

Function	Enabled

RANCAGUA_LIAAJAH1_A2_S2_140527.URS
Y:\CRAP\ARCHIVOS DE CONFIGURACIÝN\04_OCS\RANCAGUA
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VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

AUTORECLOSE 1P (continued from last page)

Mode	3 Pole - B
Max Number Of Shots	1
Block BKR1	OFF
Close Time BKR1	0.40 s
BKR Man Close	CIERRE MANUA On(W3a)
Blk Time Upon Man Cls	8.00 s
1-P Init	OFF
3-P Init	OFF
3-P TD Init	OFF
Multi P Fault	OFF
BKR 1 Pole Open	OFF
BKR 3 Pole Open	OFF
3-P Dead Time 1	0.40 s
3-P Dead Time 2	0.45 s
3-P Dead Time 3	2.00 s
3-P Dead Time 4	4.00 s
Extend Dead T1	OFF
Dead T1 Extension	0.15 s
Reset	OFF
Reset Time	10.00 s
BKR Closed	OFF
Block	79 off On (VO18)
Pause	OFF
Inc Seq Time	5.00 s
Block BKR2	OFF
Close Time BKR2	0.10 s
Transfer 1 to 2	No
Transfer 2 to 1	No
BKR1 Fail Option	Continue
BKR2 Fail Option	Continue
1-P Dead Time	1.00 s
BKR Sequence	1
Transfer Time	4.00 s
Event	Enabled

INPUTS/OUTPUTS

CONTACT INPUTS

[H7A] Contact Input 1 ID	79 DESCO
[H7A] Contact Input 1 Debounce Time	2.0 ms
[H7A] Contact Input 1 Events	Enabled
[H7C] Contact Input 2 ID	79 conectado
[H7C] Contact Input 2 Debounce Time	2.0 ms
[H7C] Contact Input 2 Events	Enabled
[H8A] Contact Input 3 ID	63-FALLA PRE
[H8A] Contact Input 3 Debounce Time	2.0 ms
[H8A] Contact Input 3 Events	Enabled
[H8C] Contact Input 4 ID	52A2 (a)
[H8C] Contact Input 4 Debounce Time	2.0 ms
[H8C] Contact Input 4 Events	Enabled
[U7A] Contact Input 5 ID	Cont Ip 5
[U7A] Contact Input 5 Debounce Time	2.0 ms
[U7A] Contact Input 5 Events	Disabled
[U7C] Contact Input 6 ID	Cont Ip 6
[U7C] Contact Input 6 Debounce Time	2.0 ms
[U7C] Contact Input 6 Events	Disabled
[U8A] Contact Input 7 ID	Cont Ip 7
[U8A] Contact Input 7 Debounce Time	2.0 ms
[U8A] Contact Input 7 Events	Disabled
[U8C] Contact Input 8 ID	Cont Ip 8
[U8C] Contact Input 8 Debounce Time	2.0 ms
[U8C] Contact Input 8 Events	Disabled
[W1A] Contact Input 9 ID	RECEP JAHUEL
[W1A] Contact Input 9 Debounce Time	2.0 ms
[W1A] Contact Input 9 Events	Enabled
[W1C] Contact Input 10 ID	RECEP ITAHUE
[W1C] Contact Input 10 Debounce Time	2.0 ms
[W1C] Contact Input 10 Events	Enabled
[W2A] Contact Input 11 ID	52B P. CORTE
[W2A] Contact Input 11 Debounce Time	2.0 ms

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VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

CONTACT INPUTS (continued from last page)

[W2A] Contact Input 11 Events	Enabled
[W2C] Contact Input 12 ID	52AP.CORTE
[W2C] Contact Input 12 Debounce Time	2.0 ms
[W2C] Contact Input 12 Events	Enabled
[W3A] Contact Input 13 ID	CIERRE MANUA
[W3A] Contact Input 13 Debounce Time	2.0 ms
[W3A] Contact Input 13 Events	Enabled
[W3C] Contact Input 14 ID	TELE DESCONE
[W3C] Contact Input 14 Debounce Time	2.0 ms
[W3C] Contact Input 14 Events	Disabled
[W4A] Contact Input 15 ID	ITE AC FALLA
[W4A] Contact Input 15 Debounce Time	2.0 ms
[W4A] Contact Input 15 Events	Disabled
[W4C] Contact Input 16 ID	Cont Ip 16
[W4C] Contact Input 16 Debounce Time	2.0 ms
[W4C] Contact Input 16 Events	Disabled
[W5A] Contact Input 17 ID	AUTORI 79
[W5A] Contact Input 17 Debounce Time	2.0 ms
[W5A] Contact Input 17 Events	Disabled
[W5C] Contact Input 18 ID	Cont Ip 18
[W5C] Contact Input 18 Debounce Time	2.0 ms
[W5C] Contact Input 18 Events	Disabled
[W6A] Contact Input 19 ID	Cont Ip 19
[W6A] Contact Input 19 Debounce Time	2.0 ms
[W6A] Contact Input 19 Events	Disabled
[W6C] Contact Input 20 ID	Cont Ip 20
[W6C] Contact Input 20 Debounce Time	2.0 ms
[W6C] Contact Input 20 Events	Disabled
[W7A] Contact Input 21 ID	Cont Ip 21
[W7A] Contact Input 21 Debounce Time	2.0 ms
[W7A] Contact Input 21 Events	Disabled
[W7C] Contact Input 22 ID	Cont Ip 22
[W7C] Contact Input 22 Debounce Time	2.0 ms
[W7C] Contact Input 22 Events	Disabled
[W8A] Contact Input 23 ID	Cont Ip 23
[W8A] Contact Input 23 Debounce Time	2.0 ms
[W8A] Contact Input 23 Events	Disabled
[W8C] Contact Input 24 ID	Cont Ip 24
[W8C] Contact Input 24 Debounce Time	2.0 ms
[W8C] Contact Input 24 Events	Disabled

CONTACT INPUT THRESHOLDS

79 DESCO, 79 conectado, 63-FALLA PRE, 52A2 (a)(H7a, H7c, H8a, H8c)	33 Vdc
Cont Ip 5, Cont Ip 6, Cont Ip 7, Cont Ip 8(U7a, U7c, U8a, U8c)	33 Vdc
RECEP JAHUEL, RECEP ITAHUE, 52B P. CORTE, 52AP.CORTE(W1a, W1c, W	33 Vdcc)
CIERRE MANUA, TELE DESCONE, ITE AC FALLA, Cont Ip 16(W3a, W3c, W4	33 Vdc)
AUTORI 79, Cont Ip 18, Cont Ip 19, Cont Ip 20(W5a, W5c, W6a, W6c)	33 Vdc
Cont Ip 21, Cont Ip 22, Cont Ip 23, Cont Ip 24(W7a, W7c, W8a, W8c)	33 Vdc

CONTACT OUTPUTS

[H1] Contact Output 1 ID	TRIP FASE A
[H1] Contact Output 1 Operate	TRIP 3-POLE
[H1] Contact Output 1 Seal-In	OFF
[H1] Contact Output 1 Events	Enabled
[H2] Contact Output 2 ID	TRIP FASE B
[H2] Contact Output 2 Operate	TRIP 3-POLE
[H2] Contact Output 2 Seal-In	OFF
[H2] Contact Output 2 Events	Enabled
[H3] Contact Output 3 ID	TRIP FASE C
[H3] Contact Output 3 Operate	TRIP 3-POLE
[H3] Contact Output 3 Seal-In	OFF
[H3] Contact Output 3 Events	Enabled
[H4] Contact Output 4 ID	RETRIP A
[H4] Contact Output 4 Operate	BKR FAIL 1 RETRIP
[H4] Contact Output 4 Seal-In	OFF
[H4] Contact Output 4 Events	Enabled
[H5] Contact Output 5 ID	RETRIP B
[H5] Contact Output 5 Operate	BKR FAIL 1 RETRIP
[H5] Contact Output 5 Seal-In	OFF

RANCAGUA_LIAAJAH1_A2_S2_140527.URS
Y:\CRAP\ARCHIVOS DE CONFIGURACIÝN\04_OCS\RANCAGUA
DEVICE DEFINITION
FILES
ORDER CODE: D60-G00-HCL-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

CONTACT OUTPUTS (continued from last page)

[H5] Contact Output 5 Events	Enabled
[H6] Contact Output 6 ID	RETRIP C
[H6] Contact Output 6 Operate	BKR FAIL 1 RETRIP
[H6] Contact Output 6 Seal-In	OFF
[H6] Contact Output 6 Events	Enabled
[M1] Contact Output 7 ID	Alarma trip
[M1] Contact Output 7 Operate	Alarma trip On (VO10)
[M1] Contact Output 7 Seal-In	OFF
[M1] Contact Output 7 Events	Enabled
[M2] Contact Output 8 ID	FALLA RELE
[M2] Contact Output 8 Operate	Alarma f. re On (VO7)
[M2] Contact Output 8 Seal-In	OFF
[M2] Contact Output 8 Events	Enabled
[M4] Contact Output 10 ID	PARAR CAJA
[M4] Contact Output 10 Operate	TRIP 3-POLE
[M4] Contact Output 10 Seal-In	OFF
[M4] Contact Output 10 Events	Enabled
[P1] Contact Output 15 ID	79 cierre
[P1] Contact Output 15 Operate	ORD. CIERRE On (VO6)
[P1] Contact Output 15 Seal-In	OFF
[P1] Contact Output 15 Events	Enabled
[P2] Contact Output 16 ID	EMISION JAHU
[P2] Contact Output 16 Operate	TX MMOO On (VO12)
[P2] Contact Output 16 Seal-In	OFF
[P2] Contact Output 16 Events	Enabled
[P3] Contact Output 17 ID	EMISION ITAH
[P3] Contact Output 17 Operate	TX MMOO On (VO12)
[P3] Contact Output 17 Seal-In	OFF
[P3] Contact Output 17 Events	Enabled
[P4] Contact Output 18 ID	50BF-->barra
[P4] Contact Output 18 Operate	BKR FAIL 1 T1 OP
[P4] Contact Output 18 Seal-In	OFF
[P4] Contact Output 18 Events	Enabled
[P6] Contact Output 20 ID	Parada Caja
[P6] Contact Output 20 Operate	TRIP 3-POLE
[P6] Contact Output 20 Seal-In	OFF
[P6] Contact Output 20 Events	Disabled

VIRTUAL OUTPUTS

Virtual Output 1 ID	BLQ Zonas PH
Virtual Output 1 Events	Enabled
Virtual Output 2 ID	TRIP GRAL
Virtual Output 2 Events	Enabled
Virtual Output 3 ID	OSCILOGRAFIA
Virtual Output 3 Events	Enabled
Virtual Output 4 ID	pkp Z1o z2
Virtual Output 4 Events	Enabled
Virtual Output 6 ID	ORD. CIERRE
Virtual Output 6 Events	Enabled
Virtual Output 7 ID	Alarma f. re
Virtual Output 7 Events	Disabled
Virtual Output 8 ID	POWER SWING
Virtual Output 8 Events	Enabled
Virtual Output 10 ID	Alarma trip
Virtual Output 10 Events	Enabled
Virtual Output 11 ID	TX OPLAT
Virtual Output 11 Events	Enabled
Virtual Output 12 ID	TX MMOO
Virtual Output 12 Events	Disabled
Virtual Output 13 ID	LED Z1
Virtual Output 13 Events	Enabled
Virtual Output 14 ID	LED Z2
Virtual Output 14 Events	Enabled
Virtual Output 15 ID	LED Z3
Virtual Output 15 Events	Enabled
Virtual Output 16 ID	LED Z4
Virtual Output 16 Events	Enabled
Virtual Output 17 ID	79 on
Virtual Output 17 Events	Enabled

RANCAGUA_LIAAJAH1_A2_S2_140527.URS
Y:\CRAP\ARCHIVOS DE CONFIGURACIÝN\04_OCS\RANCAGUA
DEVICE DEFINITION
FILES
ORDER CODE: D60-G00-HCL-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

VIRTUAL OUTPUTS (continued from last page)

Virtual Output 18 ID	79 off
Virtual Output 18 Events	Enabled
Virtual Output 19 ID	reset led
Virtual Output 19 Events	Enabled
Virtual Output 22 ID	RECEP ACELER
Virtual Output 22 Events	Enabled
Virtual Output 23 ID	OPERA ZONA 1
Virtual Output 23 Events	Enabled
Virtual Output 24 ID	OPERA ZONA 2
Virtual Output 24 Events	Enabled
Virtual Output 25 ID	OPERA Z3/Z4
Virtual Output 25 Events	Enabled
Virtual Output 27 ID	67-67N
Virtual Output 27 Events	Enabled
Virtual Output 28 ID	51-51N
Virtual Output 28 Events	Enabled
Virtual Output 29 ID	50-50N
Virtual Output 29 Events	Enabled
Virtual Output 30 ID	Load encroch
Virtual Output 30 Events	Disabled
Virtual Output 31 ID	BLOQ 51
Virtual Output 31 Events	Enabled
Virtual Output 32 ID	REVERSE
Virtual Output 32 Events	Disabled
Virtual Output 33 ID	FORWARD
Virtual Output 33 Events	Disabled
Virtual Output 34 ID	BRK OPEN
Virtual Output 34 Events	Disabled
Virtual Output 35 ID	Z5 operada
Virtual Output 35 Events	Disabled
Virtual Output 36 ID	RECEP 3P
Virtual Output 36 Events	Enabled
Virtual Output 37 ID	ECHO 3P
Virtual Output 37 Events	Enabled
Virtual Output 38 ID	set grupo
Virtual Output 38 Events	Enabled
Virtual Output 39 ID	reset grupo
Virtual Output 39 Events	Enabled

RESETTING

Operand	reset led On (VO19)

CONTROL DE REVISIÓN DEL CRAP

REVISOR	FECHA	N° EAP	OBSERVACIONES
Max Missene M.	07-09-2015	Nº 75/2015	Cambio de ajustes para evitar que la Z1B actúe de forma instantánea en Sistema 2 protección Siemens 7SA61 .

Razón de TTCC/TTPP

TTCC: 600/5

TTPP: $\frac{161000}{\sqrt{3}}/115/\frac{115}{\sqrt{3}}$

Particularidades de Ajustes

- No hay.

Max / Centro Sur / Rancagua / A1 Rancagua Var

MLFB:	7SA61255AE217PR4
Versión del juego de parámetros:	V04.60.10
Ruta del equipo:	C:\Siemens\Digsi4\D4PROJ\Max\P7DI\GV\ST\00000051
Autor:	
Creado el:	23.10.15 11:03:02
Mod. por última vez el:	23.10.15 11:03:23
Modo de operación:	Sin línea
Comentario:	
Valores de ajuste en:	Presentación secundaria de los valores

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1 Device Configuration

Nº	Función	Volumen
0103	Setting Group Change Option	Enabled
0110	Trip mode	3pole only
0114	21 Distance protection pickup program	Z< (quadrilateral)
0120	68 Power Swing detection	Enabled
0121	85-21 Pilot Protection for Distance prot	POTT
0122	DTT Direct Transfer Trip	Disabled
0124	50HS Instantaneous SOTF	Enabled
0125	Weak Infeed (Trip and/or Echo)	Enabled
0126	50(N)/51(N) Backup OverCurrent	Time Overcurrent Curve IEC
0131	50N/51N Ground OverCurrent	Time Overcurrent Curve IEC
0132	85-67N Pilot Protection Gnd. OverCurrent	Disabled
0133	79 Auto-Reclose Function	Disabled
0134	Auto-Reclose control mode	with Trip and Action time
0135	25 Synchronism and Voltage Check	Disabled
0136	81 Over/Underfrequency Protection	Disabled
0137	27, 59 Under/Overvoltage Protection	Disabled
0138	Fault Locator	Enabled
0139	50BF Breaker Failure Protection	Enabled
0140	74TC Trip Circuit Supervision	Disabled
0142	49 Thermal Overload Protection	Disabled

2 Power System Data 1

2.1 Grupo Power System Data 1; Grupo Transformers

Grupo Power System Data 1; Grupo Transformers

Nº	Parámetro	Valor	Grupo
0201	CT Starpoint	towards Line	todo
0203	Rated Primary Voltage	161,0 kV	todo
0204	Rated Secondary Voltage (Ph-Ph)	115 V	todo
0205	CT Rated Primary Current	600 A	todo
0206	CT Rated Secondary Current	5A	todo
0210	V4 voltage transformer is	not connected	todo
0211	Matching ratio Phase-VT To Open-Delta-VT	1,73	todo
0215	Matching ratio Vsy1 / Vsy2	0,58	todo
0220	I4 current transformer is	Neutral Current (of the protected line)	todo
0221	Matching ratio I4/Iph for CT's	1,000	todo

2.2 Grupo Power System Data 1; Grupo Power System

Grupo Power System Data 1; Grupo Power System

Nº	Parámetro	Valor	Grupo
0207	System Starpoint is	Solid Grounded	todo
0230	Rated Frequency	50 Hz	todo
0235	Phase Sequence	A B C	todo
0236	Distance measurement unit	km	todo
0237	Setting format for zero seq.comp. format	Zero seq. comp. factor K0 and angle(K0)	todo

2.3 Grupo Power System Data 1; Grupo Breaker

Grupo Power System Data 1; Grupo Breaker

Nº	Parámetro	Valor	Grupo
0240A	Minimum TRIP Command Duration	0,12 sec	todo
0241A	Maximum Close Command Duration	0,25 sec	todo
0242	Dead Time for CB test-autoreclosure	0,10 sec	todo

3 Grupos de parámetros

3.1 Grupo Power System Data 2; Grupo Power System

Grupo Power System Data 2; Grupo Power System

Nº	Parámetro	Valor	Grupo
1103	Measurement: Full Scale Voltage (100%)	161,0 kV	A
1104	Measurement: Full Scale Current (100%)	600 A	A
1105	Line Angle	79 °	A
1211	Angle of inclination, distance charact.	79 °	A
1107	P,Q operational measured values sign	not reversed	A
1110	x' - Line Reactance per length unit	0,0359 Ohm / km	A
1111	Line Length	50,6 km	A
1120	Zero seq. comp. factor K0 for zone Z1	0,809	A
1121	Zero seq. comp. angle for zone Z1	3,02 °	A
1122	Zero seq.comp.factor K0,higher zones >Z1	0,809	A
1123	Zero seq. comp. angle, higher zones >Z1	3,02 °	A

3.2 Grupo Power System Data 2; Grupo Line Status

Grupo Power System Data 2; Grupo Line Status

Nº	Parámetro	Valor	Grupo
1130A	Pole Open Current Threshold	0,25 A	A
1131A	Pole Open Voltage Threshold	11 V	A
1132A	Seal-in Time after ALL closures	0,20 sec	A
1133A	minimal time for line open before SOTF	0,25 sec	A
1134	Recognition of Line Closures with	CBpos(52a) OR Current or Manual close BI	A
1135	RESET of Trip Command	with Pole Open Current Threshold only	A
1140A	CT Saturation Threshold	100,0 A	A
1150A	Seal-in Time after MANUAL closures	0,20 sec	A
1151	Manual CLOSE COMMAND generation	NO	A
1152	MANUAL Closure Impulse after CONTROL	<none>	todo

3.3 Grupo 21 Distance protection, general settings; Grupo General

Grupo 21 Distance protection, general settings; Grupo General

Nº	Parámetro	Valor	Grupo
1201	21 Distance protection is	ON	A
1202	Phase Current threshold for dist. meas.	0,25 A	A
1211	Angle of inclination, distance charact.	79 °	A
1208	Series compensated line	NO	A
1232	Instantaneous trip after SwitchOnToFault	with Zone Z1B	A
1241	R load, minimum Load Impedance (ph-g)	9,140 Ohm	A
1242	PHI load, maximum Load Angle (ph-g)	35 °	A
1243	R load, minimum Load Impedance (ph-ph)	9,140 Ohm	A
1244	PHI load, maximum Load Angle (ph-ph)	35 °	A
1357	Z1B enabled before 1st AR (int. or ext.)	NO	A

3.4 Grupo 21 Distance protection, general settings; Grupo Ground faults

Grupo 21 Distance protection, general settings; Grupo Ground faults

Nº	Parámetro	Valor	Grupo
1203	3I0 threshold for neutral current pickup	0,25 A	A
1204	3V0 threshold zero seq. voltage pickup	2 V	A
1207A	3I0>-pickup-stabilisation (3I0>/ Iphmax)	0,10	A
1209A	Criterion of ground fault recognition	3I0> OR 3V0>	A
1221A	Loop selection with 2Ph-G faults	all loops	A

3.5 Grupo 21 Distance protection, general settings; Grupo Time Delays

Grupo 21 Distance protection, general settings; Grupo Time Delays

Nº	Parámetro	Valor	Grupo
1210	21 Condition for zone timer start	with distance pickup	A
1305	T1-1phase, delay for single phase faults	0,00 sec	A
1306	T1multi-ph, delay for multi phase faults	0,00 sec	A
1315	T2-1phase, delay for single phase faults	0,60 sec	A
1316	T2multi-ph, delay for multi phase faults	0,60 sec	A
1325	T3 delay	2,50 sec	A
1335	T4 delay	1,50 sec	A
1345	T5 delay	oo sec	A
1355	T1B-1phase, delay for single ph. faults	0,00 sec	A
1356	T1B-multi-ph, delay for multi ph. faults	0,00 sec	A

3.6 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1

Nº	Parámetro	Valor	Grupo
1301	Operating mode Z1	Forward	A
1302	R(Z1), Resistance for ph-ph-faults	2,740 Ohm	A
1303	X(Z1), Reactance	2,740 Ohm	A
1304	RG(Z1), Resistance for ph-gnd faults	2,740 Ohm	A
1305	T1-1phase, delay for single phase faults	0,00 sec	A
1306	T1multi-ph, delay for multi phase faults	0,00 sec	A
1307	Zone Reduction Angle (load compensation)	0 °	A

3.7 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1B-exten.

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1B-exten.

Nº	Parámetro	Valor	Grupo
1351	Operating mode Z1B (overrreach zone)	Forward	A
1352	R(Z1B), Resistance for ph-ph-faults	21,000 Ohm	A
1353	X(Z1B), Reactance	25,689 Ohm	A
1354	RG(Z1B), Resistance for ph-gnd faults	21,000 Ohm	A
1355	T1B-1phase, delay for single ph. faults	0,00 sec	A
1356	T1B-multi-ph, delay for multi ph. faults	0,00 sec	A
1357	Z1B enabled before 1st AR (int. or ext.)	NO	A

3.8 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z2

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z2

Nº	Parámetro	Valor	Grupo
1311	Operating mode Z2	Forward	A
1312	R(Z2), Resistance for ph-ph-faults	5,520 Ohm	A
1313	X(Z2), Reactance	5,520 Ohm	A
1314	RG(Z2), Resistance for ph-gnd faults	5,520 Ohm	A
1315	T2-1phase, delay for single phase faults	0,60 sec	A
1316	T2multi-ph, delay for multi phase faults	0,60 sec	A

3.9 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z3

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z3

Nº	Parámetro	Valor	Grupo
1321	Operating mode Z3	Reverse	A
1322	R(Z3), Resistance for ph-ph-faults	12,500 Ohm	A
1323	X(Z3), Reactance	12,500 Ohm	A
1324	RG(Z3), Resistance for ph-gnd faults	12,500 Ohm	A
1325	T3 delay	2,50 sec	A

3.10 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z4

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z4

Nº	Parámetro	Valor	Grupo
1331	Operating mode Z4	Forward	A
1332	R(Z4), Resistance for ph-ph-faults	13,000 Ohm	A
1333	X(Z4), Reactance	13,000 Ohm	A
1334	RG(Z4), Resistance for ph-gnd faults	13,000 Ohm	A
1335	T4 delay	1,50 sec	A

3.11 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z5

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z5

Nº	Parámetro	Valor	Grupo
1341	Operating mode Z5	Non-Directional	A
1342	R(Z5), Resistance for ph-ph-faults	14,000 Ohm	A
1343	X(Z5)+, Reactance for Forward direction	14,000 Ohm	A
1344	RG(Z5), Resistance for ph-gnd faults	14,000 Ohm	A
1345	T5 delay	oo sec	A
1346	X(Z5)-, Reactance for Reverse direction	13,500 Ohm	A

3.12 Grupo 68 Power Swing detection

Grupo 68 Power Swing detection

Nº	Parámetro	Valor	Grupo
2002	Power Swing Operating mode	all zones blocked	A
2006	68T Power swing trip	NO	A
2007	68 Trip delay after Power Swing Blocking	0,08 sec	A

3.13 Grupo 85-21 Pilot Prot. for Distance prot.

Grupo 85-21 Pilot Prot. for Distance prot.

Nº	Parámetro	Valor	Grupo
2101	85-21 Pilot Prot. for Distance prot.	ON	A
2102	Type of Line	Three Terminals	A
2103A	Time for send signal prolongation	0,10 sec	A
2109A	Transient Block.: Duration external flt.	0,03 sec	A
2110A	Transient Block.: Blk.T. after ext. flt.	0,17 sec	A

3.14 Grupo 50HS Instantaneous SOTF

Grupo 50HS Instantaneous SOTF

Nº	Parámetro	Valor	Grupo
2401	50HS Instantaneous SOTF-O/C is	ON	A

Grupo 50HS Instantaneous SOTF(2)

Nº	Parámetro	Valor	Grupo
2404	50HS SOTF-O/C PICKUP	6,67 A	A

3.15 Grupo Weak Infeed (Trip and/or Echo)

Grupo Weak Infeed (Trip and/or Echo)

Nº	Parámetro	Valor	Grupo
2501	Weak Infeed option	Echo only	A
2502A	Trip / Echo Delay after carrier receipt	0,04 sec	A
2503A	Trip Extension / Echo Impulse time	0,10 sec	A
2504A	Echo Block Time	0,50 sec	A
2505	Undervoltage (ph-g)	25 V	A
2509	Echo logic: 21 and 67N on common channel	NO	todo

3.16 Grupo 50(N)/51(N) Backup OverCurrent; Grupo General

Grupo 50(N)/51(N) Backup OverCurrent; Grupo General

Nº	Parámetro	Valor	Grupo
2601	Operating mode	ON:only active with Loss of VT sec. cir.	A
2680	Trip time delay after SOTF	0,00 sec	A

3.17 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B1

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B1

Nº	Parámetro	Valor	Grupo
2610	50-B1 Pickup	oo A	A
2611	50-B1 Delay	oo sec	A
2612	50N-B1 Pickup	oo A	A
2613	50N-B1 Delay	oo sec	A
2614	Instantaneous trip via BI	NO	A
2615	Instantaneous trip after SwitchOnToFault	NO	A

3.18 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B2

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B2

Nº	Parámetro	Valor	Grupo
2620	50-B2 Pickup	oo A	A
2621	50-B2 Delay	oo sec	A
2622	50N-B2 Pickup	oo A	A
2623	50N-B2 Delay	oo sec	A
2624	Instantaneous trip via Pilot Prot./BI	NO	A
2625	Instantaneous trip after SwitchOnToFault	NO	A

3.19 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 51(N)-B

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 51(N)-B

Nº	Parámetro	Valor	Grupo
2640	51-B Pickup	6,00 A	A
2642	51-B Time Dial	0,15 sec	A
2646	51-B Additional Time Delay	0,00 sec	A
2650	51N-B Pickup	0,25 A	A
2652	51N-B Time Dial	0,40 sec	A
2656	51N-B Additional Time Delay	0,00 sec	A
2660	IEC Curve	Normal Inverse	A
2670	Instantaneous trip via Pilot Prot./BI	NO	A
2671	Instantaneous trip after SwitchOnToFault	NO	A

3.20 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-STUB

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-STUB

Nº	Parámetro	Valor	Grupo
2630	50-STUB Pickup	oo A	A
2631	50-STUB Delay	oo sec	A
2632	50N-STUB Pickup	oo A	A
2633	50N-STUB Delay	oo sec	A
2634	Instantaneous trip via Pilot Prot./BI	NO	A
2635	Instantaneous trip after SwitchOnToFault	NO	A

3.21 Grupo Measurement Supervision; Grupo Balance / Summ.

Grupo Measurement Supervision; Grupo Balance / Summ.

Nº	Parámetro	Valor	Grupo
2901	Measurement Supervision	ON	A
2902A	Voltage Threshold for Balance Monitoring	50 V	A
2903A	Balance Factor for Voltage Monitor	0,75	A
2904A	Current Threshold for Balance Monitoring	0,50 A	A
2905A	Balance Factor for Current Monitor	0,50	A
2906A	Summated Current Monitoring Threshold	0,50 A	A
2907A	Summated Current Monitoring Factor	0,10	A
2908A	T Balance Factor for Voltage Monitor	5 sec	A
2909A	T Current Balance Monitor	5 sec	A

3.22 Grupo Measurement Supervision; Grupo Meas.Volt.Fail

Grupo Measurement Supervision; Grupo Meas.Volt.Fail

Nº	Parámetro	Valor	Grupo
2910	Fuse Failure Monitor	ON	A
2911A	Minimum Voltage Threshold V>	30 V	A
2912A	Maximum Current Threshold I<	0,50 A	A
2913A	Maximum Voltage Threshold V< (3phase)	5 V	A
2914A	Differential Current Threshold (3phase)	0,50 A	A
2915	Voltage Failure Supervision	with current superv. and CBpos(52a)	A
2916A	Delay Voltage Failure Supervision	3,00 sec	A

3.23 Grupo Measurement Supervision; Grupo VT mcb

Grupo Measurement Supervision; Grupo VT mcb

Nº	Parámetro	Valor	Grupo
2921	VT mcb operating time	5 ms	A

3.24 Grupo Measurement Supervision; Grupo Load Angle

Grupo Measurement Supervision; Grupo Load Angle

Nº	Parámetro	Valor	Grupo
2941	Limit setting PhiA	200 °	A
2942	Limit setting PhiB	340 °	A
2943	Minimum value I1>	0,25 A	A
2944	Minimum value U1>	20 V	A

3.25 Grupo 50N/51N Ground OverCurrent; Grupo General

Grupo 50N/51N Ground OverCurrent; Grupo General

Nº	Parámetro	Valor	Grupo
3101	50N/51N Ground Overcurrent	ON	A
3102	Block 50N/51N for Distance protection	NO	A
3174	Block 50N/51N for Pickup 21	in each zone	A
3104A	Stabilisation Slope with Iphase	10 %	A
3170	2nd harmonic ratio for inrush restraint	20 %	A
3171	Max.Current, overriding inrush restraint	37,50 A	A
3172	Instantaneous mode after SwitchOnToFault	with Pickup and direction	A
3173	Trip time delay after SOTF	0,00 sec	A

3.26 Grupo 50N/51N Ground OverCurrent; Grupo 50N-1

Grupo 50N/51N Ground OverCurrent; Grupo 50N-1

Nº	Parámetro	Valor	Grupo
3110	Operating mode	Inactive	A
3111	Pickup	9,50 A	A
3112	Time Delay	0,30 sec	A
3113	Instantaneous trip via Pilot Prot./BI	NO	A
3114	Instantaneous trip after SwitchOnToFault	NO	A
3115	Inrush Blocking	NO	A

3.27 Grupo 50N/51N Ground OverCurrent; Grupo 50N-2

Grupo 50N/51N Ground OverCurrent; Grupo 50N-2

Nº	Parámetro	Valor	Grupo
3120	Operating mode	Inactive	A
3121	Pickup	0,83 A	A
3122	Time Delay	0,60 sec	A
3123	Instantaneous trip via Pilot Prot./BI	NO	A
3124	Instantaneous trip after SwitchOnToFault	NO	A
3125	Inrush Blocking	NO	A

3.28 Grupo 50N/51N Ground OverCurrent; Grupo 50N-3

Grupo 50N/51N Ground OverCurrent; Grupo 50N-3

Nº	Parámetro	Valor	Grupo
3130	Operating mode	Inactive	A
3131	Pickup	0,83 A	A
3132	Time Delay	0,90 sec	A
3133	Instantaneous trip via Pilot Prot./BI	NO	A
3134	Instantaneous trip after SwitchOnToFault	NO	A
3135	Inrush Blocking	NO	A

3.29 Grupo 50N/51N Ground OverCurrent; Grupo 51N InverseTime

Grupo 50N/51N Ground OverCurrent; Grupo 51N InverseTime

Nº	Parámetro	Valor	Grupo
3140	Operating mode	Forward	A
3141	Pickup	0,25 A	A
3143	Time Dial	0,40 sec	A
3147	Additional Time Delay	0,00 sec	A
3148	Instantaneous trip via Pilot Prot./BI	NO	A
3149	Instantaneous trip after SwitchOnToFault	NO	A
3150	Inrush Blocking	NO	A
3151	IEC Curve	Normal Inverse	A

3.30 Grupo 50N/51N Ground OverCurrent; Grupo Direction

Grupo 50N/51N Ground OverCurrent; Grupo Direction

Nº	Parámetro	Valor	Grupo
3160	Polarization	with Vo + Ig or V2	A
3162A	ALPHA, lower angle for forward direction	338 °	A
3163A	BETA, upper angle for forward direction	122 °	A
3164	Min. zero seq.voltage 3Vo for polarizing	3,0 V	A
3166	Min. neg. seq. polarizing voltage 3V2	3,0 V	A
3167	Min. neg. seq. polarizing current 3I2	0,25 A	A
3168	Compensation angle PHI comp. for Sr	255 °	A
3169	Forward direction power threshold	1,5 VA	A

3.31 Grupo Fault Locator

Grupo Fault Locator

Nº	Parámetro	Valor	Grupo
3802	Start fault locator with	TRIP	A
3806	Load Compensation	NO	A

3.32 Grupo 50BF Breaker Failure; Grupo 50BF

Grupo 50BF Breaker Failure; Grupo 50BF

Nº	Parámetro	Valor	Grupo
3901	50BF Breaker Failure Protection	ON	A
3902	50BF Pickup current threshold	2,08 A	A
3904	Delay after 1pole start for local trip	0,01 sec	A
3905	Delay after 3pole start for local trip	0,01 sec	A
3906	Delay of 2nd element for busbar trip	0,20 sec	A
3907	Delay for start with defective bkr.	0,00 sec	A
3908	Trip output selection with defective bkr	NO	A
3909	Check Breaker contacts	YES	A

3.33 Grupo 50BF Breaker Failure; Grupo End fault prot.

Grupo 50BF Breaker Failure; Grupo End fault prot.

Nº	Parámetro	Valor	Grupo
3921	End fault element	OFF	A
3922	Trip delay of end fault element	2,00 sec	A

3.34 Grupo 50BF Breaker Failure; Grupo PoleDiscrepancy

Grupo 50BF Breaker Failure; Grupo PoleDiscrepancy

Nº	Parámetro	Valor	Grupo
3931	Pole Discrepancy supervision	OFF	A
3932	Trip delay with pole discrepancy	2,00 sec	A

3.35 Grupo Power System Data 2; Grupo Power System

Grupo Power System Data 2; Grupo Power System

Nº	Parámetro	Valor	Grupo
1103	Measurement: Full Scale Voltage (100%)	161,0 kV	B
1104	Measurement: Full Scale Current (100%)	600 A	B
1105	Line Angle	79 °	B
1211	Angle of inclination, distance charact.	79 °	B
1107	P,Q operational measured values sign	not reversed	B
1110	x' - Line Reactance per length unit	0,0362 Ohm / km	B
1111	Line Length	60,6 km	B
1120	Zero seq. comp. factor K0 for zone Z1	1,000	B
1121	Zero seq. comp. angle for zone Z1	0,00 °	B
1122	Zero seq.comp.factor K0,higher zones >Z1	1,000	B
1123	Zero seq. comp. angle, higher zones >Z1	0,00 °	B

3.36 Grupo Power System Data 2; Grupo Line Status

Grupo Power System Data 2; Grupo Line Status

Nº	Parámetro	Valor	Grupo
1130A	Pole Open Current Threshold	0,25 A	B
1131A	Pole Open Voltage Threshold	11 V	B
1132A	Seal-in Time after ALL closures	0,20 sec	B
1133A	minimal time for line open before SOTF	0,25 sec	B
1134	Recognition of Line Closures with	CBpos(52a) OR Current or Manual close BI	B
1135	RESET of Trip Command	with Pole Open Current Threshold only	B
1140A	CT Saturation Threshold	oo A	B
1150A	Seal-in Time after MANUAL closures	0,20 sec	B
1151	Manual CLOSE COMMAND generation	NO	B
1152	MANUAL Closure Impulse after CONTROL	<none>	todo

3.37 Grupo 21 Distance protection, general settings; Grupo General

Grupo 21 Distance protection, general settings; Grupo General

Nº	Parámetro	Valor	Grupo
1201	21 Distance protection is	ON	B
1202	Phase Current threshold for dist. meas.	0,50 A	B
1211	Angle of inclination, distance charact.	79 °	B
1208	Series compensated line	NO	B
1232	Instantaneous trip after SwitchOnToFault	with Zone Z1B	B
1241	R load, minimum Load Impedance (ph-g)	oo Ohm	B
1242	PHI load, maximum Load Angle (ph-g)	30 °	B
1243	R load, minimum Load Impedance (ph-ph)	oo Ohm	B
1244	PHI load, maximum Load Angle (ph-ph)	30 °	B
1357	Z1B enabled before 1st AR (int. or ext.)	YES	B

3.38 Grupo 21 Distance protection, general settings; Grupo Ground faults

Grupo 21 Distance protection, general settings; Grupo Ground faults

Nº	Parámetro	Valor	Grupo
1203	3I0 threshold for neutral current pickup	0,25 A	B
1204	3V0 threshold zero seq. voltage pickup	oo V	B
1207A	3I0>-pickup-stabilisation (3I0>/ Iphmax)	0,10	B
1209A	Criterion of ground fault recognition	3I0> OR 3V0>	B
1221A	Loop selection with 2Ph-G faults	all loops	B

3.39 Grupo 21 Distance protection, general settings; Grupo Time Delays

Grupo 21 Distance protection, general settings; Grupo Time Delays

Nº	Parámetro	Valor	Grupo
1210	21 Condition for zone timer start	with distance pickup	B
1305	T1-1phase, delay for single phase faults	0,00 sec	B
1306	T1multi-ph, delay for multi phase faults	0,00 sec	B
1315	T2-1phase, delay for single phase faults	0,40 sec	B
1316	T2multi-ph, delay for multi phase faults	0,40 sec	B
1325	T3 delay	2,00 sec	B
1335	T4 delay	2,00 sec	B
1345	T5 delay	oo sec	B
1355	T1B-1phase, delay for single ph. faults	0,00 sec	B
1356	T1B-multi-ph, delay for multi ph. faults	0,00 sec	B

3.40 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1

Nº	Parámetro	Valor	Grupo
1301	Operating mode Z1	Forward	B
1302	R(Z1), Resistance for ph-ph-faults	1,720 Ohm	B
1303	X(Z1), Reactance	1,720 Ohm	B
1304	RG(Z1), Resistance for ph-gnd faults	3,440 Ohm	B
1305	T1-1phase, delay for single phase faults	0,00 sec	B
1306	T1multi-ph, delay for multi phase faults	0,00 sec	B
1307	Zone Reduction Angle (load compensation)	0 °	B

3.41 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1B-exten.

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1B-exten.

Nº	Parámetro	Valor	Grupo
1351	Operating mode Z1B (overrreach zone)	Forward	B
1352	R(Z1B), Resistance for ph-ph-faults	2,900 Ohm	B
1353	X(Z1B), Reactance	2,900 Ohm	B
1354	RG(Z1B), Resistance for ph-gnd faults	5,800 Ohm	B
1355	T1B-1phase, delay for single ph. faults	0,00 sec	B
1356	T1B-multi-ph, delay for multi ph. faults	0,00 sec	B
1357	Z1B enabled before 1st AR (int. or ext.)	YES	B

3.42 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z2

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z2

Nº	Parámetro	Valor	Grupo
1311	Operating mode Z2	Forward	B
1312	R(Z2), Resistance for ph-ph-faults	2,900 Ohm	B
1313	X(Z2), Reactance	2,900 Ohm	B
1314	RG(Z2), Resistance for ph-gnd faults	5,800 Ohm	B
1315	T2-1phase, delay for single phase faults	0,40 sec	B
1316	T2multi-ph, delay for multi phase faults	0,40 sec	B

3.43 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z3

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z3

Nº	Parámetro	Valor	Grupo
1321	Operating mode Z3	Reverse	B
1322	R(Z3), Resistance for ph-ph-faults	2,000 Ohm	B
1323	X(Z3), Reactance	2,000 Ohm	B
1324	RG(Z3), Resistance for ph-gnd faults	4,000 Ohm	B
1325	T3 delay	2,00 sec	B

3.44 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z4

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z4

Nº	Parámetro	Valor	Grupo
1331	Operating mode Z4	Forward	B
1332	R(Z4), Resistance for ph-ph-faults	5,500 Ohm	B
1333	X(Z4), Reactance	5,500 Ohm	B
1334	RG(Z4), Resistance for ph-gnd faults	11,000 Ohm	B
1335	T4 delay	2,00 sec	B

3.45 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z5

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z5

Nº	Parámetro	Valor	Grupo
1341	Operating mode Z5	Non-Directional	B
1342	R(Z5), Resistance for ph-ph-faults	5,520 Ohm	B
1343	X(Z5)+, Reactance for Forward direction	5,520 Ohm	B
1344	RG(Z5), Resistance for ph-gnd faults	11,200 Ohm	B
1345	T5 delay	oo sec	B
1346	X(Z5)-, Reactance for Reverse direction	4,000 Ohm	B

3.46 Grupo 68 Power Swing detection

Grupo 68 Power Swing detection

Nº	Parámetro	Valor	Grupo
2002	Power Swing Operating mode	all zones blocked	B
2006	68T Power swing trip	NO	B
2007	68 Trip delay after Power Swing Blocking	0,08 sec	B

3.47 Grupo 85-21 Pilot Prot. for Distance prot.

Grupo 85-21 Pilot Prot. for Distance prot.

Nº	Parámetro	Valor	Grupo
2101	85-21 Pilot Prot. for Distance prot.	ON	B
2102	Type of Line	Two Terminals	B
2103A	Time for send signal prolongation	0,10 sec	B
2109A	Transient Block.: Duration external flt.	0,04 sec	B
2110A	Transient Block.: Blk.T. after ext. flt.	0,20 sec	B

3.48 Grupo 50HS Instantaneous SOTF

Grupo 50HS Instantaneous SOTF

Nº	Parámetro	Valor	Grupo
2401	50HS Instantaneous SOTF-O/C is	ON	B
2404	50HS SOTF-O/C PICKUP	12,50 A	B

3.49 Grupo Weak Infeed (Trip and/or Echo)

Grupo Weak Infeed (Trip and/or Echo)

Nº	Parámetro	Valor	Grupo
2501	Weak Infeed option	Echo only	B
2502A	Trip / Echo Delay after carrier receipt	0,04 sec	B
2503A	Trip Extension / Echo Impulse time	0,10 sec	B
2504A	Echo Block Time	0,50 sec	B
2505	Undervoltage (ph-g)	25 V	B
2509	Echo logic: 21 and 67N on common channel	NO	todo

3.50 Grupo 50(N)/51(N) Backup OverCurrent; Grupo General

Grupo 50(N)/51(N) Backup OverCurrent; Grupo General

Nº	Parámetro	Valor	Grupo
2601	Operating mode	ON:only active with Loss of VT sec. cir.	B
2680	Trip time delay after SOTF	0,00 sec	B

3.51 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B1

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B1

Nº	Parámetro	Valor	Grupo
2610	50-B1 Pickup	9,00 A	B
2611	50-B1 Delay	0,10 sec	B
2612	50N-B1 Pickup	9,00 A	B
2613	50N-B1 Delay	0,02 sec	B
2614	Instantaneous trip via BI	NO	B
2615	Instantaneous trip after SwitchOnToFault	NO	B

3.52 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B2

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B2

Nº	Parámetro	Valor	Grupo
2620	50-B2 Pickup	oo A	B
2621	50-B2 Delay	oo sec	B
2622	50N-B2 Pickup	oo A	B
2623	50N-B2 Delay	oo sec	B
2624	Instantaneous trip via Pilot Prot./BI	NO	B
2625	Instantaneous trip after SwitchOnToFault	NO	B

3.53 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 51(N)-B

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 51(N)-B

Nº	Parámetro	Valor	Grupo
2640	51-B Pickup	3,46 A	B
2642	51-B Time Dial	0,15 sec	B
2646	51-B Additional Time Delay	0,00 sec	B
2650	51N-B Pickup	1,40 A	B
2652	51N-B Time Dial	0,13 sec	B
2656	51N-B Additional Time Delay	0,00 sec	B
2660	IEC Curve	Normal Inverse	B
2670	Instantaneous trip via Pilot Prot./BI	NO	B

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 51(N)-B(2)

Nº	Parámetro	Valor	Grupo
2671	Instantaneous trip after SwitchOnToFault	NO	B

3.54 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-STUB

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-STUB

Nº	Parámetro	Valor	Grupo
2630	50-STUB Pickup	oo A	B
2631	50-STUB Delay	0,30 sec	B
2632	50N-STUB Pickup	oo A	B
2633	50N-STUB Delay	2,00 sec	B
2634	Instantaneous trip via Pilot Prot./BI	NO	B
2635	Instantaneous trip after SwitchOnToFault	NO	B

3.55 Grupo Measurement Supervision; Grupo Balance / Summ.

Grupo Measurement Supervision; Grupo Balance / Summ.

Nº	Parámetro	Valor	Grupo
2901	Measurement Supervision	ON	B
2902A	Voltage Threshold for Balance Monitoring	50 V	B
2903A	Balance Factor for Voltage Monitor	0,75	B
2904A	Current Threshold for Balance Monitoring	0,50 A	B
2905A	Balance Factor for Current Monitor	0,50	B
2906A	Summated Current Monitoring Threshold	0,50 A	B
2907A	Summated Current Monitoring Factor	0,10	B
2908A	T Balance Factor for Voltage Monitor	5 sec	B
2909A	T Current Balance Monitor	5 sec	B

3.56 Grupo Measurement Supervision; Grupo Meas.Volt.Fail

Grupo Measurement Supervision; Grupo Meas.Volt.Fail

Nº	Parámetro	Valor	Grupo
2910	Fuse Failure Monitor	ON	B
2911A	Minimum Voltage Threshold V>	30 V	B
2912A	Maximum Current Threshold I<	0,50 A	B
2913A	Maximum Voltage Threshold V< (3phase)	5 V	B
2914A	Differential Current Threshold (3phase)	0,50 A	B
2915	Voltage Failure Supervision	with current superv. and CBpos(52a)	B
2916A	Delay Voltage Failure Supervision	3,00 sec	B

3.57 Grupo Measurement Supervision; Grupo VT mcb

Grupo Measurement Supervision; Grupo VT mcb

Nº	Parámetro	Valor	Grupo
2921	VT mcb operating time	5 ms	B

3.58 Grupo Measurement Supervision; Grupo Load Angle

Grupo Measurement Supervision; Grupo Load Angle

Nº	Parámetro	Valor	Grupo
2941	Limit setting PhiA	200 °	B
2942	Limit setting PhiB	340 °	B
2943	Minimum value I1>	0,25 A	B
2944	Minimum value U1>	20 V	B

3.59 Grupo 50N/51N Ground OverCurrent; Grupo General

Grupo 50N/51N Ground OverCurrent; Grupo General

Nº	Parámetro	Valor	Grupo
3101	50N/51N Ground Overcurrent	ON	B
3102	Block 50N/51N for Distance protection	NO	B
3174	Block 50N/51N for Pickup 21	in each zone	B
3104A	Stabilisation Slope with Iphase	10 %	B
3170	2nd harmonic ratio for inrush restraint	15 %	B
3171	Max.Current, overriding inrush restraint	37,50 A	B
3172	Instantaneous mode after SwitchOnToFault	with Pickup and direction	B
3173	Trip time delay after SOTF	0,00 sec	B

3.60 Grupo 50N/51N Ground OverCurrent; Grupo 50N-1

Grupo 50N/51N Ground OverCurrent; Grupo 50N-1

Nº	Parámetro	Valor	Grupo
3110	Operating mode	Forward	B
3111	Pickup	9,00 A	B
3112	Time Delay	0,03 sec	B
3113	Instantaneous trip via Pilot Prot./BI	NO	B
3114	Instantaneous trip after SwitchOnToFault	NO	B
3115	Inrush Blocking	NO	B

3.61 Grupo 50N/51N Ground OverCurrent; Grupo 50N-2

Grupo 50N/51N Ground OverCurrent; Grupo 50N-2

Nº	Parámetro	Valor	Grupo
3120	Operating mode	Inactive	B
3121	Pickup	2,00 A	B
3122	Time Delay	0,60 sec	B
3123	Instantaneous trip via Pilot Prot./BI	NO	B
3124	Instantaneous trip after SwitchOnToFault	NO	B
3125	Inrush Blocking	NO	B

3.62 Grupo 50N/51N Ground OverCurrent; Grupo 50N-3

Grupo 50N/51N Ground OverCurrent; Grupo 50N-3

Nº	Parámetro	Valor	Grupo
3130	Operating mode	Inactive	B
3131	Pickup	1,00 A	B
3132	Time Delay	0,90 sec	B
3133	Instantaneous trip via Pilot Prot./BI	NO	B
3134	Instantaneous trip after SwitchOnToFault	NO	B
3135	Inrush Blocking	NO	B

3.63 Grupo 50N/51N Ground OverCurrent; Grupo 51N InverseTime

Grupo 50N/51N Ground OverCurrent; Grupo 51N InverseTime

Nº	Parámetro	Valor	Grupo
3140	Operating mode	Forward	B
3141	Pickup	1,40 A	B
3143	Time Dial	0,14 sec	B
3147	Additional Time Delay	0,00 sec	B
3148	Instantaneous trip via Pilot Prot./BI	NO	B
3149	Instantaneous trip after SwitchOnToFault	NO	B
3150	Inrush Blocking	NO	B
3151	IEC Curve	Normal Inverse	B

3.64 Grupo 50N/51N Ground OverCurrent; Grupo Direction

Grupo 50N/51N Ground OverCurrent; Grupo Direction

Nº	Parámetro	Valor	Grupo
3160	Polarization	with Vo + Ig or V2	B
3162A	ALPHA, lower angle for forward direction	338 °	B
3163A	BETA, upper angle for forward direction	122 °	B
3164	Min. zero seq.voltage 3Vo for polarizing	3,0 V	B
3166	Min. neg. seq. polarizing voltage 3V2	3,0 V	B
3167	Min. neg. seq. polarizing current 3I2	0,25 A	B
3168	Compensation angle PHI comp. for Sr	255 °	B
3169	Forward direction power threshold	1,5 VA	B

3.65 Grupo Fault Locator

Grupo Fault Locator

Nº	Parámetro	Valor	Grupo
3802	Start fault locator with	TRIP	B
3806	Load Compensation	NO	B

3.66 Grupo 50BF Breaker Failure; Grupo 50BF

Grupo 50BF Breaker Failure; Grupo 50BF

Nº	Parámetro	Valor	Grupo
3901	50BF Breaker Failure Protection	ON	B
3902	50BF Pickup current threshold	6,00 A	B
3904	Delay after 1pole start for local trip	0,02 sec	B
3905	Delay after 3pole start for local trip	0,02 sec	B
3906	Delay of 2nd element for busbar trip	0,20 sec	B
3907	Delay for start with defective bkr.	0,00 sec	B
3908	Trip output selection with defective bkr	NO	B
3909	Check Breaker contacts	YES	B

3.67 Grupo 50BF Breaker Failure; Grupo End fault prot.

Grupo 50BF Breaker Failure; Grupo End fault prot.

Nº	Parámetro	Valor	Grupo
3921	End fault element	OFF	B
3922	Trip delay of end fault element	2,00 sec	B

3.68 Grupo 50BF Breaker Failure; Grupo PoleDiscrepancy

Grupo 50BF Breaker Failure; Grupo PoleDiscrepancy

Nº	Parámetro	Valor	Grupo
3931	Pole Discrepancy supervision	OFF	B

Grupo 50BF Breaker Failure; Grupo PoleDiscrepancy(2)

Nº	Parámetro	Valor	Grupo
3932	Trip delay with pole discrepancy	2,00 sec	B

3.69 Grupo Power System Data 2; Grupo Power System

Grupo Power System Data 2; Grupo Power System

Nº	Parámetro	Valor	Grupo
1103	Measurement: Full Scale Voltage (100%)	161,0 kV	C
1104	Measurement: Full Scale Current (100%)	600 A	C
1105	Line Angle	79 °	C
1211	Angle of inclination, distance charact.	79 °	C
1107	P,Q operational measured values sign	not reversed	C
1110	x' - Line Reactance per length unit	0,0362 Ohm / km	C
1111	Line Length	60,6 km	C
1120	Zero seq. comp. factor K0 for zone Z1	1,000	C
1121	Zero seq. comp. angle for zone Z1	0,00 °	C
1122	Zero seq.comp.factor K0,higher zones >Z1	1,000	C
1123	Zero seq. comp. angle, higher zones >Z1	0,00 °	C

3.70 Grupo Power System Data 2; Grupo Line Status

Grupo Power System Data 2; Grupo Line Status

Nº	Parámetro	Valor	Grupo
1130A	Pole Open Current Threshold	0,25 A	C
1131A	Pole Open Voltage Threshold	11 V	C
1132A	Seal-in Time after ALL closures	0,20 sec	C
1133A	minimal time for line open before SOTF	0,25 sec	C
1134	Recognition of Line Closures with	CBpos(52a) OR Current or Manual close BI	C
1135	RESET of Trip Command	with Pole Open Current Threshold only	C
1140A	CT Saturation Threshold	oo A	C
1150A	Seal-in Time after MANUAL closures	0,20 sec	C
1151	Manual CLOSE COMMAND generation	NO	C
1152	MANUAL Closure Impulse after CONTROL	<none>	todo

3.71 Grupo 21 Distance protection, general settings; Grupo General

Grupo 21 Distance protection, general settings; Grupo General

Nº	Parámetro	Valor	Grupo
1201	21 Distance protection is	ON	C
1202	Phase Current threshold for dist. meas.	0,50 A	C
1211	Angle of inclination, distance charact.	79 °	C
1208	Series compensated line	NO	C
1232	Instantaneous trip after SwitchOnToFault	with Zone Z1B	C
1241	R load, minimum Load Impedance (ph-g)	oo Ohm	C
1242	PHI load, maximum Load Angle (ph-g)	30 °	C
1243	R load, minimum Load Impedance (ph-ph)	oo Ohm	C
1244	PHI load, maximum Load Angle (ph-ph)	30 °	C
1357	Z1B enabled before 1st AR (int. or ext.)	YES	C

3.72 Grupo 21 Distance protection, general settings; Grupo Ground faults

Grupo 21 Distance protection, general settings; Grupo Ground faults

Nº	Parámetro	Valor	Grupo
1203	3I0 threshold for neutral current pickup	0,25 A	C
1204	3V0 threshold zero seq. voltage pickup	oo V	C
1207A	3I0>-pickup-stabilisation (3I0>/ Iphmax)	0,10	C
1209A	Criterion of ground fault recognition	3I0> OR 3V0>	C
1221A	Loop selection with 2Ph-G faults	all loops	C

3.73 Grupo 21 Distance protection, general settings; Grupo Time Delays

Grupo 21 Distance protection, general settings; Grupo Time Delays

Nº	Parámetro	Valor	Grupo
1210	21 Condition for zone timer start	with distance pickup	C
1305	T1-1phase, delay for single phase faults	0,00 sec	C
1306	T1multi-ph, delay for multi phase faults	0,00 sec	C
1315	T2-1phase, delay for single phase faults	0,40 sec	C
1316	T2multi-ph, delay for multi phase faults	0,40 sec	C
1325	T3 delay	2,00 sec	C
1335	T4 delay	2,00 sec	C
1345	T5 delay	oo sec	C
1355	T1B-1phase, delay for single ph. faults	0,00 sec	C
1356	T1B-multi-ph, delay for multi ph. faults	0,00 sec	C

3.74 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1

Nº	Parámetro	Valor	Grupo
1301	Operating mode Z1	Forward	C
1302	R(Z1), Resistance for ph-ph-faults	1,720 Ohm	C
1303	X(Z1), Reactance	1,720 Ohm	C
1304	RG(Z1), Resistance for ph-gnd faults	3,440 Ohm	C
1305	T1-1phase, delay for single phase faults	0,00 sec	C
1306	T1multi-ph, delay for multi phase faults	0,00 sec	C
1307	Zone Reduction Angle (load compensation)	0 °	C

3.75 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1B-exten.

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z1B-exten.

Nº	Parámetro	Valor	Grupo
1351	Operating mode Z1B (overrreach zone)	Forward	C
1352	R(Z1B), Resistance for ph-ph-faults	2,900 Ohm	C
1353	X(Z1B), Reactance	3,500 Ohm	C
1354	RG(Z1B), Resistance for ph-gnd faults	5,800 Ohm	C
1355	T1B-1phase, delay for single ph. faults	0,00 sec	C
1356	T1B-multi-ph, delay for multi ph. faults	0,00 sec	C
1357	Z1B enabled before 1st AR (int. or ext.)	YES	C

3.76 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z2

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z2

Nº	Parámetro	Valor	Grupo
1311	Operating mode Z2	Forward	C
1312	R(Z2), Resistance for ph-ph-faults	2,900 Ohm	C
1313	X(Z2), Reactance	3,500 Ohm	C
1314	RG(Z2), Resistance for ph-gnd faults	5,800 Ohm	C
1315	T2-1phase, delay for single phase faults	0,40 sec	C
1316	T2multi-ph, delay for multi phase faults	0,40 sec	C

3.77 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z3

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z3

Nº	Parámetro	Valor	Grupo
1321	Operating mode Z3	Reverse	C
1322	R(Z3), Resistance for ph-ph-faults	4,000 Ohm	C
1323	X(Z3), Reactance	4,000 Ohm	C
1324	RG(Z3), Resistance for ph-gnd faults	4,000 Ohm	C
1325	T3 delay	2,00 sec	C

3.78 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z4

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z4

Nº	Parámetro	Valor	Grupo
1331	Operating mode Z4	Forward	C
1332	R(Z4), Resistance for ph-ph-faults	5,500 Ohm	C
1333	X(Z4), Reactance	5,500 Ohm	C
1334	RG(Z4), Resistance for ph-gnd faults	11,000 Ohm	C
1335	T4 delay	2,00 sec	C

3.79 Grupo 21 Distance zones (quadrilateral); Grupo Zone Z5

Grupo 21 Distance zones (quadrilateral); Grupo Zone Z5

Nº	Parámetro	Valor	Grupo
1341	Operating mode Z5	Non-Directional	C
1342	R(Z5), Resistance for ph-ph-faults	5,520 Ohm	C
1343	X(Z5)+, Reactance for Forward direction	5,520 Ohm	C
1344	RG(Z5), Resistance for ph-gnd faults	11,200 Ohm	C
1345	T5 delay	oo sec	C
1346	X(Z5)-, Reactance for Reverse direction	4,000 Ohm	C

3.80 Grupo 68 Power Swing detection

Grupo 68 Power Swing detection

Nº	Parámetro	Valor	Grupo
2002	Power Swing Operating mode	all zones blocked	C
2006	68T Power swing trip	NO	C
2007	68 Trip delay after Power Swing Blocking	0,08 sec	C

3.81 Grupo 85-21 Pilot Prot. for Distance prot.

Grupo 85-21 Pilot Prot. for Distance prot.

Nº	Parámetro	Valor	Grupo
2101	85-21 Pilot Prot. for Distance prot.	ON	C
2102	Type of Line	Two Terminals	C
2103A	Time for send signal prolongation	0,10 sec	C
2109A	Transient Block.: Duration external flt.	0,04 sec	C
2110A	Transient Block.: Blk.T. after ext. flt.	0,20 sec	C

3.82 Grupo 50HS Instantaneous SOTF

Grupo 50HS Instantaneous SOTF

Nº	Parámetro	Valor	Grupo
2401	50HS Instantaneous SOTF-O/C is	ON	C

Grupo 50HS Instantaneous SOTF(2)

Nº	Parámetro	Valor	Grupo
2404	50HS SOTF-O/C PICKUP	12,50 A	C

3.83 Grupo Weak Infeed (Trip and/or Echo)

Grupo Weak Infeed (Trip and/or Echo)

Nº	Parámetro	Valor	Grupo
2501	Weak Infeed option	Echo only	C
2502A	Trip / Echo Delay after carrier receipt	0,04 sec	C
2503A	Trip Extension / Echo Impulse time	0,10 sec	C
2504A	Echo Block Time	0,50 sec	C
2505	Undervoltage (ph-g)	25 V	C
2509	Echo logic: 21 and 67N on common channel	NO	todo

3.84 Grupo 50(N)/51(N) Backup OverCurrent; Grupo General

Grupo 50(N)/51(N) Backup OverCurrent; Grupo General

Nº	Parámetro	Valor	Grupo
2601	Operating mode	ON:only active with Loss of VT sec. cir.	C
2680	Trip time delay after SOTF	0,00 sec	C

3.85 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B1

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B1

Nº	Parámetro	Valor	Grupo
2610	50-B1 Pickup	9,00 A	C
2611	50-B1 Delay	0,10 sec	C
2612	50N-B1 Pickup	9,00 A	C
2613	50N-B1 Delay	0,02 sec	C
2614	Instantaneous trip via BI	NO	C
2615	Instantaneous trip after SwitchOnToFault	NO	C

3.86 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B2

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-B2

Nº	Parámetro	Valor	Grupo
2620	50-B2 Pickup	oo A	C
2621	50-B2 Delay	oo sec	C
2622	50N-B2 Pickup	oo A	C
2623	50N-B2 Delay	oo sec	C
2624	Instantaneous trip via Pilot Prot./BI	NO	C
2625	Instantaneous trip after SwitchOnToFault	NO	C

3.87 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 51(N)-B

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 51(N)-B

Nº	Parámetro	Valor	Grupo
2640	51-B Pickup	3,46 A	C
2642	51-B Time Dial	0,15 sec	C
2646	51-B Additional Time Delay	0,00 sec	C
2650	51N-B Pickup	1,40 A	C
2652	51N-B Time Dial	0,13 sec	C
2656	51N-B Additional Time Delay	0,00 sec	C
2660	IEC Curve	Normal Inverse	C
2670	Instantaneous trip via Pilot Prot./BI	NO	C
2671	Instantaneous trip after SwitchOnToFault	NO	C

3.88 Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-STUB

Grupo 50(N)/51(N) Backup OverCurrent; Grupo 50(N)-STUB

Nº	Parámetro	Valor	Grupo
2630	50-STUB Pickup	oo A	C
2631	50-STUB Delay	0,30 sec	C
2632	50N-STUB Pickup	oo A	C
2633	50N-STUB Delay	2,00 sec	C
2634	Instantaneous trip via Pilot Prot./BI	NO	C
2635	Instantaneous trip after SwitchOnToFault	NO	C

3.89 Grupo Measurement Supervision; Grupo Balance / Summ.

Grupo Measurement Supervision; Grupo Balance / Summ.

Nº	Parámetro	Valor	Grupo
2901	Measurement Supervision	ON	C
2902A	Voltage Threshold for Balance Monitoring	50 V	C
2903A	Balance Factor for Voltage Monitor	0,75	C
2904A	Current Threshold for Balance Monitoring	0,50 A	C
2905A	Balance Factor for Current Monitor	0,50	C
2906A	Summated Current Monitoring Threshold	0,50 A	C
2907A	Summated Current Monitoring Factor	0,10	C
2908A	T Balance Factor for Voltage Monitor	5 sec	C
2909A	T Current Balance Monitor	5 sec	C

3.90 Grupo Measurement Supervision; Grupo Meas.Volt.Fail

Grupo Measurement Supervision; Grupo Meas.Volt.Fail

Nº	Parámetro	Valor	Grupo
2910	Fuse Failure Monitor	ON	C
2911A	Minimum Voltage Threshold V>	30 V	C
2912A	Maximum Current Threshold I<	0,50 A	C
2913A	Maximum Voltage Threshold V< (3phase)	5 V	C
2914A	Differential Current Threshold (3phase)	0,50 A	C
2915	Voltage Failure Supervision	with current superv. and CBpos(52a)	C
2916A	Delay Voltage Failure Supervision	3,00 sec	C

3.91 Grupo Measurement Supervision; Grupo VT mcb

Grupo Measurement Supervision; Grupo VT mcb

Nº	Parámetro	Valor	Grupo
2921	VT mcb operating time	5 ms	C

3.92 Grupo Measurement Supervision; Grupo Load Angle

Grupo Measurement Supervision; Grupo Load Angle

Nº	Parámetro	Valor	Grupo
2941	Limit setting PhiA	200 °	C
2942	Limit setting PhiB	340 °	C
2943	Minimum value I1>	0,25 A	C
2944	Minimum value U1>	20 V	C

3.93 Grupo 50N/51N Ground OverCurrent; Grupo General

Grupo 50N/51N Ground OverCurrent; Grupo General

Nº	Parámetro	Valor	Grupo
3101	50N/51N Ground Overcurrent	ON	C
3102	Block 50N/51N for Distance protection	NO	C
3174	Block 50N/51N for Pickup 21	in each zone	C
3104A	Stabilisation Slope with Iphase	10 %	C
3170	2nd harmonic ratio for inrush restraint	15 %	C
3171	Max.Current, overriding inrush restraint	37,50 A	C
3172	Instantaneous mode after SwitchOnToFault	with Pickup and direction	C
3173	Trip time delay after SOTF	0,00 sec	C

3.94 Grupo 50N/51N Ground OverCurrent; Grupo 50N-1

Grupo 50N/51N Ground OverCurrent; Grupo 50N-1

Nº	Parámetro	Valor	Grupo
3110	Operating mode	Forward	C
3111	Pickup	9,00 A	C
3112	Time Delay	0,03 sec	C
3113	Instantaneous trip via Pilot Prot./BI	NO	C
3114	Instantaneous trip after SwitchOnToFault	NO	C
3115	Inrush Blocking	NO	C

3.95 Grupo 50N/51N Ground OverCurrent; Grupo 50N-2

Grupo 50N/51N Ground OverCurrent; Grupo 50N-2

Nº	Parámetro	Valor	Grupo
3120	Operating mode	Inactive	C
3121	Pickup	2,00 A	C
3122	Time Delay	0,60 sec	C
3123	Instantaneous trip via Pilot Prot./BI	NO	C
3124	Instantaneous trip after SwitchOnToFault	NO	C
3125	Inrush Blocking	NO	C

3.96 Grupo 50N/51N Ground OverCurrent; Grupo 50N-3

Grupo 50N/51N Ground OverCurrent; Grupo 50N-3

Nº	Parámetro	Valor	Grupo
3130	Operating mode	Inactive	C
3131	Pickup	1,00 A	C
3132	Time Delay	0,90 sec	C
3133	Instantaneous trip via Pilot Prot./BI	NO	C
3134	Instantaneous trip after SwitchOnToFault	NO	C
3135	Inrush Blocking	NO	C

3.97 Grupo 50N/51N Ground OverCurrent; Grupo 51N InverseTime

Grupo 50N/51N Ground OverCurrent; Grupo 51N InverseTime

Nº	Parámetro	Valor	Grupo
3140	Operating mode	Forward	C
3141	Pickup	1,40 A	C
3143	Time Dial	0,14 sec	C
3147	Additional Time Delay	0,00 sec	C
3148	Instantaneous trip via Pilot Prot./BI	NO	C
3149	Instantaneous trip after SwitchOnToFault	NO	C
3150	Inrush Blocking	NO	C
3151	IEC Curve	Normal Inverse	C

3.98 Grupo 50N/51N Ground OverCurrent; Grupo Direction

Grupo 50N/51N Ground OverCurrent; Grupo Direction

Nº	Parámetro	Valor	Grupo
3160	Polarization	with Vo + Ig or V2	C
3162A	ALPHA, lower angle for forward direction	338 °	C
3163A	BETA, upper angle for forward direction	122 °	C
3164	Min. zero seq.voltage 3Vo for polarizing	3,0 V	C
3166	Min. neg. seq. polarizing voltage 3V2	3,0 V	C
3167	Min. neg. seq. polarizing current 3I2	0,25 A	C
3168	Compensation angle PHI comp. for Sr	255 °	C
3169	Forward direction power threshold	1,5 VA	C

3.99 Grupo Fault Locator

Grupo Fault Locator

Nº	Parámetro	Valor	Grupo
3802	Start fault locator with	TRIP	C
3806	Load Compensation	NO	C

3.100 Grupo 50BF Breaker Failure; Grupo 50BF

Grupo 50BF Breaker Failure; Grupo 50BF

Nº	Parámetro	Valor	Grupo
3901	50BF Breaker Failure Protection	ON	C
3902	50BF Pickup current threshold	6,00 A	C
3904	Delay after 1pole start for local trip	0,02 sec	C
3905	Delay after 3pole start for local trip	0,02 sec	C
3906	Delay of 2nd element for busbar trip	0,20 sec	C
3907	Delay for start with defective bkr.	0,00 sec	C
3908	Trip output selection with defective bkr	NO	C
3909	Check Breaker contacts	YES	C

3.101 Grupo 50BF Breaker Failure; Grupo End fault prot.

Grupo 50BF Breaker Failure; Grupo End fault prot.

Nº	Parámetro	Valor	Grupo
3921	End fault element	OFF	C
3922	Trip delay of end fault element	2,00 sec	C

3.102 Grupo 50BF Breaker Failure; Grupo PoleDiscrepancy

Grupo 50BF Breaker Failure; Grupo PoleDiscrepancy

Nº	Parámetro	Valor	Grupo
3931	Pole Discrepancy supervision	OFF	C
3932	Trip delay with pole discrepancy	2,00 sec	C

RANCAGUA_LIAAJAH2_A1_S2_140527.URS
Y:\CRAP\ARCHIVOS DE CONFIGURACIÝN\04_OCS\RANCAGUA
DEVICE DEFINITION
FILES
ORDER CODE: D60-G00-HCL-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

PRODUCT SETUP

DISPLAY PROPERTIES

Flash Message Time	2.0 s
Default Message Timeout	15 s
Default Message Intensity (VFD Only)	25 %
Screen Saver Feature (LCD Only)	Enabled
Screen Saver Wait Time (LCD Only)	10 min
Current Cutoff Level	0.010 pu
Voltage Cutoff Level	1.0 V

COMMUNICATIONS

SERIAL PORTS

RS485 Com2 Baud Rate	19200
RS485 Com2 Parity	None
RS485 Com2 Response Min Time	0 ms

NETWORK

IP Address	10. 80.143.187
IP Subnet Mask	255.255.255. 0
Gateway IP Address	10. 80.143. 1
Ethernet Operation Mode	Full-Duplex

MODBUS PROTOCOL

Modbus Slave Address	254
Modbus TCP Port Number	502

DNP PROTOCOL

DNP Channel 1 Port	NETWORK
DNP Channel 2 Port	NONE
DNP Address	3
DNP Client Address 1	10. 80.143.200
DNP Client Address 2	10. 80.143.201
DNP Client Address 3	0. 0. 0. 0
DNP Client Address 4	0. 0. 0. 0
DNP Client Address 5	0. 0. 0. 0
DNP TCP/UDP Port Number	20000
DNP Unsol Resp Function	Disabled
DNP Unsol Resp Timeout	5 s
DNP Unsol Resp Max Retries	10
DNP Unsol Resp Dest Addr	10
DNP Current Scale Factor	1
DNP Voltage Scale Factor	1
DNP Power Scale Factor	1
DNP Energy Scale Factor	1
DNP Other Scale Factor	1
DNP Current Default Deadband	30000
DNP Voltage Default Deadband	30000
DNP Power Default Deadband	30000
DNP Energy Default Deadband	30000
DNP Other Default Deadband	30000
DNP Time Sync IIN Period	1440 min
DNP Message Fragment Size	240
DNP Object 1 Default Variation	2
DNP Object 2 Default Variation	2
DNP Object 20 Default Variation	1
DNP Object 21 Default Variation	1
DNP Object 22 Default Variation	1
DNP Object 23 Default Variation	1
DNP Object 30 Default Variation	1
DNP Object 32 Default Variation	1
DNP Number of Paired Controls	0

DNP - IEC104 POINTS LISTS

DNP Binary Input Point 0	LED NEUTRAL/GROUND
DNP Binary Input Point 1	LED PHASE A
DNP Binary Input Point 2	LED PHASE B
DNP Binary Input Point 3	LED PHASE C
DNP Binary Input Point 4	LED TRIP
DNP Binary Input Point 5	PH DIST Z1 OP
DNP Binary Input Point 6	PH DIST Z2 OP

RANCAGUA_LIAAJAH2_A1_S2_140527.URS
Y:\CRAP\ARCHIVOS DE CONFIGURACIÝN\04_OCS\RANCAGUA
DEVICE DEFINITION
FILES
ORDER CODE: D60-G00-HCL-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

DNP - IEC104 POINTS LISTS (continued from last page)

DNP Binary Input Point 7	PH DIST Z3 OP
DNP Binary Input Point 8	PH DIST Z4 OP
DNP Binary Input Point 9	PH DIST Z5 OP
DNP Binary Input Point 10	LINE PICKUP OP
DNP Binary Input Point 11	SETTING GROUP ACT 1
DNP Binary Input Point 12	SETTING GROUP ACT 2
DNP Binary Input Point 13	PHASE TOC1 OP
DNP Binary Input Point 14	POWER SWING UN/BLOCK
DNP Binary Input Point 15	NEUTRAL TOC1 OP
DNP Binary Input Point 16	GND DIST Z1 OP
DNP Binary Input Point 17	GND DIST Z2 OP
DNP Binary Input Point 18	GND DIST Z3 OP
DNP Binary Input Point 19	GND DIST Z5 OP
DNP Binary Input Point 20	GND DIST Z4 OP
DNP Binary Input Point 21	AR 3-P/1 RIP
DNP Binary Input Point 22	AR CLOSE BKR 1
DNP Binary Input Point 23	AR BKR 1 BLK
DNP Binary Input Point 24	AR DISABLED
DNP Binary Input Point 25	AR ENABLED
DNP Analog Input Point 0	Fault Location [1]
DNP Analog Input Point 1	Fault Type [1]

HTTP

HTTP TCP Port Number	80

TFTP

TFTP Main UDP Port Number	69
TFTP Data UDP Port Number 1	0
TFTP Data UDP Port Number 2	0

REAL TIME CLOCK

IRIG-B Signal Type	DC Shift
Real Time Clock Events	Disabled

FAULT REPORT

Fault Report 1 Source	LINEA (SRC 1)
Fault Report 1 Trigger	pkp Z1o z2 On (VO4)
Fault Report 1 Positive Seq (Z1) Mag	2.19 ohms
Fault Report 1 Positive Seq (Z1) Angle	79 deg
Fault Report 1 Zero Seq (Z0) Mag	7.36 ohms
Fault Report 1 Zero Seq (Z0) Angle	81 deg
Fault Report 1 Line Length Units	km
Fault Report 1 Line Length	60.6

OSCILLOGRAPHY

Number Of Records	10
Trigger Mode	Automatic Overwrite
Trigger Position	20 %
Trigger Source	OSCILOGRAFIA On (VO3)
AC Input Waveforms	32 samples/cycle
Digital Channel 1	PH DIST Z1 OP
Digital Channel 2	PH DIST Z2 OP
Digital Channel 3	PH DIST Z3 OP
Digital Channel 4	PH DIST Z4 OP
Digital Channel 5	GND DIST Z1 OP
Digital Channel 6	GND DIST Z2 OP
Digital Channel 7	GND DIST Z3 OP
Digital Channel 8	GND DIST Z4 OP
Digital Channel 9	PHASE TOC1 OP
Digital Channel 10	PH DIR1 BLK
Digital Channel 11	NEUTRAL TOC1 OP
Digital Channel 12	NTRL DIR OC1 REV
Digital Channel 13	NTRL DIR OC2 FWD
Digital Channel 14	HYBRID POTT OP
Digital Channel 15	POWER SWING BLOCK
Digital Channel 16	PH DIST Z1 PKP
Digital Channel 17	PH DIST Z2 PKP
Digital Channel 18	PH DIST Z3 PKP
Digital Channel 19	PH DIST Z4 PKP

RANCAGUA_LIAAJAH2_A1_S2_140527.URS
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DEVICE DEFINITION
FILES
ORDER CODE: D60-G00-HCL-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

OSCILLOGRAPHY (continued from last page)

Digital Channel 20	LINE PICKUP OP
Digital Channel 21	PHASE IOC1 OP
Digital Channel 22	AR 1-P RIP
Digital Channel 23	AR CLOSE BKR 1
Digital Channel 24	HYBRID POTT TX1
Digital Channel 25	AR LO
Digital Channel 26	CIERRE MANUA On(W3a)
Digital Channel 27	79 DESCO On(H7a)
Digital Channel 28	79 conectado On(H7c)
Digital Channel 29	63-FALLA PRE On(H8a)
Digital Channel 30	52A1 (a) On(H8c)
Digital Channel 31	ECHO 3P On (VO37)
Digital Channel 32	RECEP JAHUEL On(W1a)
Digital Channel 33	RECEP ITAHUE On(W1c)
Digital Channel 34	ITE AC FALLA On(W4a)
Digital Channel 35	AUTORI 79 On(W5a)
Digital Channel 36	GND DIST Z1 PKP
Digital Channel 37	GND DIST Z2 PKP
Digital Channel 38	GND DIST Z3 PKP
Digital Channel 39	GND DIST Z4 PKP
Digital Channel 40	PUTT TX1
Digital Channel 41	PUTT TX2
Digital Channel 42	BLQ Zonas PH On (VO1)
Digital Channel 43	TRIP GRAL On (VO2)
Digital Channel 44	pkp Z1o z2 On (VO4)
Digital Channel 45	BLOq reconec On (VO5)
Digital Channel 46	ORD. CIERRE On (VO6)
Digital Channel 47	Alarma f. re On (VO7)
Digital Channel 48	POWER SWING 50DD
Digital Channel 49	POWER SWING INNER
Digital Channel 50	POWER SWING OUTER
Digital Channel 51	POWER SWING UN/BLOCK
Digital Channel 52	AR BKR 1 BLK
Digital Channel 53	AR CLOSE BKR 1
Digital Channel 54	TX MMOO On (VO12)
Digital Channel 55	AR 3-P/1 RIP
Digital Channel 56	AR DISABLED
Digital Channel 57	LOAD ENCHR OP
Digital Channel 58	SRC1 50DD OP
Digital Channel 59	BKR FAIL 1 T1 OP
Digital Channel 60	NEUTRAL IOC1 OP
Digital Channel 61	NEUTRAL TOC1 PKP
Digital Channel 62	GND DIST Z5 OP
Digital Channel 63	PH DIST Z5 OP
Analog Channel 1	SRC1 I_0 Mag
Analog Channel 2	SRC1 V_0 Mag
Analog Channel 3	SRC1 I_0 Angle
Analog Channel 4	SRC1 V_0 Angle
Analog Channel 5	SRC1 P
Analog Channel 6	Fault Location [1]
Analog Channel 7	SRC1 Frequency
Analog Channel 8	SRC1 In Mag
Analog Channel 9	SRC1 In Angle
Analog Channel 10	Brk 1 Op Time
Analog Channel 11	Fault Type [1]
Analog Channel 12	Tracking Frequency
Analog Channel 13	SRC1 S

DATA LOGGER

Data Logger Mode	Continuous
Data Logger Trigger	OFF
Rate	60000 msec

USER-PROGRAMMABLE LEDS

TRIP AND ALARMS LEDS

Trip LED Input	TRIP 3-POLE

USER PROGRAMMABLE LEDS

LED 1: OPERAND	RECEP ACELER On (VO22)

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DESCRIPTION: (NONE)
TEXT COLOR

USER PROGRAMMABLE LEDS (continued from last page)

LED 1: TYPE	Latched
LED 2: OPERAND	LED Z1 On (VO13)
LED 2: TYPE	Latched
LED 3: OPERAND	LED Z2 On (VO14)
LED 3: TYPE	Latched
LED 4: OPERAND	LED Z3 On (VO15)
LED 4: TYPE	Latched
LED 5: OPERAND	LED Z4 On (VO16)
LED 5: TYPE	Latched
LED 6: OPERAND	79 off On (VO18)
LED 6: TYPE	Self-Reset
LED 7: OPERAND	79 on On (VO17)
LED 7: TYPE	Self-Reset
LED 8: OPERAND	LINE PICKUP OP
LED 8: TYPE	Latched
LED 9: OPERAND	52A1 (a) Off(H8c)
LED 9: TYPE	Self-Reset
LED 10: OPERAND	52A1 (a) On(H8c)
LED 10: TYPE	Self-Reset
LED 11: OPERAND	Alarma f. re On (VO7)
LED 11: TYPE	Self-Reset
LED 12: OPERAND	67-67N On (VO27)
LED 12: TYPE	Latched
LED 13: OPERAND	51-51N On (VO28)
LED 13: TYPE	Latched
LED 14: OPERAND	50-50N On (VO29)
LED 14: TYPE	Latched
LED 15: OPERAND	AR 3-P/1 RIP
LED 15: TYPE	Self-Reset
LED 16: OPERAND	AR LO
LED 16: TYPE	Self-Reset
LED 17: OPERAND	POWER SWING UN/BLOCK
LED 17: TYPE	Latched
LED 18: OPERAND	SRC1 VT FUSE FAIL OP
LED 18: TYPE	Self-Reset
LED 19: OPERAND	BKR FAIL 1 T2 OP
LED 19: TYPE	Latched
LED 20: OPERAND	TX MMOO On (VO12)
LED 20: TYPE	Latched
LED 21: OPERAND	BLQ Zonas PH On (VO1)
LED 21: TYPE	Self-Reset
LED 22: OPERAND	ORD. CIERRE On (VO6)
LED 22: TYPE	Latched
LED 23: OPERAND	Z5 operada On (VO35)
LED 23: TYPE	Latched
LED 25: OPERAND	SETTING GROUP ACT 1
LED 25: TYPE	Self-Reset
LED 26: OPERAND	SETTING GROUP ACT 2
LED 26: TYPE	Self-Reset
LED 27: OPERAND	SETTING GROUP ACT 3
LED 27: TYPE	Self-Reset

USER-PROGRAMMABLE SELF TESTS

Battery Fail Function	Enabled

CONTROL PUSHBUTTONS

CPB 1: Function	Enabled
CPB 1: Events	Enabled
CPB 3: Function	Enabled
CPB 3: Events	Enabled

USER-DEFINABLE DISPLAYS

USER DISPLAY 1: Top Line	LINEA ITAHUE 154 kV
USER DISPLAY 1: Bottom Line	SISTEMA 2
USER DISPLAY 1: Item 1	0
USER DISPLAY 1: Item 2	0
USER DISPLAY 1: Item 3	0
USER DISPLAY 1: Item 4	0
USER DISPLAY 1: Item 5	0

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VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

USER-DEFINABLE DISPLAYS (continued from last page)

USER DISPLAY 2: Top Line	LOCALIZACION FALLA
USER DISPLAY 2: Bottom Line	~ km
USER DISPLAY 2: Item 1	9061
USER DISPLAY 2: Item 2	0
USER DISPLAY 2: Item 3	0
USER DISPLAY 2: Item 4	0
USER DISPLAY 2: Item 5	0
USER DISPLAY 3: Top Line	IA IB IC
USER DISPLAY 3: Bottom Line	~ ~ ~
USER DISPLAY 3: Item 1	6144
USER DISPLAY 3: Item 2	6146
USER DISPLAY 3: Item 3	6148
USER DISPLAY 3: Item 4	0
USER DISPLAY 3: Item 5	0
USER DISPLAY 4: Top Line	P 3FASE
USER DISPLAY 4: Bottom Line	~
USER DISPLAY 4: Item 1	7168
USER DISPLAY 4: Item 2	0
USER DISPLAY 4: Item 3	0
USER DISPLAY 4: Item 4	0
USER DISPLAY 4: Item 5	0
USER DISPLAY 5: Top Line	Q 3FASE
USER DISPLAY 5: Bottom Line	~
USER DISPLAY 5: Item 1	7176
USER DISPLAY 5: Item 2	0
USER DISPLAY 5: Item 3	0
USER DISPLAY 5: Item 4	0
USER DISPLAY 5: Item 5	0
USER DISPLAY 6: Top Line	S 3FASE
USER DISPLAY 6: Bottom Line	~
USER DISPLAY 6: Item 1	7184
USER DISPLAY 6: Item 2	0
USER DISPLAY 6: Item 3	0
USER DISPLAY 6: Item 4	0
USER DISPLAY 6: Item 5	0
Invoke and Scroll	ON

INSTALLATION

Relay Name	SISTEMA 1 ITAHUE

SYSTEM SETUP

AC INPUTS

CURRENT

CT F1: Phase CT Primary	600 A
CT F1: Phase CT Secondary	5 A
CT F1: Ground CT Primary	600 A
CT F1: Ground CT Secondary	5 A

VOLTAGE

VT F5: Phase VT Connection	Wye
VT F5: Phase VT Secondary	66.4 V
VT F5: Phase VT Ratio	1400.00 :1
VT F5: Auxiliary VT Connection	Vbg
VT F5: Auxiliary VT Secondary	66.4 V
VT F5: Auxiliary VT Ratio	1400.00 :1

POWER SYSTEM

Nominal Frequency	50 Hz
Phase Rotation	ABC
Frequency And Phase Reference	LINEA (SRC 1)
Frequency Tracking Function	Enabled

SIGNAL SOURCES

SOURCE 1: Name	LINEA
SOURCE 1: Phase CT	F1
SOURCE 1: Ground CT	F1
SOURCE 1: Phase VT	F5
SOURCE 1: Auxiliary VT	None
SOURCE 2: Name	BARRA

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VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

SIGNAL SOURCES (continued from last page)

SOURCE 2: Phase CT	None
SOURCE 2: Ground CT	None
SOURCE 2: Phase VT	None
SOURCE 2: Auxiliary VT	F5

BREAKERS

Breaker 1 Function	Enabled
Breaker 1 Push Button Control	Disabled
Breaker 1 Name	52A2
Breaker 1 Mode	3-Pole
Breaker 1 Open	OFF
Breaker 1 Close	CIERRE MANUA Off(W3a)
Breaker 1 Phase A/3-Pole	52A1 (a) On(H8c)
Breaker 1 Phase B	OFF
Breaker 1 Phase C	OFF
Breaker 1 External Alarm	OFF
Breaker 1 Alarm Delay	0.000 s
Breaker 1 Manual Close Recal Time	0.000 s
Breaker 1 Out Of Service	63-FALLA PRE On(H8a)

FLEXLOGIC

FLEXLOGIC EQUATION EDITOR

FlexLogic Entry 1	POWER SWING BLOCK
FlexLogic Entry 2	NEUTRAL TOC1 PKP
FlexLogic Entry 3	NOT
FlexLogic Entry 4	AND(2)
FlexLogic Entry 5	= POWER SWING (VO8)
FlexLogic Entry 6	ITE AC FALLA On(W4a)
FlexLogic Entry 7	POWER SWING UN/BLOCK
FlexLogic Entry 8	SRC1 VT FUSE FAIL OP
FlexLogic Entry 9	OR(3)
FlexLogic Entry 10	= BLQ Zonas PH (VO1)
FlexLogic Entry 11	PH DIST Z1 OP
FlexLogic Entry 12	PH DIST Z2 OP
FlexLogic Entry 13	PH DIST Z3 OP
FlexLogic Entry 14	PH DIST Z4 OP
FlexLogic Entry 15	PH DIST Z5 OP
FlexLogic Entry 16	GND DIST Z1 OP
FlexLogic Entry 17	GND DIST Z2 OP
FlexLogic Entry 18	GND DIST Z3 OP
FlexLogic Entry 19	GND DIST Z4 OP
FlexLogic Entry 20	GND DIST Z5 OP
FlexLogic Entry 21	OR(10)
FlexLogic Entry 22	PHASE TOC1 OP
FlexLogic Entry 23	NEUTRAL TOC1 OP
FlexLogic Entry 24	PHASE TOC2 OP
FlexLogic Entry 25	NEUTRAL TOC2 OP
FlexLogic Entry 26	PHASE IOC1 OP
FlexLogic Entry 27	NEUTRAL IOC1 OP
FlexLogic Entry 28	HYBRID POTT OP
FlexLogic Entry 29	LINE PICKUP OP
FlexLogic Entry 30	OR(8)
FlexLogic Entry 31	OR(2)
FlexLogic Entry 32	= TRIP GRAL (VO2)
FlexLogic Entry 33	BLQ Zonas PH On (VO1)
FlexLogic Entry 34	POWER SWING On (VO8)
FlexLogic Entry 35	TRIP GRAL On (VO2)
FlexLogic Entry 36	OR(3)
FlexLogic Entry 37	= OSCILOGRAFIA (VO3)
FlexLogic Entry 38	PH DIST Z1 PKP
FlexLogic Entry 39	GND DIST Z1 PKP
FlexLogic Entry 40	PH DIST Z2 PKP
FlexLogic Entry 41	GND DIST Z2 PKP
FlexLogic Entry 42	OR(4)
FlexLogic Entry 43	= pkp Z1o z2 (VO4)
FlexLogic Entry 44	AR CLOSE BKR 1
FlexLogic Entry 45	= ORD. CIERRE (VO6)
FlexLogic Entry 46	TRIP 3-POLE
FlexLogic Entry 47	TIMER 1

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VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

FLEXLOGIC EQUATION EDITOR (continued from last page)

FlexLogic Entry 48	= Alarma trip (VO10)
FlexLogic Entry 49	HYBRID POTT TX1
FlexLogic Entry 50	TIMER 2
FlexLogic Entry 51	= TX OPLAT (VO11)
FlexLogic Entry 52	HYBRID POTT TX1
FlexLogic Entry 53	TIMER 3
FlexLogic Entry 54	= TX MMOO (VO12)
FlexLogic Entry 55	GND DIST Z1 OP
FlexLogic Entry 56	PH DIST Z1 OP
FlexLogic Entry 57	OR(2)
FlexLogic Entry 58	= LED Z1 (VO13)
FlexLogic Entry 59	GND DIST Z2 OP
FlexLogic Entry 60	PH DIST Z2 OP
FlexLogic Entry 61	OR(2)
FlexLogic Entry 62	= LED Z2 (VO14)
FlexLogic Entry 63	PH DIST Z3 OP
FlexLogic Entry 64	GND DIST Z3 OP
FlexLogic Entry 65	OR(2)
FlexLogic Entry 66	= LED Z3 (VO15)
FlexLogic Entry 67	PH DIST Z4 OP
FlexLogic Entry 68	GND DIST Z4 OP
FlexLogic Entry 69	OR(2)
FlexLogic Entry 70	= LED Z4 (VO16)
FlexLogic Entry 71	79 conectado On(H7c)
FlexLogic Entry 72	AUTORI 79 On(W5a)
FlexLogic Entry 73	AND(2)
FlexLogic Entry 74	= 79 on (VO17)
FlexLogic Entry 75	79 on On (VO17)
FlexLogic Entry 76	NOT
FlexLogic Entry 77	= 79 off (VO18)
FlexLogic Entry 78	PH DIST Z1 PKP
FlexLogic Entry 79	PH DIST Z2 PKP
FlexLogic Entry 80	PH DIST Z3 PKP
FlexLogic Entry 81	PH DIST Z4 PKP
FlexLogic Entry 82	GND DIST Z1 PKP
FlexLogic Entry 83	GND DIST Z2 PKP
FlexLogic Entry 84	GND DIST Z3 PKP
FlexLogic Entry 85	GND DIST Z4 PKP
FlexLogic Entry 86	PHASE TOC1 PKP
FlexLogic Entry 87	NEUTRAL TOC1 PKP
FlexLogic Entry 88	LINE PICKUP PKP
FlexLogic Entry 89	OR(11)
FlexLogic Entry 90	= reset led (VO19)
FlexLogic Entry 91	RECEP JAHUEL On(W1a)
FlexLogic Entry 92	RECEP ITAHUE On(W1c)
FlexLogic Entry 93	OR(2)
FlexLogic Entry 94	= RECEP ACELER (VO22)
FlexLogic Entry 95	PH DIST Z1 OP
FlexLogic Entry 96	GND DIST Z1 OP
FlexLogic Entry 97	OR(2)
FlexLogic Entry 98	= OPERA ZONA 1 (VO23)
FlexLogic Entry 99	PH DIST Z2 OP
FlexLogic Entry 100	GND DIST Z2 OP
FlexLogic Entry 101	OR(2)
FlexLogic Entry 102	= OPERA ZONA 2 (VO24)
FlexLogic Entry 103	PH DIST Z3 OP
FlexLogic Entry 104	PH DIST Z4 OP
FlexLogic Entry 105	GND DIST Z3 OP
FlexLogic Entry 106	GND DIST Z4 OP
FlexLogic Entry 107	OR(4)
FlexLogic Entry 108	= OPERA Z3/Z4 (VO25)
FlexLogic Entry 109	PHASE TOC1 OP
FlexLogic Entry 110	NEUTRAL IOC1 OP
FlexLogic Entry 111	NEUTRAL TOC1 OP
FlexLogic Entry 112	OR(3)
FlexLogic Entry 113	BLQ Zonas PH On (VO1)
FlexLogic Entry 114	NOT
FlexLogic Entry 115	AND(2)
FlexLogic Entry 116	= 67-67N (VO27)

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VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

FLEXLOGIC EQUATION EDITOR (continued from last page)

FlexLogic Entry 117	PHASE TOC1 OP
FlexLogic Entry 118	NEUTRAL IOC1 OP
FlexLogic Entry 119	NEUTRAL TOC1 OP
FlexLogic Entry 120	OR(3)
FlexLogic Entry 121	BLQ Zonas PH On (VO1)
FlexLogic Entry 122	AND(2)
FlexLogic Entry 123	= 51-51N (VO28)
FlexLogic Entry 124	PHASE IOC1 OP
FlexLogic Entry 125	NEUTRAL IOC1 OP
FlexLogic Entry 126	OR(2)
FlexLogic Entry 127	= 50-50N (VO29)
FlexLogic Entry 128	ITE AC FALLA On(W4a)
FlexLogic Entry 129	ANY MAJOR ERROR
FlexLogic Entry 130	SRC1 VT FUSE FAIL OP
FlexLogic Entry 131	OR(3)
FlexLogic Entry 132	= Alarma f. re (VO7)
FlexLogic Entry 133	BLQ Zonas PH On (VO1)
FlexLogic Entry 134	LOAD ENCHR OP
FlexLogic Entry 135	OR(2)
FlexLogic Entry 136	= Load encroch (VO30)
FlexLogic Entry 137	Alarma f. re On (VO7)
FlexLogic Entry 138	NOT
FlexLogic Entry 139	= BLOQ 51 (VO31)
FlexLogic Entry 140	NTRL DIR OC1 REV
FlexLogic Entry 141	= REVERSE (VO32)
FlexLogic Entry 142	NTRL DIR OC1 FWD
FlexLogic Entry 143	= FORWARD (VO33)
FlexLogic Entry 144	BREAKER 1 OPEN
FlexLogic Entry 145	= BRK OPEN (VO34)
FlexLogic Entry 146	PH DIST Z5 OP
FlexLogic Entry 147	GND DIST Z5 OP
FlexLogic Entry 148	OR(2)
FlexLogic Entry 149	= Z5 operada (VO35)
FlexLogic Entry 150	RECEP JAHUEL On(W1a)
FlexLogic Entry 151	RECEP ITAHUE On(W1c)
FlexLogic Entry 152	SETTING GROUP ACT 1
FlexLogic Entry 153	AND(3)
FlexLogic Entry 154	RECEP JAHUEL On(W1a)
FlexLogic Entry 155	SETTING GROUP ACT 2
FlexLogic Entry 156	AND(2)
FlexLogic Entry 157	OR(2)
FlexLogic Entry 158	= RECEP 3P (VO36)
FlexLogic Entry 159	RECEP 3P On (VO36)
FlexLogic Entry 160	BREAKER 1 OPEN
FlexLogic Entry 161	AND(2)
FlexLogic Entry 162	= ECHO 3P (VO37)
FlexLogic Entry 163	52aP.CORTE On(W2c)
FlexLogic Entry 164	NOT
FlexLogic Entry 165	52b P. CORTE On(W2a)
FlexLogic Entry 166	SETTING GROUP ACT 1
FlexLogic Entry 167	AND(3)
FlexLogic Entry 168	CONTROL PUSHBUTTON 3 ON
FlexLogic Entry 169	POSITIVE ONE SHOT
FlexLogic Entry 170	SETTING GROUP ACT 1
FlexLogic Entry 171	AND(2)
FlexLogic Entry 172	OR(2)
FlexLogic Entry 173	= set grupo (VO38)
FlexLogic Entry 174	52aP.CORTE On(W2c)
FlexLogic Entry 175	52b P. CORTE On(W2a)
FlexLogic Entry 176	NOT
FlexLogic Entry 177	SETTING GROUP ACT 2
FlexLogic Entry 178	AND(3)
FlexLogic Entry 179	CONTROL PUSHBUTTON 3 ON
FlexLogic Entry 180	POSITIVE ONE SHOT
FlexLogic Entry 181	SETTING GROUP ACT 2
FlexLogic Entry 182	AND(2)
FlexLogic Entry 183	OR(2)
FlexLogic Entry 184	= reset grupo (VO39)
FlexLogic Entry 185	END

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VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

FLEXLOGIC TIMERS

Timer 1: Type	second
Timer 1: Pickup Delay	0
Timer 1: Dropout Delay	7
Timer 2: Type	millisecond
Timer 2: Pickup Delay	0
Timer 2: Dropout Delay	50
Timer 3: Type	millisecond
Timer 3: Pickup Delay	0
Timer 3: Dropout Delay	50

NON-VOLATILE LATCHES

LATCH 1: Function	Enabled
LATCH 1: Type	Reset Dominant
LATCH 1: Set	set grupo On (VO38)
LATCH 1: Reset	reset grupo On (VO39)
LATCH 1: Target	Disabled
LATCH 1: Events	Enabled

GROUPED ELEMENTS

GROUP 1

LINE PICKUP [GROUP 1]

Function	Enabled
Signal Source	LINEA (SRC 1)
Phase IOC Line Pickup	1.250 pu
UV Pickup	0.800 pu
Line End Open Pickup Delay	0.200 s
Line End Open Reset Delay	0.200 s
OV Pickup Delay	0.200 s
Autoreclose Coordination Bypass	Enabled
Autoreclose Coordination Pickup Delay	0.045 s
Autoreclose Coordination Reset Delay	0.005 s
Terminal Open	BREAKER 1 OPEN
AR Accelerate	OFF
Block	OFF
Target	Self-reset
Events	Enabled

DISTANCE

DISTANCE [GROUP 1]

Source	LINEA (SRC 1)
Memory Duration	10 cycles
Force Self-Polar	OFF
Force Mem-Polar	OFF

PHASE DISTANCE [GROUP 1]

PHASE DISTANCE Z1: Function	Enabled
PHASE DISTANCE Z1: Direction	Forward
PHASE DISTANCE Z1: Shape	Quad
PHASE DISTANCE Z1: Xfmr Vol Connection	None
PHASE DISTANCE Z1: Xfmr Curr Connection	None
PHASE DISTANCE Z1: Reach	2.74 ohms
PHASE DISTANCE Z1: RCA	90 deg
PHASE DISTANCE Z1: Rev Reach	0.02 ohms
PHASE DISTANCE Z1: Rev Reach RCA	78 deg
PHASE DISTANCE Z1: Comp Limit	90 deg
PHASE DISTANCE Z1: DIR RCA	49 deg
PHASE DISTANCE Z1: DIR Comp Limit	71 deg
PHASE DISTANCE Z1: Quad Right Blinder	2.74 ohms
PHASE DISTANCE Z1: Quad Right Blinder RCA	78 deg
PHASE DISTANCE Z1: Quad Left Blinder	2.74 ohms
PHASE DISTANCE Z1: Quad Left Blinder RCA	78 deg
PHASE DISTANCE Z1: Supervision	0.100 pu
PHASE DISTANCE Z1: Volt Level	0.000 pu
PHASE DISTANCE Z1: Delay	0.000 s
PHASE DISTANCE Z1: Block	BLQ Zonas PH On (VO1)
PHASE DISTANCE Z1: Target	Self-reset
PHASE DISTANCE Z1: Events	Enabled
PHASE DISTANCE Z2: Function	Enabled

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VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

PHASE DISTANCE [GROUP 1] (continued from last page)

PHASE DISTANCE Z2: Direction	Forward
PHASE DISTANCE Z2: Shape	Quad
PHASE DISTANCE Z2: Xfmr Vol Connection	None
PHASE DISTANCE Z2: Xfmr Curr Connection	None
PHASE DISTANCE Z2: Reach	25.68 ohms
PHASE DISTANCE Z2: RCA	90 deg
PHASE DISTANCE Z2: Rev Reach	0.02 ohms
PHASE DISTANCE Z2: Rev Reach RCA	78 deg
PHASE DISTANCE Z2: Comp Limit	90 deg
PHASE DISTANCE Z2: DIR RCA	49 deg
PHASE DISTANCE Z2: DIR Comp Limit	71 deg
PHASE DISTANCE Z2: Quad Right Blinder	21.00 ohms
PHASE DISTANCE Z2: Quad Right Blinder RCA	78 deg
PHASE DISTANCE Z2: Quad Left Blinder	21.00 ohms
PHASE DISTANCE Z2: Quad Left Blinder RCA	78 deg
PHASE DISTANCE Z2: Supervision	0.100 pu
PHASE DISTANCE Z2: Volt Level	0.000 pu
PHASE DISTANCE Z2: Delay	65.535 s
PHASE DISTANCE Z2: Block	Load encroch On (VO30)
PHASE DISTANCE Z2: Target	Self-reset
PHASE DISTANCE Z2: Events	Enabled
PHASE DISTANCE Z3: Function	Enabled
PHASE DISTANCE Z3: Direction	Forward
PHASE DISTANCE Z3: Shape	Quad
PHASE DISTANCE Z3: Xfmr Vol Connection	None
PHASE DISTANCE Z3: Xfmr Curr Connection	None
PHASE DISTANCE Z3: Reach	5.52 ohms
PHASE DISTANCE Z3: RCA	90 deg
PHASE DISTANCE Z3: Rev Reach	0.02 ohms
PHASE DISTANCE Z3: Rev Reach RCA	78 deg
PHASE DISTANCE Z3: Comp Limit	90 deg
PHASE DISTANCE Z3: DIR RCA	49 deg
PHASE DISTANCE Z3: DIR Comp Limit	71 deg
PHASE DISTANCE Z3: Quad Right Blinder	5.52 ohms
PHASE DISTANCE Z3: Quad Right Blinder RCA	78 deg
PHASE DISTANCE Z3: Quad Left Blinder	5.52 ohms
PHASE DISTANCE Z3: Quad Left Blinder RCA	78 deg
PHASE DISTANCE Z3: Supervision	0.100 pu
PHASE DISTANCE Z3: Volt Level	0.000 pu
PHASE DISTANCE Z3: Delay	0.600 s
PHASE DISTANCE Z3: Block	BLQ Zonas PH On (VO1)
PHASE DISTANCE Z3: Target	Self-reset
PHASE DISTANCE Z3: Events	Enabled
PHASE DISTANCE Z4: Function	Enabled
PHASE DISTANCE Z4: Direction	Reverse
PHASE DISTANCE Z4: Shape	Quad
PHASE DISTANCE Z4: Xfmr Vol Connection	None
PHASE DISTANCE Z4: Xfmr Curr Connection	None
PHASE DISTANCE Z4: Reach	12.50 ohms
PHASE DISTANCE Z4: RCA	90 deg
PHASE DISTANCE Z4: Rev Reach	0.02 ohms
PHASE DISTANCE Z4: Rev Reach RCA	78 deg
PHASE DISTANCE Z4: Comp Limit	90 deg
PHASE DISTANCE Z4: DIR RCA	49 deg
PHASE DISTANCE Z4: DIR Comp Limit	71 deg
PHASE DISTANCE Z4: Quad Right Blinder	12.50 ohms
PHASE DISTANCE Z4: Quad Right Blinder RCA	78 deg
PHASE DISTANCE Z4: Quad Left Blinder	12.50 ohms
PHASE DISTANCE Z4: Quad Left Blinder RCA	78 deg
PHASE DISTANCE Z4: Supervision	0.100 pu
PHASE DISTANCE Z4: Volt Level	0.000 pu
PHASE DISTANCE Z4: Delay	2.500 s
PHASE DISTANCE Z4: Block	Load encroch On (VO30)
PHASE DISTANCE Z4: Target	Self-reset
PHASE DISTANCE Z4: Events	Enabled
PHASE DISTANCE Z5: Function	Enabled
PHASE DISTANCE Z5: Direction	Forward
PHASE DISTANCE Z5: Shape	Quad
PHASE DISTANCE Z5: Xfmr Vol Connection	None

RANCAGUA_LIAAJAH2_A1_S2_140527.URS
Y:\CRAP\ARCHIVOS DE CONFIGURACIÝN\04_OCS\RANCAGUA
DEVICE DEFINITION
FILES
ORDER CODE: D60-G00-HCL-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

PHASE DISTANCE [GROUP 1] (continued from last page)

PHASE DISTANCE Z5: Xfmr Curr Connection	None
PHASE DISTANCE Z5: Reach	13.00 ohms
PHASE DISTANCE Z5: RCA	90 deg
PHASE DISTANCE Z5: Rev Reach	0.02 ohms
PHASE DISTANCE Z5: Rev Reach RCA	78 deg
PHASE DISTANCE Z5: Comp Limit	90 deg
PHASE DISTANCE Z5: DIR RCA	49 deg
PHASE DISTANCE Z5: DIR Comp Limit	71 deg
PHASE DISTANCE Z5: Quad Right Blinder	13.00 ohms
PHASE DISTANCE Z5: Quad Right Blinder RCA	78 deg
PHASE DISTANCE Z5: Quad Left Blinder	13.00 ohms
PHASE DISTANCE Z5: Quad Left Blinder RCA	78 deg
PHASE DISTANCE Z5: Supervision	0.100 pu
PHASE DISTANCE Z5: Volt Level	0.000 pu
PHASE DISTANCE Z5: Delay	1.500 s
PHASE DISTANCE Z5: Block	Load encroch On (VO30)
PHASE DISTANCE Z5: Target	Self-reset
PHASE DISTANCE Z5: Events	Enabled

GROUND DISTANCE [GROUP 1]

GROUND DISTANCE Z1: Function	Enabled
GROUND DISTANCE Z1: Direction	Forward
GROUND DISTANCE Z1: Shape	Quad
GROUND DISTANCE Z1: Z0/Z1 Mag	3.21
GROUND DISTANCE Z1: Z0/Z1 Ang	2 deg
GROUND DISTANCE Z1: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z1: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z1: Reach	2.74 ohms
GROUND DISTANCE Z1: RCA	90 deg
GROUND DISTANCE Z1: Rev Reach	0.02 ohms
GROUND DISTANCE Z1: Rev Reach RCA	78 deg
GROUND DISTANCE Z1: POL Current	Zero-seq
GROUND DISTANCE Z1: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z1: Comp Limit	90 deg
GROUND DISTANCE Z1: DIR RCA	49 deg
GROUND DISTANCE Z1: DIR Comp Limit	71 deg
GROUND DISTANCE Z1: Quad Right Blinder	2.74 ohms
GROUND DISTANCE Z1: Quad Right Blinder RCA	78 deg
GROUND DISTANCE Z1: Quad Left Blinder	2.74 ohms
GROUND DISTANCE Z1: Quad Left Blinder RCA	78 deg
GROUND DISTANCE Z1: Supervision	0.100 pu
GROUND DISTANCE Z1: Volt Level	0.000 pu
GROUND DISTANCE Z1: Delay	0.000 s
GROUND DISTANCE Z1: Block	BLQ Zonas PH On (VO1)
GROUND DISTANCE Z1: Target	Self-reset
GROUND DISTANCE Z1: Events	Enabled
GROUND DISTANCE Z2: Function	Enabled
GROUND DISTANCE Z2: Direction	Forward
GROUND DISTANCE Z2: Shape	Quad
GROUND DISTANCE Z2: Z0/Z1 Mag	3.21
GROUND DISTANCE Z2: Z0/Z1 Ang	2 deg
GROUND DISTANCE Z2: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z2: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z2: Reach	25.68 ohms
GROUND DISTANCE Z2: RCA	90 deg
GROUND DISTANCE Z2: Rev Reach	0.02 ohms
GROUND DISTANCE Z2: Rev Reach RCA	78 deg
GROUND DISTANCE Z2: POL Current	Zero-seq
GROUND DISTANCE Z2: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z2: Comp Limit	90 deg
GROUND DISTANCE Z2: DIR RCA	49 deg
GROUND DISTANCE Z2: DIR Comp Limit	71 deg
GROUND DISTANCE Z2: Quad Right Blinder	21.00 ohms
GROUND DISTANCE Z2: Quad Right Blinder RCA	78 deg
GROUND DISTANCE Z2: Quad Left Blinder	21.00 ohms
GROUND DISTANCE Z2: Quad Left Blinder RCA	78 deg
GROUND DISTANCE Z2: Supervision	0.100 pu
GROUND DISTANCE Z2: Volt Level	0.000 pu
GROUND DISTANCE Z2: Delay	65.535 s

RANCAGUA_LIAAJAH2_A1_S2_140527.URS
Y:\CRAP\ARCHIVOS DE CONFIGURACIÝN\04_OCS\RANCAGUA
DEVICE DEFINITION
FILES
ORDER CODE: D60-G00-HCL-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

GROUND DISTANCE [GROUP 1] (continued from last page)

GROUND DISTANCE Z2: Block	Load encroch On (VO30)
GROUND DISTANCE Z2: Target	Self-reset
GROUND DISTANCE Z2: Events	Enabled
GROUND DISTANCE Z3: Function	Enabled
GROUND DISTANCE Z3: Direction	Forward
GROUND DISTANCE Z3: Shape	Quad
GROUND DISTANCE Z3: Z0/Z1 Mag	3.21
GROUND DISTANCE Z3: Z0/Z1 Ang	2 deg
GROUND DISTANCE Z3: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z3: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z3: Reach	5.52 ohms
GROUND DISTANCE Z3: RCA	90 deg
GROUND DISTANCE Z3: Rev Reach	0.02 ohms
GROUND DISTANCE Z3: Rev Reach RCA	78 deg
GROUND DISTANCE Z3: POL Current	Zero-seq
GROUND DISTANCE Z3: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z3: Comp Limit	90 deg
GROUND DISTANCE Z3: DIR RCA	49 deg
GROUND DISTANCE Z3: DIR Comp Limit	71 deg
GROUND DISTANCE Z3: Quad Right Blinder	5.52 ohms
GROUND DISTANCE Z3: Quad Right Blinder RCA	78 deg
GROUND DISTANCE Z3: Quad Left Blinder	5.52 ohms
GROUND DISTANCE Z3: Quad Left Blinder RCA	78 deg
GROUND DISTANCE Z3: Supervision	0.100 pu
GROUND DISTANCE Z3: Volt Level	0.000 pu
GROUND DISTANCE Z3: Delay	0.600 s
GROUND DISTANCE Z3: Block	BLQ Zonas PH On (VO1)
GROUND DISTANCE Z3: Target	Self-reset
GROUND DISTANCE Z3: Events	Enabled
GROUND DISTANCE Z4: Function	Enabled
GROUND DISTANCE Z4: Direction	Reverse
GROUND DISTANCE Z4: Shape	Quad
GROUND DISTANCE Z4: Z0/Z1 Mag	3.21
GROUND DISTANCE Z4: Z0/Z1 Ang	2 deg
GROUND DISTANCE Z4: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z4: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z4: Reach	12.50 ohms
GROUND DISTANCE Z4: RCA	90 deg
GROUND DISTANCE Z4: Rev Reach	0.02 ohms
GROUND DISTANCE Z4: Rev Reach RCA	78 deg
GROUND DISTANCE Z4: POL Current	Zero-seq
GROUND DISTANCE Z4: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z4: Comp Limit	90 deg
GROUND DISTANCE Z4: DIR RCA	49 deg
GROUND DISTANCE Z4: DIR Comp Limit	71 deg
GROUND DISTANCE Z4: Quad Right Blinder	12.50 ohms
GROUND DISTANCE Z4: Quad Right Blinder RCA	78 deg
GROUND DISTANCE Z4: Quad Left Blinder	12.50 ohms
GROUND DISTANCE Z4: Quad Left Blinder RCA	78 deg
GROUND DISTANCE Z4: Supervision	0.100 pu
GROUND DISTANCE Z4: Volt Level	0.000 pu
GROUND DISTANCE Z4: Delay	2.500 s
GROUND DISTANCE Z4: Block	Load encroch On (VO30)
GROUND DISTANCE Z4: Target	Self-reset
GROUND DISTANCE Z4: Events	Enabled
GROUND DISTANCE Z5: Function	Enabled
GROUND DISTANCE Z5: Direction	Forward
GROUND DISTANCE Z5: Shape	Quad
GROUND DISTANCE Z5: Z0/Z1 Mag	3.21
GROUND DISTANCE Z5: Z0/Z1 Ang	2 deg
GROUND DISTANCE Z5: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z5: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z5: Reach	13.00 ohms
GROUND DISTANCE Z5: RCA	90 deg
GROUND DISTANCE Z5: Rev Reach	0.02 ohms
GROUND DISTANCE Z5: Rev Reach RCA	78 deg
GROUND DISTANCE Z5: POL Current	Zero-seq
GROUND DISTANCE Z5: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z5: Comp Limit	90 deg

RANCAGUA_LIAAJAH2_A1_S2_140527.URS
Y:\CRAP\ARCHIVOS DE CONFIGURACIÝN\04_OCS\RANCAGUA
DEVICE DEFINITION
FILES
ORDER CODE: D60-G00-HCL-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

GROUND DISTANCE [GROUP 1] (continued from last page)

GROUND DISTANCE Z5: DIR RCA	49 deg
GROUND DISTANCE Z5: DIR Comp Limit	71 deg
GROUND DISTANCE Z5: Quad Right Blinder	13.00 ohms
GROUND DISTANCE Z5: Quad Right Blinder RCA	78 deg
GROUND DISTANCE Z5: Quad Left Blinder	13.00 ohms
GROUND DISTANCE Z5: Quad Left Blinder RCA	78 deg
GROUND DISTANCE Z5: Supervision	0.100 pu
GROUND DISTANCE Z5: Volt Level	0.000 pu
GROUND DISTANCE Z5: Delay	1.500 s
GROUND DISTANCE Z5: Block	Load encroch On (VO30)
GROUND DISTANCE Z5: Target	Self-reset
GROUND DISTANCE Z5: Events	Enabled

POWER SWING DETECT [GROUP 1]

Function	Enabled
Source	LINEA (SRC 1)
Shape	Quad Shape
Mode	Two Step
Supv	0.200 pu
Fwd Reach	17.50 ohms
Quad Fwd Mid	18.20 ohms
Quad Fwd Out	18.20 ohms
Fwd Rca	78 deg
Rev Reach	16.50 ohms
Quad Rev Mid	17.20 ohms
Quad Rev Out	17.20 ohms
Rev Rca	78 deg
Outer Limit Angle	85 deg
Middle Limit Angle	90 deg
Inner Limit Angle	60 deg
Outer Rgt Bld	15.20 ohms
Outer Lft Bld	14.20 ohms
Midle Rgt Bld	15.20 ohms
Midle Lft Bld	14.20 ohms
Inner Rgt Bld	14.50 ohms
Inner Lft Bld	13.50 ohms
Delay 1 Pickup	0.020 s
Delay 1 Reset	0.050 s
Delay 2 Pickup	0.017 s
Delay 3 Pickup	0.009 s
Delay 4 Pickup	0.017 s
Seal-In Delay	0.000 s
Trip Mode	Delayed
Block	NEUTRAL TOC1 PKP
Target	Self-reset
Event	Enabled

LOAD ENCROACHMENT [GROUP 1]

Function	Enabled
Source	LINEA (SRC 1)
Min Volt	0.800 pu
Reach	9.14 ohms
Angle	35 deg
Pickup Delay	0.000 s
Reset Delay	0.000 s
Block	OFF
Target	Disabled
Events	Enabled

PHASE CURRENT

PHASE TOC [GROUP 1]

PHASE TOC1: Function	Enabled
PHASE TOC1: Signal Source	LINEA (SRC 1)
PHASE TOC1: Input	Phasor
PHASE TOC1: Pickup	1.200 pu
PHASE TOC1: Curve	IEC Curve A
PHASE TOC1: TD Multiplier	0.15
PHASE TOC1: Reset	Instantaneous
PHASE TOC1: Voltage Restraint	Disabled

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Y:\CRAP\ARCHIVOS DE CONFIGURACIÝN\04_OCS\RANCAGUA
DEVICE DEFINITION
FILES
ORDER CODE: D60-G00-HCL-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

PHASE TOC [GROUP 1] (continued from last page)

PHASE TOC1: Block A	BLOQ 51 On (VO31)
PHASE TOC1: Block B	BLOQ 51 On (VO31)
PHASE TOC1: Block C	BLOQ 51 On (VO31)
PHASE TOC1: Target	Self-reset
PHASE TOC1: Events	Enabled

PHASE DIRECTIONAL [GROUP 1]

PHASE DIR1: Function	Enabled
PHASE DIR1: Source	LINEA (SRC 1)
PHASE DIR1: Block	OFF
PHASE DIR1: ECA	45 deg
PHASE DIR1: Pol V Threshold	0.700 pu
PHASE DIR1: Block when V Mem Exp	No
PHASE DIR1: Target	Self-reset
PHASE DIR1: Events	Enabled

NEUTRAL CURRENT

NEUTRAL TOC [GROUP 1]

NEUTRAL TOC1: Function	Enabled
NEUTRAL TOC1: Source	LINEA (SRC 1)
NEUTRAL TOC1: Input	Phasor
NEUTRAL TOC1: Pickup	0.050 pu
NEUTRAL TOC1: Curve	IEC Curve A
NEUTRAL TOC1: TD Multiplier	0.40
NEUTRAL TOC1: Reset	Instantaneous
NEUTRAL TOC1: Block	NEG SEQ DIR OC1 REV
NEUTRAL TOC1: Target	Self-reset
NEUTRAL TOC1: Events	Enabled

NEGATIVE SEQUENCE CURRENT

NEGATIVE SEQUENCE DIRECTIONAL OC [GROUP 1]

NEGATIVE SEQ DIR OC1: Function	Enabled
NEGATIVE SEQ DIR OC1: Source	LINEA (SRC 1)
NEGATIVE SEQ DIR OC1: Offset	0.00 ohms
NEGATIVE SEQ DIR OC1: Type	Neg Sequence
NEGATIVE SEQ DIR OC1: POS SEQ Restraint	0.000
NEGATIVE SEQ DIR OC1: Forward ECA	80 ° Lag
NEGATIVE SEQ DIR OC1: Forward Limit Angle	80 deg
NEGATIVE SEQ DIR OC1: Forward Pickup	0.10 pu
NEGATIVE SEQ DIR OC1: Reverse Limit Angle	80 deg
NEGATIVE SEQ DIR OC1: Reverse Pickup	0.10 pu
NEGATIVE SEQ DIR OC1: Block	SRC1 VT FUSE FAIL OP
NEGATIVE SEQ DIR OC1: Target	Self-reset
NEGATIVE SEQ DIR OC1: Events	Enabled

BREAKER FAILURE [GROUP 1]

BF1: Function	Enabled
BF1: Mode	3-Pole
BF1: Source	LINEA (SRC 1)
BF1: Current Supervision	Yes
BF1: Use Seal-In	Yes
BF1: Three Pole Initiate	TRIP 3-POLE
BF1: Block	OFF
BF1: Phase Current Supv Pickup	1.200 pu
BF1: Neutral Current Supv Pickup	0.416 pu
BF1: Use Timer 1	Yes
BF1: Timer 1 Pickup Delay	0.200 s
BF1: Use Timer 2	No
BF1: Timer 2 Pickup Delay	0.200 s
BF1: Use Timer 3	No
BF1: Timer 3 Pickup Delay	0.000 s
BF1: Breaker Pos1 Phase A/3P	52A1 (a) On(H8c)
BF1: Breaker Pos2 Phase A/3P	OFF
BF1: Breaker Test On	OFF
BF1: Phase Current HiSet Pickup	1.200 pu
BF1: Neutral Current HiSet Pickup	0.416 pu
BF1: Phase Current LoSet Pickup	1.200 pu
BF1: Neutral Current LoSet Pickup	0.416 pu
BF1: LoSet Time Delay	0.000 s

RANCAGUA_LIAAJAH2_A1_S2_140527.URS
Y:\CRAP\ARCHIVOS DE CONFIGURACIÝN\04_OCS\RANCAGUA
DEVICE DEFINITION
FILES
ORDER CODE: D60-G00-HCL-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

BREAKER FAILURE [GROUP 1] (continued from last page)

BF1: Trip Dropout Delay	0.000 s
BF1: Target	Latched
BF1: Events	Enabled
BF1: Phase A Initiate	OFF
BF1: Phase B Initiate	OFF
BF1: Phase C Initiate	OFF
BF1: Breaker Pos1 Phase B	OFF
BF1: Breaker Pos1 Phase C	OFF
BF1: Breaker Pos2 Phase B	OFF
BF1: Breaker Pos2 Phase C	OFF

GROUP 2

LINE PICKUP [GROUP 2]

Function	Enabled
Signal Source	LINEA (SRC 1)
Phase IOC Line Pickup	2.500 pu
UV Pickup	0.800 pu
Line End Open Pickup Delay	0.000 s
Line End Open Reset Delay	0.200 s
OV Pickup Delay	0.200 s
Autoreclose Coordination Bypass	Disabled
Autoreclose Coordination Pickup Delay	0.045 s
Autoreclose Coordination Reset Delay	0.005 s
Terminal Open	BREAKER 1 OPEN
AR Accelerate	OFF
Block	OFF
Target	Self-reset
Events	Enabled

DISTANCE

DISTANCE [GROUP 2]

Source	LINEA (SRC 1)
Memory Duration	10 cycles
Force Self-Polar	OFF
Force Mem-Polar	OFF

PHASE DISTANCE [GROUP 2]

PHASE DISTANCE Z1: Function	Enabled
PHASE DISTANCE Z1: Direction	Forward
PHASE DISTANCE Z1: Shape	Quad
PHASE DISTANCE Z1: Xfmr Vol Connection	None
PHASE DISTANCE Z1: Xfmr Curr Connection	None
PHASE DISTANCE Z1: Reach	1.72 ohms
PHASE DISTANCE Z1: RCA	90 deg
PHASE DISTANCE Z1: Rev Reach	1.72 ohms
PHASE DISTANCE Z1: Rev Reach RCA	79 deg
PHASE DISTANCE Z1: Comp Limit	90 deg
PHASE DISTANCE Z1: DIR RCA	45 deg
PHASE DISTANCE Z1: DIR Comp Limit	79 deg
PHASE DISTANCE Z1: Quad Right Blinder	1.72 ohms
PHASE DISTANCE Z1: Quad Right Blinder RCA	79 deg
PHASE DISTANCE Z1: Quad Left Blinder	10.00 ohms
PHASE DISTANCE Z1: Quad Left Blinder RCA	79 deg
PHASE DISTANCE Z1: Supervision	0.200 pu
PHASE DISTANCE Z1: Volt Level	0.000 pu
PHASE DISTANCE Z1: Delay	0.000 s
PHASE DISTANCE Z1: Block	BLQ Zonas PH On (VO1)
PHASE DISTANCE Z1: Target	Self-reset
PHASE DISTANCE Z1: Events	Enabled
PHASE DISTANCE Z2: Function	Enabled
PHASE DISTANCE Z2: Direction	Forward
PHASE DISTANCE Z2: Shape	Quad
PHASE DISTANCE Z2: Xfmr Vol Connection	None
PHASE DISTANCE Z2: Xfmr Curr Connection	None
PHASE DISTANCE Z2: Reach	2.90 ohms
PHASE DISTANCE Z2: RCA	90 deg
PHASE DISTANCE Z2: Rev Reach	2.90 ohms
PHASE DISTANCE Z2: Rev Reach RCA	79 deg
PHASE DISTANCE Z2: Comp Limit	90 deg

RANCAGUA_LIAAJAH2_A1_S2_140527.URS
Y:\CRAP\ARCHIVOS DE CONFIGURACIÝN\04_OCS\RANCAGUA
DEVICE DEFINITION
FILES
ORDER CODE: D60-G00-HCL-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

PHASE DISTANCE [GROUP 2] (continued from last page)

PHASE DISTANCE Z2: DIR RCA	45 deg
PHASE DISTANCE Z2: DIR Comp Limit	79 deg
PHASE DISTANCE Z2: Quad Right Blinder	2.90 ohms
PHASE DISTANCE Z2: Quad Right Blinder RCA	79 deg
PHASE DISTANCE Z2: Quad Left Blinder	10.00 ohms
PHASE DISTANCE Z2: Quad Left Blinder RCA	79 deg
PHASE DISTANCE Z2: Supervision	0.200 pu
PHASE DISTANCE Z2: Volt Level	0.000 pu
PHASE DISTANCE Z2: Delay	0.400 s
PHASE DISTANCE Z2: Block	BLQ Zonas PH On (VO1)
PHASE DISTANCE Z2: Target	Self-reset
PHASE DISTANCE Z2: Events	Enabled
PHASE DISTANCE Z3: Function	Enabled
PHASE DISTANCE Z3: Direction	Forward
PHASE DISTANCE Z3: Shape	Quad
PHASE DISTANCE Z3: Xfmr Vol Connection	None
PHASE DISTANCE Z3: Xfmr Curr Connection	None
PHASE DISTANCE Z3: Reach	5.50 ohms
PHASE DISTANCE Z3: RCA	90 deg
PHASE DISTANCE Z3: Rev Reach	5.50 ohms
PHASE DISTANCE Z3: Rev Reach RCA	79 deg
PHASE DISTANCE Z3: Comp Limit	90 deg
PHASE DISTANCE Z3: DIR RCA	45 deg
PHASE DISTANCE Z3: DIR Comp Limit	79 deg
PHASE DISTANCE Z3: Quad Right Blinder	5.50 ohms
PHASE DISTANCE Z3: Quad Right Blinder RCA	79 deg
PHASE DISTANCE Z3: Quad Left Blinder	10.00 ohms
PHASE DISTANCE Z3: Quad Left Blinder RCA	79 deg
PHASE DISTANCE Z3: Supervision	0.200 pu
PHASE DISTANCE Z3: Volt Level	0.000 pu
PHASE DISTANCE Z3: Delay	2.000 s
PHASE DISTANCE Z3: Block	BLQ Zonas PH On (VO1)
PHASE DISTANCE Z3: Target	Self-reset
PHASE DISTANCE Z3: Events	Enabled
PHASE DISTANCE Z4: Function	Enabled
PHASE DISTANCE Z4: Direction	Reverse
PHASE DISTANCE Z4: Shape	Quad
PHASE DISTANCE Z4: Xfmr Vol Connection	None
PHASE DISTANCE Z4: Xfmr Curr Connection	None
PHASE DISTANCE Z4: Reach	2.00 ohms
PHASE DISTANCE Z4: RCA	90 deg
PHASE DISTANCE Z4: Rev Reach	2.00 ohms
PHASE DISTANCE Z4: Rev Reach RCA	79 deg
PHASE DISTANCE Z4: Comp Limit	90 deg
PHASE DISTANCE Z4: DIR RCA	45 deg
PHASE DISTANCE Z4: DIR Comp Limit	79 deg
PHASE DISTANCE Z4: Quad Right Blinder	2.00 ohms
PHASE DISTANCE Z4: Quad Right Blinder RCA	79 deg
PHASE DISTANCE Z4: Quad Left Blinder	10.00 ohms
PHASE DISTANCE Z4: Quad Left Blinder RCA	79 deg
PHASE DISTANCE Z4: Supervision	0.200 pu
PHASE DISTANCE Z4: Volt Level	0.000 pu
PHASE DISTANCE Z4: Delay	2.000 s
PHASE DISTANCE Z4: Block	BLQ Zonas PH On (VO1)
PHASE DISTANCE Z4: Target	Self-reset
PHASE DISTANCE Z4: Events	Enabled

GROUND DISTANCE [GROUP 2]

GROUND DISTANCE Z2: Function	Enabled
GROUND DISTANCE Z2: Direction	Forward
GROUND DISTANCE Z2: Shape	Quad
GROUND DISTANCE Z2: Z0/Z1 Mag	3.36
GROUND DISTANCE Z2: Z0/Z1 Ang	1 deg
GROUND DISTANCE Z2: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z2: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z2: Reach	2.90 ohms
GROUND DISTANCE Z2: RCA	90 deg
GROUND DISTANCE Z2: Rev Reach	2.90 ohms
GROUND DISTANCE Z2: Rev Reach RCA	79 deg

RANCAGUA_LIAAJAH2_A1_S2_140527.URS
Y:\CRAP\ARCHIVOS DE CONFIGURACIÝN\04_OCS\RANCAGUA
DEVICE DEFINITION
FILES
ORDER CODE: D60-G00-HCL-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

GROUND DISTANCE [GROUP 2] (continued from last page)

GROUND DISTANCE Z2: POL Current	Zero-seq
GROUND DISTANCE Z2: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z2: Comp Limit	90 deg
GROUND DISTANCE Z2: DIR RCA	45 deg
GROUND DISTANCE Z2: DIR Comp Limit	79 deg
GROUND DISTANCE Z2: Quad Right Blinder	5.80 ohms
GROUND DISTANCE Z2: Quad Right Blinder RCA	79 deg
GROUND DISTANCE Z2: Quad Left Blinder	5.80 ohms
GROUND DISTANCE Z2: Quad Left Blinder RCA	79 deg
GROUND DISTANCE Z2: Supervision	0.100 pu
GROUND DISTANCE Z2: Volt Level	0.000 pu
GROUND DISTANCE Z2: Delay	0.400 s
GROUND DISTANCE Z2: Block	BLQ Zonas PH On (VO1)
GROUND DISTANCE Z2: Target	Self-reset
GROUND DISTANCE Z2: Events	Enabled
GROUND DISTANCE Z3: Function	Enabled
GROUND DISTANCE Z3: Direction	Forward
GROUND DISTANCE Z3: Shape	Quad
GROUND DISTANCE Z3: Z0/Z1 Mag	3.36
GROUND DISTANCE Z3: Z0/Z1 Ang	1 deg
GROUND DISTANCE Z3: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z3: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z3: Reach	5.50 ohms
GROUND DISTANCE Z3: RCA	90 deg
GROUND DISTANCE Z3: Rev Reach	5.50 ohms
GROUND DISTANCE Z3: Rev Reach RCA	79 deg
GROUND DISTANCE Z3: POL Current	Zero-seq
GROUND DISTANCE Z3: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z3: Comp Limit	90 deg
GROUND DISTANCE Z3: DIR RCA	45 deg
GROUND DISTANCE Z3: DIR Comp Limit	79 deg
GROUND DISTANCE Z3: Quad Right Blinder	11.00 ohms
GROUND DISTANCE Z3: Quad Right Blinder RCA	79 deg
GROUND DISTANCE Z3: Quad Left Blinder	11.00 ohms
GROUND DISTANCE Z3: Quad Left Blinder RCA	79 deg
GROUND DISTANCE Z3: Supervision	0.100 pu
GROUND DISTANCE Z3: Volt Level	0.000 pu
GROUND DISTANCE Z3: Delay	2.000 s
GROUND DISTANCE Z3: Block	BLQ Zonas PH On (VO1)
GROUND DISTANCE Z3: Target	Self-reset
GROUND DISTANCE Z3: Events	Enabled
GROUND DISTANCE Z4: Function	Enabled
GROUND DISTANCE Z4: Direction	Reverse
GROUND DISTANCE Z4: Shape	Quad
GROUND DISTANCE Z4: Z0/Z1 Mag	3.36
GROUND DISTANCE Z4: Z0/Z1 Ang	1 deg
GROUND DISTANCE Z4: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z4: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z4: Reach	2.00 ohms
GROUND DISTANCE Z4: RCA	90 deg
GROUND DISTANCE Z4: Rev Reach	2.00 ohms
GROUND DISTANCE Z4: Rev Reach RCA	79 deg
GROUND DISTANCE Z4: POL Current	Zero-seq
GROUND DISTANCE Z4: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z4: Comp Limit	90 deg
GROUND DISTANCE Z4: DIR RCA	45 deg
GROUND DISTANCE Z4: DIR Comp Limit	79 deg
GROUND DISTANCE Z4: Quad Right Blinder	4.00 ohms
GROUND DISTANCE Z4: Quad Right Blinder RCA	79 deg
GROUND DISTANCE Z4: Quad Left Blinder	4.00 ohms
GROUND DISTANCE Z4: Quad Left Blinder RCA	79 deg
GROUND DISTANCE Z4: Supervision	0.100 pu
GROUND DISTANCE Z4: Volt Level	0.000 pu
GROUND DISTANCE Z4: Delay	2.000 s
GROUND DISTANCE Z4: Block	BLQ Zonas PH On (VO1)
GROUND DISTANCE Z4: Target	Self-reset
GROUND DISTANCE Z4: Events	Enabled

POWER SWING DETECT [GROUP 2]

RANCAGUA_LIAAJAH2_A1_S2_140527.URS
Y:\CRAP\ARCHIVOS DE CONFIGURACIÝN\04_OCS\RANCAGUA
DEVICE DEFINITION
FILES
ORDER CODE: D60-G00-HCL-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

POWER SWING DETECT [GROUP 2] (continued from last page)

Function	Enabled
Source	LINEA (SRC 1)
Shape	Quad Shape
Mode	Two Step
Supv	0.200 pu
Fwd Reach	7.50 ohms
Quad Fwd Mid	9.50 ohms
Quad Fwd Out	9.50 ohms
Fwd Rca	79 deg
Rev Reach	4.30 ohms
Quad Rev Mid	6.30 ohms
Quad Rev Out	6.30 ohms
Rev Rca	90 deg
Outer Limit Angle	120 deg
Middle Limit Angle	120 deg
Inner Limit Angle	79 deg
Outer Rgt Bld	9.20 ohms
Outer Lft Bld	7.71 ohms
Midle Rgt Bld	9.20 ohms
Midle Lft Bld	7.71 ohms
Inner Rgt Bld	7.20 ohms
Inner Lft Bld	5.71 ohms
Delay 1 Pickup	0.001 s
Delay 1 Reset	0.050 s
Delay 2 Pickup	0.017 s
Delay 3 Pickup	0.009 s
Delay 4 Pickup	0.017 s
Seal-In Delay	0.400 s
Trip Mode	Delayed
Block	NEUTRAL TOC1 PKP
Target	Self-reset
Event	Enabled

PHASE CURRENT

PHASE TOC [GROUP 2]

PHASE TOC1: Function	Enabled
PHASE TOC1: Signal Source	LINEA (SRC 1)
PHASE TOC1: Input	Phasor
PHASE TOC1: Pickup	0.690 pu
PHASE TOC1: Curve	IEC Curve A
PHASE TOC1: TD Multiplier	0.15
PHASE TOC1: Reset	Instantaneous
PHASE TOC1: Voltage Restraint	Disabled
PHASE TOC1: Block A	BLOQ 51 On (VO31)
PHASE TOC1: Block B	BLOQ 51 On (VO31)
PHASE TOC1: Block C	BLOQ 51 On (VO31)
PHASE TOC1: Target	Self-reset
PHASE TOC1: Events	Enabled

PHASE IOC [GROUP 2]

PHASE IOC1: Function	Enabled
PHASE IOC1: Source	LINEA (SRC 1)
PHASE IOC1: Pickup	1.800 pu
PHASE IOC1: Delay	0.01 s
PHASE IOC1: Reset Delay	0.00 s
PHASE IOC1: Block A	BLOQ 51 On (VO31)
PHASE IOC1: Block B	BLOQ 51 On (VO31)
PHASE IOC1: Block C	BLOQ 51 On (VO31)
PHASE IOC1: Target	Self-reset
PHASE IOC1: Events	Enabled

NEUTRAL CURRENT

NEUTRAL TOC [GROUP 2]

NEUTRAL TOC1: Function	Enabled
NEUTRAL TOC1: Source	LINEA (SRC 1)
NEUTRAL TOC1: Input	Phasor
NEUTRAL TOC1: Pickup	0.280 pu
NEUTRAL TOC1: Curve	IEC Curve A
NEUTRAL TOC1: TD Multiplier	0.14

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ORDER CODE: D60-G00-HCL-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

NEUTRAL TOC [GROUP 2] (continued from last page)

NEUTRAL TOC1: Reset	Instantaneous
NEUTRAL TOC1: Block	NEG SEQ DIR OC1 REV
NEUTRAL TOC1: Target	Latched
NEUTRAL TOC1: Events	Enabled

NEUTRAL IOC [GROUP 2]

NEUTRAL IOC1: Function	Enabled
NEUTRAL IOC1: Source	LINEA (SRC 1)
NEUTRAL IOC1: Pickup	1.800 pu
NEUTRAL IOC1: Delay	0.03 s
NEUTRAL IOC1: Reset Delay	0.00 s
NEUTRAL IOC1: Block	NTRL DIR OC1 REV
NEUTRAL IOC1: Target	Self-reset
NEUTRAL IOC1: Events	Enabled

NEGATIVE SEQUENCE CURRENT
NEGATIVE SEQUENCE DIRECTIONAL OC [GROUP 2]

NEGATIVE SEQ DIR OC1: Function	Enabled
NEGATIVE SEQ DIR OC1: Source	LINEA (SRC 1)
NEGATIVE SEQ DIR OC1: Offset	0.00 ohms
NEGATIVE SEQ DIR OC1: Type	Neg Sequence
NEGATIVE SEQ DIR OC1: POS SEQ Restraint	0.000
NEGATIVE SEQ DIR OC1: Forward ECA	81 ° Lag
NEGATIVE SEQ DIR OC1: Forward Limit Angle	80 deg
NEGATIVE SEQ DIR OC1: Forward Pickup	0.10 pu
NEGATIVE SEQ DIR OC1: Reverse Limit Angle	81 deg
NEGATIVE SEQ DIR OC1: Reverse Pickup	0.10 pu
NEGATIVE SEQ DIR OC1: Block	SRC1 VT FUSE FAIL OP
NEGATIVE SEQ DIR OC1: Target	Self-reset
NEGATIVE SEQ DIR OC1: Events	Enabled

BREAKER FAILURE [GROUP 2]

BF1: Function	Enabled
BF1: Mode	3-Pole
BF1: Source	LINEA (SRC 1)
BF1: Current Supervision	Yes
BF1: Use Seal-In	No
BF1: Three Pole Initiate	TRIP 3-POLE
BF1: Block	OFF
BF1: Phase Current Supv Pickup	1.200 pu
BF1: Neutral Current Supv Pickup	0.280 pu
BF1: Use Timer 1	Yes
BF1: Timer 1 Pickup Delay	0.200 s
BF1: Use Timer 2	No
BF1: Timer 2 Pickup Delay	0.000 s
BF1: Use Timer 3	No
BF1: Timer 3 Pickup Delay	0.000 s
BF1: Breaker Pos1 Phase A/3P	52A1 (a) On(H8c)
BF1: Breaker Pos2 Phase A/3P	OFF
BF1: Breaker Test On	OFF
BF1: Phase Current HiSet Pickup	1.200 pu
BF1: Neutral Current HiSet Pickup	0.280 pu
BF1: Phase Current LoSet Pickup	1.200 pu
BF1: Neutral Current LoSet Pickup	0.280 pu
BF1: LoSet Time Delay	0.000 s
BF1: Trip Dropout Delay	0.000 s
BF1: Target	Self-reset
BF1: Events	Enabled
BF1: Phase A Initiate	OFF
BF1: Phase B Initiate	OFF
BF1: Phase C Initiate	OFF
BF1: Breaker Pos1 Phase B	OFF
BF1: Breaker Pos1 Phase C	OFF
BF1: Breaker Pos2 Phase B	OFF
BF1: Breaker Pos2 Phase C	OFF

CONTROL ELEMENTS
SETTING GROUPS

Function	Enabled

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DEVICE DEFINITION
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VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

SETTING GROUPS (continued from last page)

Block	OFF
Group 2 Activate On	LATCH 1 ON
Group 3 Activate On	OFF
Group 4 Activate On	OFF
Group 5 Activate On	OFF
Group 6 Activate On	OFF
Group 1 Name	
Group 2 Name	
Group 3 Name	
Group 4 Name	
Group 5 Name	
Group 6 Name	
Events	Disabled

TRIP OUTPUT

Trip Mode	3 Pole Only
Trip 3-Pole Input1	TRIP GRAL On (VO2)
Trip 3-Pole Input2	OFF
Trip 3-Pole Input3	OFF
Trip 3-Pole Input4	OFF
Trip 3-Pole Input5	OFF
Trip 3-Pole Input6	OFF
Trip 1-Pole Input1	OFF
Trip 1-Pole Input2	OFF
Trip 1-Pole Input3	OFF
Trip 1-Pole Input4	OFF
Trip 1-Pole Input5	OFF
Trip 1-Pole Input6	OFF
Trip Reclose Input1	GND DIST Z1 OP
Trip Reclose Input2	PH DIST Z1 OP
Trip Reclose Input3	HYBRID POTT OP
Trip Reclose Input4	OFF
Trip Reclose Input5	OFF
Trip Reclose Input6	OFF
BKR Phase A Open	LINE PICKUP I<A
BKR Phase B Open	LINE PICKUP I<B
BKR Phase C Open	LINE PICKUP I<C
Trip Force 3-Pole	OFF
Trip Pilot Priority	0.000 s
Reverse Fault	OFF
Trip Delay On Evolving Faults	0.000 s
Trip Events	Enabled

MONITORING ELEMENTS

BREAKER ARCING CURRENT

BREAKER 1 ARC: Function	Enabled
BREAKER 1 ARC: Source	LINEA (SRC 1)
BREAKER 1 ARC: Init A	TRIP 3-POLE
BREAKER 1 ARC: Init B	TRIP 3-POLE
BREAKER 1 ARC: Init C	TRIP 3-POLE
BREAKER 1 ARC: Delay	0.000 s
BREAKER 1 ARC: Limit	1000 kA2-cyc
BREAKER 1 ARC: Block	OFF
BREAKER 1 ARC: Target	Disabled
BREAKER 1 ARC: Events	Disabled

VT FUSE FAILURE

VT FUSE FAILURE 1: Function	Enabled

PILOT SCHEMES

1P HYBRID POTT SCHEME

Function	Enabled
Permissive Echo	Custom
Echo Condition	ECHO 3P On (VO37)
Weak Infeed	Disabled
W/I Condition	OFF
Rx Pickup Delay	0.001 s
Trans Block Pickup Delay	0.030 s
Trans Block Reset Delay	0.150 s

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VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

1P HYBRID POTT SCHEME (continued from last page)

Echo Duration	0.100 s
Echo Lockout	0.250 s
Seal-In Delay	0.000 s
Gnd Dir OC Fwd	OFF
Gnd Dir OC Rev	NTRL DIR OC1 REV
No of Comm Bits	1
Rx1	RECEP 3P On (VO36)
Rx2	OFF
Rx3	OFF
Rx4	OFF
Target	Self-reset
Event	Enabled

AUTORECLOSE 1P

Function	Enabled
Mode	3 Pole - B
Max Number Of Shots	1
Block BKR1	OFF
Close Time BKR1	0.40 s
BKR Man Close	CIERRE MANUA On(W3a)
Blk Time Upon Man Cls	8.00 s
1-P Init	OFF
3-P Init	OFF
3-P TD Init	OFF
Multi P Fault	OFF
BKR 1 Pole Open	OFF
BKR 3 Pole Open	OFF
3-P Dead Time 1	0.40 s
3-P Dead Time 2	0.45 s
3-P Dead Time 3	2.00 s
3-P Dead Time 4	4.00 s
Extend Dead T1	OFF
Dead T1 Extension	0.15 s
Reset	OFF
Reset Time	10.00 s
BKR Closed	OFF
Block	79 off On (VO18)
Pause	OFF
Inc Seq Time	5.00 s
Block BKR2	OFF
Close Time BKR2	0.10 s
Transfer 1 to 2	No
Transfer 2 to 1	No
BKR1 Fail Option	Continue
BKR2 Fail Option	Continue
1-P Dead Time	1.00 s
BKR Sequence	1
Transfer Time	4.00 s
Event	Enabled

INPUTS/OUTPUTS

CONTACT INPUTS

[H7A] Contact Input 1 ID	79 DESCO
[H7A] Contact Input 1 Debounce Time	2.0 ms
[H7A] Contact Input 1 Events	Enabled
[H7C] Contact Input 2 ID	79 conectado
[H7C] Contact Input 2 Debounce Time	2.0 ms
[H7C] Contact Input 2 Events	Enabled
[H8A] Contact Input 3 ID	63-FALLA PRE
[H8A] Contact Input 3 Debounce Time	2.0 ms
[H8A] Contact Input 3 Events	Enabled
[H8C] Contact Input 4 ID	52A1 (a)
[H8C] Contact Input 4 Debounce Time	2.0 ms
[H8C] Contact Input 4 Events	Enabled
[U7A] Contact Input 5 ID	Cont Ip 5
[U7A] Contact Input 5 Debounce Time	2.0 ms
[U7A] Contact Input 5 Events	Disabled
[U7C] Contact Input 6 ID	Cont Ip 6
[U7C] Contact Input 6 Debounce Time	2.0 ms

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VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

CONTACT INPUTS (continued from last page)

[U7C] Contact Input 6 Events	Disabled
[U8A] Contact Input 7 ID	Cont Ip 7
[U8A] Contact Input 7 Debounce Time	2.0 ms
[U8A] Contact Input 7 Events	Disabled
[U8C] Contact Input 8 ID	Cont Ip 8
[U8C] Contact Input 8 Debounce Time	2.0 ms
[U8C] Contact Input 8 Events	Disabled
[W1A] Contact Input 9 ID	RECEP JAHUEL
[W1A] Contact Input 9 Debounce Time	2.0 ms
[W1A] Contact Input 9 Events	Enabled
[W1C] Contact Input 10 ID	RECEP ITAHUE
[W1C] Contact Input 10 Debounce Time	2.0 ms
[W1C] Contact Input 10 Events	Enabled
[W2A] Contact Input 11 ID	52b P. CORTE
[W2A] Contact Input 11 Debounce Time	2.0 ms
[W2A] Contact Input 11 Events	Enabled
[W2C] Contact Input 12 ID	52aP.CORTE
[W2C] Contact Input 12 Debounce Time	2.0 ms
[W2C] Contact Input 12 Events	Enabled
[W3A] Contact Input 13 ID	CIERRE MANUA
[W3A] Contact Input 13 Debounce Time	2.0 ms
[W3A] Contact Input 13 Events	Enabled
[W3C] Contact Input 14 ID	TELE DESCONE
[W3C] Contact Input 14 Debounce Time	2.0 ms
[W3C] Contact Input 14 Events	Disabled
[W4A] Contact Input 15 ID	ITE AC FALLA
[W4A] Contact Input 15 Debounce Time	2.0 ms
[W4A] Contact Input 15 Events	Disabled
[W4C] Contact Input 16 ID	Cont Ip 16
[W4C] Contact Input 16 Debounce Time	2.0 ms
[W4C] Contact Input 16 Events	Disabled
[W5A] Contact Input 17 ID	AUTORI 79
[W5A] Contact Input 17 Debounce Time	2.0 ms
[W5A] Contact Input 17 Events	Disabled
[W5C] Contact Input 18 ID	Cont Ip 18
[W5C] Contact Input 18 Debounce Time	2.0 ms
[W5C] Contact Input 18 Events	Disabled
[W6A] Contact Input 19 ID	Cont Ip 19
[W6A] Contact Input 19 Debounce Time	2.0 ms
[W6A] Contact Input 19 Events	Disabled
[W6C] Contact Input 20 ID	Cont Ip 20
[W6C] Contact Input 20 Debounce Time	2.0 ms
[W6C] Contact Input 20 Events	Disabled
[W7A] Contact Input 21 ID	Cont Ip 21
[W7A] Contact Input 21 Debounce Time	2.0 ms
[W7A] Contact Input 21 Events	Disabled
[W7C] Contact Input 22 ID	Cont Ip 22
[W7C] Contact Input 22 Debounce Time	2.0 ms
[W7C] Contact Input 22 Events	Disabled
[W8A] Contact Input 23 ID	Cont Ip 23
[W8A] Contact Input 23 Debounce Time	2.0 ms
[W8A] Contact Input 23 Events	Disabled
[W8C] Contact Input 24 ID	Cont Ip 24
[W8C] Contact Input 24 Debounce Time	2.0 ms
[W8C] Contact Input 24 Events	Disabled

CONTACT INPUT THRESHOLDS

79 DESCO, 79 conectado, 63-FALLA PRE, 52A1 (a)(H7a, H7c, H8a, H8c)	33 Vdc
Cont Ip 5, Cont Ip 6, Cont Ip 7, Cont Ip 8(U7a, U7c, U8a, U8c)	33 Vdc
RECEP JAHUEL, RECEP ITAHUE, 52b P. CORTE, 52aP.CORTE(W1a, W1c, W2	33 Vdc)
CIERRE MANUA, TELE DESCONE, ITE AC FALLA, Cont Ip 16(W3a, W3c, W4	33 Vdc)
AUTORI 79, Cont Ip 18, Cont Ip 19, Cont Ip 20(W5a, W5c, W6a, W6c)	33 Vdc
Cont Ip 21, Cont Ip 22, Cont Ip 23, Cont Ip 24(W7a, W7c, W8a, W8c)	33 Vdc

CONTACT OUTPUTS

[H1] Contact Output 1 ID	TRIP FASE A
[H1] Contact Output 1 Operate	TRIP 3-POLE
[H1] Contact Output 1 Seal-In	OFF
[H1] Contact Output 1 Events	Enabled

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DEVICE DEFINITION
FILES
ORDER CODE: D60-G00-HCL-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

CONTACT OUTPUTS (continued from last page)

[H2] Contact Output 2 ID	TRIP FASE B
[H2] Contact Output 2 Operate	TRIP 3-POLE
[H2] Contact Output 2 Seal-In	OFF
[H2] Contact Output 2 Events	Enabled
[H3] Contact Output 3 ID	TRIP FASE C
[H3] Contact Output 3 Operate	TRIP 3-POLE
[H3] Contact Output 3 Seal-In	OFF
[H3] Contact Output 3 Events	Enabled
[H4] Contact Output 4 ID	RETRIP A
[H4] Contact Output 4 Operate	BKR FAIL 1 RETRIP
[H4] Contact Output 4 Seal-In	OFF
[H4] Contact Output 4 Events	Enabled
[H5] Contact Output 5 ID	RETRIP B
[H5] Contact Output 5 Operate	BKR FAIL 1 RETRIP
[H5] Contact Output 5 Seal-In	OFF
[H5] Contact Output 5 Events	Enabled
[H6] Contact Output 6 ID	RETRIP C
[H6] Contact Output 6 Operate	BKR FAIL 1 RETRIP
[H6] Contact Output 6 Seal-In	OFF
[H6] Contact Output 6 Events	Enabled
[M1] Contact Output 7 ID	Alarma trip
[M1] Contact Output 7 Operate	Alarma trip On (VO10)
[M1] Contact Output 7 Seal-In	OFF
[M1] Contact Output 7 Events	Enabled
[M2] Contact Output 8 ID	FALLA RELE
[M2] Contact Output 8 Operate	Alarma f. re On (VO7)
[M2] Contact Output 8 Seal-In	OFF
[M2] Contact Output 8 Events	Enabled
[M4] Contact Output 10 ID	PARAR CAJA
[M4] Contact Output 10 Operate	TRIP 3-POLE
[M4] Contact Output 10 Seal-In	OFF
[M4] Contact Output 10 Events	Enabled
[P1] Contact Output 15 ID	79 cierre
[P1] Contact Output 15 Operate	ORD. CIERRE On (VO6)
[P1] Contact Output 15 Seal-In	OFF
[P1] Contact Output 15 Events	Enabled
[P2] Contact Output 16 ID	EMISION JAHU
[P2] Contact Output 16 Operate	TX MMOO On (VO12)
[P2] Contact Output 16 Seal-In	OFF
[P2] Contact Output 16 Events	Enabled
[P3] Contact Output 17 ID	EMISION ITAH
[P3] Contact Output 17 Operate	TX MMOO On (VO12)
[P3] Contact Output 17 Seal-In	OFF
[P3] Contact Output 17 Events	Enabled
[P4] Contact Output 18 ID	50BF-->barra
[P4] Contact Output 18 Operate	BKR FAIL 1 T1 OP
[P4] Contact Output 18 Seal-In	OFF
[P4] Contact Output 18 Events	Enabled
[P6] Contact Output 20 ID	Parada Caja
[P6] Contact Output 20 Operate	TRIP 3-POLE
[P6] Contact Output 20 Seal-In	OFF
[P6] Contact Output 20 Events	Disabled

VIRTUAL OUTPUTS

Virtual Output 1 ID	BLQ Zonas PH
Virtual Output 1 Events	Enabled
Virtual Output 2 ID	TRIP GRAL
Virtual Output 2 Events	Enabled
Virtual Output 3 ID	OSCILOGRAFIA
Virtual Output 3 Events	Enabled
Virtual Output 4 ID	pkp Z1o z2
Virtual Output 4 Events	Enabled
Virtual Output 6 ID	ORD. CIERRE
Virtual Output 6 Events	Enabled
Virtual Output 7 ID	Alarma f. re
Virtual Output 7 Events	Disabled
Virtual Output 8 ID	POWER SWING
Virtual Output 8 Events	Enabled
Virtual Output 10 ID	Alarma trip

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DEVICE DEFINITION
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ORDER CODE: D60-G00-HCL-F8F-H6H-M6C-P6C-U6H-W6D
VERSION: 4.8X
DESCRIPTION: (NONE)
TEXT COLOR

VIRTUAL OUTPUTS (continued from last page)

Virtual Output 10 Events	Enabled
Virtual Output 11 ID	TX OPLAT
Virtual Output 11 Events	Enabled
Virtual Output 12 ID	TX MMOO
Virtual Output 12 Events	Disabled
Virtual Output 13 ID	LED Z1
Virtual Output 13 Events	Enabled
Virtual Output 14 ID	LED Z2
Virtual Output 14 Events	Enabled
Virtual Output 15 ID	LED Z3
Virtual Output 15 Events	Enabled
Virtual Output 16 ID	LED Z4
Virtual Output 16 Events	Enabled
Virtual Output 17 ID	79 on
Virtual Output 17 Events	Enabled
Virtual Output 18 ID	79 off
Virtual Output 18 Events	Enabled
Virtual Output 19 ID	reset led
Virtual Output 19 Events	Enabled
Virtual Output 22 ID	RECEP ACELER
Virtual Output 22 Events	Enabled
Virtual Output 23 ID	OPERA ZONA 1
Virtual Output 23 Events	Enabled
Virtual Output 24 ID	OPERA ZONA 2
Virtual Output 24 Events	Enabled
Virtual Output 25 ID	OPERA Z3/Z4
Virtual Output 25 Events	Enabled
Virtual Output 27 ID	67-67N
Virtual Output 27 Events	Enabled
Virtual Output 28 ID	51-51N
Virtual Output 28 Events	Enabled
Virtual Output 29 ID	50-50N
Virtual Output 29 Events	Enabled
Virtual Output 30 ID	Load encroch
Virtual Output 30 Events	Disabled
Virtual Output 31 ID	BLOQ 51
Virtual Output 31 Events	Enabled
Virtual Output 32 ID	REVERSE
Virtual Output 32 Events	Disabled
Virtual Output 33 ID	FORWARD
Virtual Output 33 Events	Disabled
Virtual Output 34 ID	BRK OPEN
Virtual Output 34 Events	Disabled
Virtual Output 35 ID	Z5 operada
Virtual Output 35 Events	Disabled
Virtual Output 36 ID	RECEP 3P
Virtual Output 36 Events	Enabled
Virtual Output 37 ID	ECHO 3P
Virtual Output 37 Events	Enabled
Virtual Output 38 ID	set grupo
Virtual Output 38 Events	Enabled
Virtual Output 39 ID	reset grupo
Virtual Output 39 Events	Enabled

RESETTING

Operand	reset led On (VO19)

CONTROL DE REVISIÓN DEL CRAP

REVISOR	FECHA	N° EAP	OBSERVACIONES
Max Missene M.	26-03-2015	Nº 02/2015	Normalización de ajustes con respecto al esquema de Teleprotecciones en el Sistema 2 protección GED60.
Max Missene M.	07-09-2015	Nº 75/2015	Cambio de ajustes para evitar que la Z1B actúe de forma instantánea en Sistema 1 protección Siemens 7SA61 .

Razón de TTCC/TTPP

TTCC: 1000/1

TTPP: $\frac{154000}{\sqrt{3}}/115/\frac{115}{\sqrt{3}}$

Particularidades de Ajustes

- No hay.

Max / Centro Sur / Tinguiririca / A9 TinguiV4.

MLFB:	7SA61215AB927PR4
Versión del juego de parámetros:	V04.63.04
Ruta del equipo:	C:\Siemens\Digsi4\D4PROJ\Max\P7DI\GV\ST\00000052
Autor:	
Creado el:	23.10.15 11:56:07
Mod. por última vez el:	23.10.15 12:05:13
Modo de operación:	Sin línea
Comentario:	
Valores de ajuste en:	Presentación secundaria de los valores

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1 Device Configuration

Nº	Función	Volumen
0103	Setting Group Change Option	Disabled
0110	Trip mode	1-/3pole
0114	Distance protection pickup program	Z< (quadrilateral)
0120	Power Swing detection	Enabled
0121	Teleprotection for Distance prot.	POTT
0122	DTT Direct Transfer Trip	Disabled
0124	Instantaneous HighSpeed SOTF Overcurrent	Enabled
0125	Weak Infeed (Trip and/or Echo)	Enabled
0126	Backup overcurrent	Time Overcurrent Curve IEC
0131	Earth fault overcurrent	Time Overcurrent Curve IEC
0132	Teleprotection for Earth fault overcurr.	Disabled
0133	Auto-Reclose Function	1 AR-cycle
0134	Auto-Reclose control mode	with Trip and Action time
0135	Synchronism and Voltage Check	Enabled
0136	Over / Underfrequency Protection	Disabled
0137	Under / Overvoltage Protection	Disabled
0138	Fault Locator	Enabled
0139	Breaker Failure Protection	Enabled
0140	Trip Circuit Supervision	Disabled
0142	Thermal overload protection	Disabled

2 Power System Data 1

2.1 Grupo Power System Data 1; Grupo Transformers

Grupo Power System Data 1; Grupo Transformers

Nº	Parámetro	Valor	Grupo
0201	CT Starpoint	towards Line	todo
0203	Rated Primary Voltage	154,0 kV	todo
0204	Rated Secondary Voltage (Ph-Ph)	115 V	todo
0205	CT Rated Primary Current	1000 A	todo
0206	CT Rated Secondary Current	1A	todo
0210	U4 voltage transformer is	Usy2 transformer	todo
0211	Matching ratio Phase-VT To Open-Delta-VT	0,58	todo
0212	VT connection for Usy2	L2-E	todo
0214A	Angle adjustment Usy2-Usy1	0 °	todo
0215	Matching ratio Usy1 / Usy2	1,00	todo
0220	I4 current transformer is	Neutral Current (of the protected line)	todo
0221	Matching ratio I4/Iph for CT's	1,000	todo

2.2 Grupo Power System Data 1; Grupo Power System

Grupo Power System Data 1; Grupo Power System

Nº	Parámetro	Valor	Grupo
0207	System Starpoint is	Solid Earthed	todo
0230	Rated Frequency	50 Hz	todo
0235	Phase Sequence	L1 L2 L3	todo
0236	Distance measurement unit	km	todo
0237	Setting format for zero seq.comp. format	Zero seq. comp. factor K0 and angle(K0)	todo
0238A	Earth Fault O/C: setting for 1pole AR	all stages together	todo

2.3 Grupo Power System Data 1; Grupo Breaker

Grupo Power System Data 1; Grupo Breaker

Nº	Parámetro	Valor	Grupo
0239	Closing (operating) time of CB	0,06 sec	todo
0240A	Minimum TRIP Command Duration	0,12 sec	todo
0241A	Maximum Close Command Duration	0,25 sec	todo
0242	Dead Time for CB test-autoreclosure	0,10 sec	todo

3 Grupos de parámetros

3.1 Grupo Power System Data 2; Grupo Power System

Grupo Power System Data 2; Grupo Power System

Nº	Parámetro	Valor	Grupo
1103	Measurement: Full Scale Voltage (100%)	154,0 kV	A
1104	Measurement: Full Scale Current (100%)	1000 A	A
1105	Line Angle	77 °	A
1211	Angle of inclination, distance charact.	77 °	A
1107	P,Q operational measured values sign	not reversed	A
1110	x' - Line Reactance per length unit	0,3050 Ohm / km	A
1111	Line Length	110,9 km	A
1120	Zero seq. comp. factor K0 for zone Z1	0,804	A
1121	Zero seq. comp. angle for zone Z1	4,64 °	A
1122	Zero seq.comp.factor K0,higher zones >Z1	0,804	A
1123	Zero seq. comp. angle, higher zones >Z1	4,64 °	A

3.2 Grupo Power System Data 2; Grupo Line Status

Grupo Power System Data 2; Grupo Line Status

Nº	Parámetro	Valor	Grupo
1130A	Pole Open Current Threshold	0,05 A	A
1131A	Pole Open Voltage Threshold	11 V	A
1132A	Seal-in Time after ALL closures	0,20 sec	A
1133A	minimal time for line open before SOTF	0,25 sec	A
1134	Recognition of Line Closures with	CBaux OR Current or Manual close BI	A
1135	RESET of Trip Command	with Pole Open Current Threshold only	A
1136	open pole detector	with measurement (U/I,trip,pickup,CBaux)	A
1140A	CT Saturation Threshold	oo A	A
1150A	Seal-in Time after MANUAL closures	0,20 sec	A
1151	Manual CLOSE COMMAND generation	NO	A
1152	MANUAL Closure Impulse after CONTROL	<none>	todo

3.3 Grupo Power System Data 2; Grupo Trip 1-/3-pole

Grupo Power System Data 2; Grupo Trip 1-/3-pole

Nº	Parámetro	Valor	Grupo
1155	3 pole coupling	with Trip	A
1156A	Trip type with 2phase faults	3pole	A

3.4 Grupo Distance protection, general settings; Grupo General

Grupo Distance protection, general settings; Grupo General

Nº	Parámetro	Valor	Grupo
1201	Distance protection	ON	A
1202	Phase Current threshold for dist. meas.	0,05 A	A
1211	Angle of inclination, distance charact.	77 °	A
1208	Series compensated line	NO	A
1232	Instantaneous trip after SwitchOnToFault	with Zone Z1B	A
1241	R load, minimum Load Impedance (ph-e)	oo Ohm	A
1242	PHI load, maximum Load Angle (ph-e)	35 °	A
1243	R load, minimum Load Impedance (ph-ph)	oo Ohm	A
1244	PHI load, maximum Load Angle (ph-ph)	35 °	A
1317A	Single pole trip for faults in Z2	NO	A
1357	Z1B enabled before 1st AR (int. or ext.)	NO	A

3.5 Grupo Distance protection, general settings; Grupo Earth faults

Grupo Distance protection, general settings; Grupo Earth faults

Nº	Parámetro	Valor	Grupo
1203	3I0 threshold for neutral current pickup	0,05 A	A
1204	3U0 threshold zero seq. voltage pickup	2 V	A
1207A	3I0>-pickup-stabilisation (3I0> /Iphmax)	0,10	A
1209A	criterion of earth fault recognition	3I0> OR 3U0>	A
1221A	Loop selection with 2Ph-E faults	all loops	A

3.6 Grupo Distance protection, general settings; Grupo Time Delays

Grupo Distance protection, general settings; Grupo Time Delays

Nº	Parámetro	Valor	Grupo
1210	Condition for zone timer start	with distance pickup	A
1305	T1-1phase, delay for single phase faults	0,00 sec	A
1306	T1multi-ph, delay for multi phase faults	0,00 sec	A
1315	T2-1phase, delay for single phase faults	0,60 sec	A
1316	T2multi-ph, delay for multi phase faults	0,60 sec	A
1325	T3 delay	2,50 sec	A
1335	T4 delay	1,50 sec	A
1345	T5 delay	oo sec	A
1355	T1B-1phase, delay for single ph. faults	0,00 sec	A
1356	T1B-multi-ph, delay for multi ph. faults	0,00 sec	A

3.7 Grupo Distance zones (quadrilateral); Grupo Zone Z1

Grupo Distance zones (quadrilateral); Grupo Zone Z1

Nº	Parámetro	Valor	Grupo
1301	Operating mode Z1	Forward	A
1302	R(Z1), Resistance for ph-ph-faults	19,494 Ohm	A
1303	X(Z1), Reactance	19,494 Ohm	A
1304	RE(Z1), Resistance for ph-e faults	19,494 Ohm	A
1305	T1-1phase, delay for single phase faults	0,00 sec	A
1306	T1multi-ph, delay for multi phase faults	0,00 sec	A
1307	Zone Reduction Angle (load compensation)	0 °	A

3.8 Grupo Distance zones (quadrilateral); Grupo Zone Z1B-exten.

Grupo Distance zones (quadrilateral); Grupo Zone Z1B-exten.

Nº	Parámetro	Valor	Grupo
1351	Operating mode Z1B (overrreach zone)	Forward	A
1352	R(Z1B), Resistance for ph-ph-faults	68,181 Ohm	A
1353	X(Z1B), Reactance	68,181 Ohm	A
1354	RE(Z1B), Resistance for ph-e faults	68,181 Ohm	A
1355	T1B-1phase, delay for single ph. faults	0,00 sec	A
1356	T1B-multi-ph, delay for multi ph. faults	0,00 sec	A
1357	Z1B enabled before 1st AR (int. or ext.)	NO	A

3.9 Grupo Distance zones (quadrilateral); Grupo Zone Z2

Grupo Distance zones (quadrilateral); Grupo Zone Z2

Nº	Parámetro	Valor	Grupo
1311	Operating mode Z2	Forward	A
1312	R(Z2), Resistance for ph-ph-faults	34,798 Ohm	A
1313	X(Z2), Reactance	34,798 Ohm	A
1314	RE(Z2), Resistance for ph-e faults	34,798 Ohm	A
1315	T2-1phase, delay for single phase faults	0,60 sec	A
1316	T2multi-ph, delay for multi phase faults	0,60 sec	A
1317A	Single pole trip for faults in Z2	NO	A

3.10 Grupo Distance zones (quadrilateral); Grupo Zone Z3

Grupo Distance zones (quadrilateral); Grupo Zone Z3

Nº	Parámetro	Valor	Grupo
1321	Operating mode Z3	Reverse	A
1322	R(Z3), Resistance for ph-ph-faults	67,750 Ohm	A
1323	X(Z3), Reactance	67,750 Ohm	A
1324	RE(Z3), Resistance for ph-e faults	67,750 Ohm	A
1325	T3 delay	2,50 sec	A

3.11 Grupo Distance zones (quadrilateral); Grupo Zone Z4

Grupo Distance zones (quadrilateral); Grupo Zone Z4

Nº	Parámetro	Valor	Grupo
1331	Operating mode Z4	Forward	A
1332	R(Z4), Resistance for ph-ph-faults	66,957 Ohm	A
1333	X(Z4), Reactance	66,957 Ohm	A
1334	RE(Z4), Resistance for ph-e faults	66,957 Ohm	A
1335	T4 delay	1,50 sec	A

3.12 Grupo Distance zones (quadrilateral); Grupo Zone Z5

Grupo Distance zones (quadrilateral); Grupo Zone Z5

Nº	Parámetro	Valor	Grupo
1341	Operating mode Z5	Non-Directional	A
1342	R(Z5), Resistance for ph-ph-faults	70,000 Ohm	A
1343	X(Z5)+, Reactance for Forward direction	70,000 Ohm	A
1344	RE(Z5), Resistance for ph-e faults	70,000 Ohm	A
1345	T5 delay	oo sec	A
1346	X(Z5)-, Reactance for Reverse direction	70,000 Ohm	A

3.13 Grupo Power Swing

Grupo Power Swing

Nº	Parámetro	Valor	Grupo
2002	Power Swing Operating mode	all zones blocked	A
2006	Power swing trip	NO	A
2007	Trip delay after Power Swing Blocking	0,10 sec	A

3.14 Grupo Teleprotection for Distance prot.

Grupo Teleprotection for Distance prot.

Nº	Parámetro	Valor	Grupo
2101	Teleprotection for Distance protection	ON	A
2102	Type of Line	Three Terminals	A
2103A	Time for send signal prolongation	0,10 sec	A
2109A	Transient Block.: Duration external flt.	0,03 sec	A
2110A	Transient Block.: Blk.T. after ext. flt.	0,17 sec	A

3.15 Grupo Instantaneous HighSpeed SOTF Overcurrent

Grupo Instantaneous HighSpeed SOTF Overcurrent

Nº	Parámetro	Valor	Grupo
2401	Inst. High Speed SOTF-O/C is	ON	A

Grupo Instantaneous HighSpeed SOTF Overcurrent(2)

Nº	Parámetro	Valor	Grupo
2404	I>>> Pickup	0,80 A	A

3.16 Grupo Weak Infeed (Trip and/or Echo)

Grupo Weak Infeed (Trip and/or Echo)

Nº	Parámetro	Valor	Grupo
2501	Weak Infeed function	Echo only	A
2502A	Trip / Echo Delay after carrier receipt	0,04 sec	A
2503A	Trip Extension / Echo Impulse time	0,10 sec	A
2504A	Echo Block Time	0,50 sec	A
2505	Undervoltage (ph-e)	24 V	A
2509	Echo logic: Dis and EF on common channel	NO	todo

3.17 Grupo Backup overcurrent; Grupo General

Grupo Backup overcurrent; Grupo General

Nº	Parámetro	Valor	Grupo
2601	Operating mode	ON:only active with Loss of VT sec. cir.	A
2680	Trip time delay after SOTF	0,00 sec	A

3.18 Grupo Backup overcurrent; Grupo I>>

Grupo Backup overcurrent; Grupo I>>

Nº	Parámetro	Valor	Grupo
2610	Iph>> Pickup	oo A	A
2611	T Iph>> Time delay	oo sec	A
2612	3I0>> Pickup	oo A	A
2613	T 3I0>> Time delay	oo sec	A
2614	Instantaneous trip via BI	NO	A
2615	Instantaneous trip after SwitchOnToFault	NO	A

3.19 Grupo Backup overcurrent; Grupo I>

Grupo Backup overcurrent; Grupo I>

Nº	Parámetro	Valor	Grupo
2620	Iph> Pickup	oo A	A
2621	T Iph> Time delay	oo sec	A
2622	3I0> Pickup	oo A	A
2623	T 3I0> Time delay	oo sec	A
2624	Instantaneous trip via Teleprot./BI	NO	A
2625	Instantaneous trip after SwitchOnToFault	NO	A

3.20 Grupo Backup overcurrent; Grupo Inverse

Grupo Backup overcurrent; Grupo Inverse

Nº	Parámetro	Valor	Grupo
2640	Ip> Pickup	0,72 A	A
2642	T Ip Time Dial	0,10 sec	A
2646	T Ip Additional Time Delay	0,00 sec	A
2650	3I0p Pickup	0,05 A	A
2652	T 3I0p Time Dial	0,30 sec	A
2656	T 3I0p Additional Time Delay	0,00 sec	A
2660	IEC Curve	Normal Inverse	A
2670	Instantaneous trip via Teleprot./BI	NO	A
2671	Instantaneous trip after SwitchOnToFault	NO	A

3.21 Grupo Backup overcurrent; Grupo I - STUB

Grupo Backup overcurrent; Grupo I - STUB

Nº	Parámetro	Valor	Grupo
2630	Iph> STUB Pickup	oo A	A
2631	T Iph STUB Time delay	oo sec	A
2632	3I0> STUB Pickup	oo A	A
2633	T 3I0 STUB Time delay	oo sec	A
2634	Instantaneous trip via Teleprot./BI	NO	A
2635	Instantaneous trip after SwitchOnToFault	NO	A

3.22 Grupo Measurement Supervision; Grupo Balance / Summ.

Grupo Measurement Supervision; Grupo Balance / Summ.

Nº	Parámetro	Valor	Grupo
2901	Measurement Supervision	ON	A
2902A	Voltage Threshold for Balance Monitoring	48 V	A
2903A	Balance Factor for Voltage Monitor	0,75	A
2904A	Current Balance Monitor	0,10 A	A
2905A	Balance Factor for Current Monitor	0,50	A
2906A	Summated Current Monitoring Threshold	0,06 A	A
2907A	Summated Current Monitoring Factor	0,10	A
2908A	T Balance Factor for Voltage Monitor	5 sec	A
2909A	T Current Balance Monitor	5 sec	A

3.23 Grupo Measurement Supervision; Grupo Fuse Fail. Mon.

Grupo Measurement Supervision; Grupo Fuse Fail. Mon.

Nº	Parámetro	Valor	Grupo
2910	Fuse Failure Monitor	ON	A
2911A	Minimum Voltage Threshold U>	29 V	A
2912A	Maximum Current Threshold I<	0,10 A	A
2913A	Maximum Voltage Threshold U< (3phase)	5 V	A
2914A	Delta Current Threshold (3phase)	0,06 A	A
2915	Voltage Failure Supervision	with current superv. and CBaux	A
2916A	Delay Voltage Failure Supervision	3,00 sec	A

3.24 Grupo Measurement Supervision; Grupo VT mcb

Grupo Measurement Supervision; Grupo VT mcb

Nº	Parámetro	Valor	Grupo
2921	VT mcb operating time	5 ms	A

3.25 Grupo Measurement Supervision; Grupo Load Angle

Grupo Measurement Supervision; Grupo Load Angle

Nº	Parámetro	Valor	Grupo
2941	Limit setting PhiA	200 °	A
2942	Limit setting PhiB	340 °	A
2943	Minimum value I1>	0,05 A	A
2944	Minimum value U1>	19 V	A

3.26 Grupo Earth fault overcurrent; Grupo General

Grupo Earth fault overcurrent; Grupo General

Nº	Parámetro	Valor	Grupo
3101	Earth Fault overcurrent function	ON	A
3102	Block E/F for Distance protection	NO	A
3174	Block E/F for Distance Protection Pickup	in each zone	A
3103	Block E/F for 1pole Dead time	YES	A
3104A	Stabilisation Slope with Iphase	10 %	A
3109	Single pole trip with earth flt.prot.	YES	A
3170	2nd harmonic ratio for inrush restraint	20 %	A
3171	Max.Current, overriding inrush restraint	4,50 A	A
3172	Instantaneous mode after SwitchOnToFault	with Pickup and direction	A
3173	Trip time delay after SOTF	0,00 sec	A

3.27 Grupo Earth fault overcurrent; Grupo 3I0>>>

Grupo Earth fault overcurrent; Grupo 3I0>>>

Nº	Parámetro	Valor	Grupo
3110	Operating mode	Inactive	A
3111	3I0>>> Pickup	4,00 A	A
3112	T 3I0>>> Time delay	0,30 sec	A
3113	Instantaneous trip via Teleprot./BI	NO	A
3114	Instantaneous trip after SwitchOnToFault	NO	A
3115	Inrush Blocking	NO	A

3.28 Grupo Earth fault overcurrent; Grupo 3I0>>

Grupo Earth fault overcurrent; Grupo 3I0>>

Nº	Parámetro	Valor	Grupo
3120	Operating mode	Inactive	A
3121	3I0>> Pickup	2,00 A	A
3122	T 3I0>> Time Delay	0,60 sec	A
3123	Instantaneous trip via Teleprot./BI	NO	A
3124	Instantaneous trip after SwitchOnToFault	NO	A
3125	Inrush Blocking	NO	A

3.29 Grupo Earth fault overcurrent; Grupo 3I0>

Grupo Earth fault overcurrent; Grupo 3I0>

Nº	Parámetro	Valor	Grupo
3130	Operating mode	Inactive	A
3131	3I0> Pickup	1,00 A	A
3132	T 3I0> Time Delay	0,90 sec	A
3133	Instantaneous trip via Teleprot./BI	NO	A
3134	Instantaneous trip after SwitchOnToFault	NO	A
3135	Inrush Blocking	NO	A

3.30 Grupo Earth fault overcurrent; Grupo 3I0 InverseTime

Grupo Earth fault overcurrent; Grupo 3I0 InverseTime

Nº	Parámetro	Valor	Grupo
3140	Operating mode	Forward	A
3141	3I0p Pickup	0,05 A	A
3143	3I0p Time Dial	0,30 sec	A
3147	Additional Time Delay	0,00 sec	A
3148	Instantaneous trip via Teleprot./BI	NO	A
3149	Instantaneous trip after SwitchOnToFault	NO	A
3150	Inrush Blocking	NO	A
3151	IEC Curve	Normal Inverse	A

3.31 Grupo Earth fault overcurrent; Grupo Direction

Grupo Earth fault overcurrent; Grupo Direction

Nº	Parámetro	Valor	Grupo
3160	Polarization	with U0 + IY or U2	A
3162A	ALPHA, lower angle for forward direction	338 °	A
3163A	BETA, upper angle for forward direction	122 °	A
3164	Min. zero seq.voltage 3U0 for polarizing	3,0 V	A
3166	Min. neg. seq. polarizing voltage 3U2	3,0 V	A
3167	Min. neg. seq. polarizing current 3I2	0,05 A	A
3168	Compensation angle PHI comp. for Sr	255 °	A
3169	Forward direction power threshold	0,9 VA	A

3.32 Grupo Automatic Reclosure; Grupo General

Grupo Automatic Reclosure; Grupo General

Nº	Parámetro	Valor	Grupo
3401	Auto-Reclose function	ON	A
3402	CB ready interrogation at 1st trip	YES	A
3403	Reclaim time after successful AR cycle	8,00 sec	A
3404	AR blocking duration after manual close	8,00 sec	A
3406	Evolving fault recognition	with Trip	A
3407	Evolving fault (during the dead time)	blocks AR	A
3408	AR start-signal monitoring time	0,20 sec	A
3409	Circuit Breaker (CB) Supervision Time	3,00 sec	A
3410	Send delay for remote close command	oo sec	A
3411A	Maximum dead time extension	oo sec	A

3.33 Grupo Automatic Reclosure; Grupo 1st AR-cyle

Grupo Automatic Reclosure; Grupo 1st AR-cyle

Nº	Parámetro	Valor	Grupo
3450	Start of AR allowed in this cycle	YES	A
3451	Action time	0,20 sec	A
3456	Dead time after 1pole trip	1,20 sec	A
3457	Dead time after 3pole trip	0,50 sec	A
3458	Dead time after evolving fault	1,00 sec	A
3459	CB ready interrogation before reclosing	YES	A
3460	Request for synchro-check after 3pole AR	YES	A

3.34 Grupo Automatic Reclosure; Grupo 3pTRIP/DLC/RDT

Grupo Automatic Reclosure; Grupo 3pTRIP/DLC/RDT

Nº	Parámetro	Valor	Grupo
3430	3pole TRIP by AR	YES	A
3431	Dead Line Check or Reduced Dead Time	Without	A
3438	Supervision time for dead/ live voltage	0,10 sec	A
3440	Voltage threshold for live line or bus	46 V	A
3441	Voltage threshold for dead line or bus	27 V	A

3.35 Grupo Automatic Reclosure; Grupo Start AR with..

Grupo Automatic Reclosure; Grupo Start AR with..

Nº	Parámetro	Valor	Grupo
3420	AR with distance protection	YES	A
3421	AR with switch-onto-fault overcurrent	NO	A
3422	AR with weak infeed tripping	NO	A
3423	AR with earth fault overcurrent prot.	NO	A
3425	AR with back-up overcurrent	NO	A

3.36 Grupo Synchronism and Voltage Check; Grupo General

Grupo Synchronism and Voltage Check; Grupo General

Nº	Parámetro	Valor	Grupo
3501	Synchronism and Voltage Check function	ON	A
3502	Voltage threshold dead line / bus	23 V	A
3503	Voltage threshold live line / bus	81 V	A
3504	Maximum permissible voltage	138 V	A
3507	Maximum duration of synchronism-check	1,00 sec	A
3508	Synchronous condition stability timer	0,10 sec	A
3509	Synchronizable circuit breaker	<none>	todo

3.37 Grupo Synchronism and Voltage Check; Grupo with AR

Grupo Synchronism and Voltage Check; Grupo with AR

Nº	Parámetro	Valor	Grupo
3510	Operating mode with AR	without consideration of CB closing time	A
3511	Maximum voltage difference	30,0 V	A
3512	Maximum frequency difference	0,10 Hz	A
3513	Maximum angle difference	30 °	A
3515A	AR at Usy2>, Usy1>, and Synchr.	YES	A
3516	AR at Usy1< and Usy2>	NO	A
3517	AR at Usy1> and Usy2<	NO	A
3518	AR at Usy1< and Usy2<	NO	A
3519	Override of any check before AR	NO	A

3.38 Grupo Synchronism and Voltage Check; Grupo Man.Close+CNTRL

Grupo Synchronism and Voltage Check; Grupo Man.Close+CNTRL

Nº	Parámetro	Valor	Grupo
3530	Operating mode with Man.Cl	without consideration of CB closing time	A
3531	Maximum voltage difference	9,5 V	A
3532	Maximum frequency difference	0,10 Hz	A
3533	Maximum angle difference	10 °	A
3535A	Manual Close at Usy2>, Usy1>, and Synchr	NO	A
3536	Manual Close at Usy1< and Usy2>	NO	A
3537	Manual Close at Usy1> and Usy2<	NO	A
3538	Manual Close at Usy1< and Usy2<	NO	A
3539	Override of any check before Man.Cl	NO	A

3.39 Grupo Fault Locator

Grupo Fault Locator

Nº	Parámetro	Valor	Grupo
3802	Start fault locator with	TRIP	A
3806	Load Compensation	YES	A

3.40 Grupo Breaker Failure; Grupo Breaker Failure

Grupo Breaker Failure; Grupo Breaker Failure

Nº	Parámetro	Valor	Grupo
3901	Breaker Failure Protection	ON	A
3902	Pick-up threshold I>	0,15 A	A
3903	1pole retrip with stage T1 (local trip)	NO	A
3904	T1, Delay after 1pole start (local trip)	0,01 sec	A
3905	T1, Delay after 3pole start (local trip)	0,01 sec	A
3906	T2, Delay of 2nd stage (busbar trip)	0,20 sec	A
3907	T3, Delay for start with defective bkr.	0,00 sec	A
3908	Trip output selection with defective bkr	NO	A
3909	Check Breaker contacts	YES	A

3.41 Grupo Breaker Failure; Grupo End fault prot.

Grupo Breaker Failure; Grupo End fault prot.

Nº	Parámetro	Valor	Grupo
3921	End fault protection	OFF	A
3922	Trip delay of end fault protection	2,00 sec	A

3.42 Grupo Breaker Failure; Grupo PoleDiscrepancy

Grupo Breaker Failure; Grupo PoleDiscrepancy

Nº	Parámetro	Valor	Grupo
3931	Pole Discrepancy supervision	OFF	A
3932	Trip delay with pole discrepancy	2,00 sec	A

URS A9 DESPUЙS DE CAMBIO DE AJUSTES 26.03.2015.URS
C:\USERS\MMISSENE\DESKTOP\MMM\ACTUALIZACIУN CRAPS\TINGU\A9
DEVICE DEFINITION
FILES
ORDER CODE: D60-K03-HCH-F8L-H6U-M6U-P6U-U6U-W6T
VERSION: 5.7X
UR SERIAL NUMBER: AE5C09000046
SETTINGS SEND TO RELAY: SATURDAY, FEBRUARY 07, 2015 08:50:11
DESCRIPTION: (NONE)
TEXT COLOR

RELAY INFORMATION

Main Firmware:	570
Boot Firmware:	301
Relay Serial Number:	AE5C09000046
CPU Serial Number:	A9KC09002060
F8L Module Serial Number	A8LC08003420
H6U Module Serial Number	A6UC08001774
M6U Module Serial Number	A6UC08001807
P6U Module Serial Number	A6UC08001790
U6U Module Serial Number	A6UC08001801
W6T Module Serial Number	A6TC08000982
Settings Send to Relay	Saturday, February 07, 2015 08:50:11

PRODUCT SETUP

SECURITY

Command Password	0
Setting Password	0
Command Password Access Timeout	5 min
Setting Password Access Timeout	30 min
Invalid Password Attempts	3
Password Lockout Duration	5 min
Password Access Events	Disabled
Local Setting Authorized	ON
Remote Setting Authorized	ON
Access Authorized Timeout	30 min

DISPLAY PROPERTIES

Flash Message Time	1.0 s
Default Message Timeout	300 s
Default Message Intensity (VFD Only)	25 %
Screen Saver Feature (LCD Only)	Enabled
Screen Saver Wait Time (LCD Only)	30 min
Current Cutoff Level	0.020 pu
Voltage Cutoff Level	1.0 V

COMMUNICATIONS

SERIAL PORTS

RS485 Com2 Baud Rate	19200
RS485 Com2 Parity	None
RS485 Com2 Response Min Time	0 ms

NETWORK

IP Address	192.168.104. 40
IP Subnet Mask	0. 0. 0. 0
Gateway IP Address	127. 0. 0. 1
Ethernet Operation Mode	Full-Duplex
OSI Network Address (NSAP)	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

MODBUS PROTOCOL

Modbus Slave Address	40
Modbus TCP Port Number	502

DNP PROTOCOL

DNP Channel 1 Port	NETWORK - TCP
DNP Channel 2 Port	NONE
DNP Address	40
DNP Client Address 1	192.168.104.101
DNP Client Address 2	0. 0. 0. 0
DNP Client Address 3	0. 0. 0. 0
DNP Client Address 4	0. 0. 0. 0
DNP Client Address 5	0. 0. 0. 0
DNP TCP/UDP Port Number	20000
DNP Unsol Resp Function	Disabled
DNP Unsol Resp Timeout	5 s
DNP Unsol Resp Max Retries	10
DNP Unsol Resp Dest Addr	1

URS A9 DESPUÏS DE CAMBIO DE AJUSTES 26.03.2015.URS
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DEVICE DEFINITION
FILES
ORDER CODE: D60-K03-HCH-F8L-H6U-M6U-P6U-U6U-W6T
VERSION: 5.7X
UR SERIAL NUMBER: AE5C09000046
SETTINGS SEND TO RELAY: SATURDAY, FEBRUARY 07, 2015 08:50:11
DESCRIPTION: (NONE)
TEXT COLOR

DNP PROTOCOL (continued from last page)

DNP Current Scale Factor	0.1
DNP Voltage Scale Factor	100
DNP Power Scale Factor	100000
DNP Energy Scale Factor	1
DNP Power Factor Scale Factor	1
DNP Other Scale Factor	0.1
DNP Current Default Deadband	30000
DNP Voltage Default Deadband	30000
DNP Power Default Deadband	30000
DNP Energy Default Deadband	30000
DNP Power Factor Default Deadband	30000
DNP Other Default Deadband	30000
DNP Time Sync IIN Period	1440 min
DNP Message Fragment Size	240
DNP Object 1 Default Variation	2
DNP Object 2 Default Variation	2
DNP Object 20 Default Variation	1
DNP Object 21 Default Variation	1
DNP Object 22 Default Variation	1
DNP Object 23 Default Variation	1
DNP Object 30 Default Variation	2
DNP Object 32 Default Variation	1
DNP Number of Paired Controls	0
DNP TCP Connection Timeout	120 s

DNP - IEC104 POINTS LISTS

DNP Binary Input Point 0	DNP 79 BLOQ On (VO30)
DNP Binary Input Point 1	DNP 79 ON On (VO31)
DNP Binary Input Point 2	DNP TP LINEA On (VO32)
DNP Binary Input Point 3	DNP TP BARRA On (VO33)
DNP Binary Input Point 4	DNP RX RAN On (VO34)
DNP Binary Input Point 5	DNP TX 85A On (VO35)
DNP Binary Input Point 6	DNP RX JAH On (VO36)
DNP Binary Input Point 7	DNP ECHO On (VO37)
DNP Binary Input Point 8	DNP 79 CLOSE On (VO38)
DNP Binary Input Point 9	DNP 21/21N On (VO39)
DNP Binary Input Point 10	DNP 67N On (VO40)
DNP Binary Input Point 11	DNP 50BF On (VO41)
DNP Binary Input Point 12	DNP Z1B On (VO42)
DNP Binary Input Point 13	DNP Z1 On (VO43)
DNP Binary Input Point 14	DNP Z2 On (VO44)
DNP Binary Input Point 15	DNP Z3 On (VO45)
DNP Binary Input Point 16	DNP Z4 On (VO46)
DNP Binary Input Point 17	DNP 51/51N On (VO47)
DNP Binary Input Point 18	DNP TRIP A On (VO48)
DNP Binary Input Point 19	DNP TRIP B On (VO49)
DNP Binary Input Point 20	DNP TRIP C On (VO50)
DNP Binary Input Point 21	DNP TRIP GND On (VO51)
DNP Binary Input Point 22	DNP TRIP S1 On (VO52)
DNP Binary Input Point 23	DNP PICKUP On (VO53)
DNP Binary Input Point 24	DNP MOD EMER On (VO54)
DNP Binary Input Point 25	DNP SOTF On (VO55)
DNP Binary Input Point 26	DNP VT FAIL On (VO56)
DNP Binary Input Point 27	DNP PSWING On (VO57)
DNP Binary Input Point 28	DNP 79BLQ EX On (VO58)
DNP Binary Input Point 29	DNP RX85D On (VO59)
DNP Binary Input Point 30	DNP TX85D On (VO60)
DNP Binary Input Point 31	DNP INC PCOR On (VO61)
DNP Analog Input Point 0	Fault Location [1]

IEC 61850
GSSE / GOOSE CONFIGURATION
TRANSMISSION
GENERAL

Default GSSE/GOOSE Update Time	60 s

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VERSION: 5.7X
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DESCRIPTION: (NONE)
TEXT COLOR

GSSE

Function	Enabled
ID	GSSEOut
Destination MAC	00 00 00 00 00 00

TX CONFIGURABLE GOOSE

GOOSEOut 1 Function	Enabled
GOOSEOut 1 ID	GOOSEOut_1
GOOSEOut 1 Destination MAC	00 00 00 00 00 00
GOOSEOut 1 VLAN Priority	4
GOOSEOut 1 VLAN ID	0
GOOSEOut 1 ETYPE APPID	0
GOOSEOut 1 ConfRev	1
GOOSEOut 1 Retransmission Curve	Relaxed
GOOSEOut 2 Function	Enabled
GOOSEOut 2 ID	GOOSEOut_2
GOOSEOut 2 Destination MAC	00 00 00 00 00 00
GOOSEOut 2 VLAN Priority	4
GOOSEOut 2 VLAN ID	0
GOOSEOut 2 ETYPE APPID	0
GOOSEOut 2 ConfRev	1
GOOSEOut 2 Retransmission Curve	Relaxed
GOOSEOut 3 Function	Enabled
GOOSEOut 3 ID	GOOSEOut_3
GOOSEOut 3 Destination MAC	00 00 00 00 00 00
GOOSEOut 3 VLAN Priority	4
GOOSEOut 3 VLAN ID	0
GOOSEOut 3 ETYPE APPID	0
GOOSEOut 3 ConfRev	1
GOOSEOut 3 Retransmission Curve	Relaxed
GOOSEOut 4 Function	Enabled
GOOSEOut 4 ID	GOOSEOut_4
GOOSEOut 4 Destination MAC	00 00 00 00 00 00
GOOSEOut 4 VLAN Priority	4
GOOSEOut 4 VLAN ID	0
GOOSEOut 4 ETYPE APPID	0
GOOSEOut 4 ConfRev	1
GOOSEOut 4 Retransmission Curve	Relaxed
GOOSEOut 5 Function	Enabled
GOOSEOut 5 ID	GOOSEOut_5
GOOSEOut 5 Destination MAC	00 00 00 00 00 00
GOOSEOut 5 VLAN Priority	4
GOOSEOut 5 VLAN ID	0
GOOSEOut 5 ETYPE APPID	0
GOOSEOut 5 ConfRev	1
GOOSEOut 5 Retransmission Curve	Relaxed
GOOSEOut 6 Function	Enabled
GOOSEOut 6 ID	GOOSEOut_6
GOOSEOut 6 Destination MAC	00 00 00 00 00 00
GOOSEOut 6 VLAN Priority	4
GOOSEOut 6 VLAN ID	0
GOOSEOut 6 ETYPE APPID	0
GOOSEOut 6 ConfRev	1
GOOSEOut 6 Retransmission Curve	Relaxed
GOOSEOut 7 Function	Enabled
GOOSEOut 7 ID	GOOSEOut_7
GOOSEOut 7 Destination MAC	00 00 00 00 00 00
GOOSEOut 7 VLAN Priority	4
GOOSEOut 7 VLAN ID	0
GOOSEOut 7 ETYPE APPID	0
GOOSEOut 7 ConfRev	1
GOOSEOut 7 Retransmission Curve	Relaxed
GOOSEOut 8 Function	Enabled
GOOSEOut 8 ID	GOOSEOut_8
GOOSEOut 8 Destination MAC	00 00 00 00 00 00

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DEVICE DEFINITION
FILES
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VERSION: 5.7X
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DESCRIPTION: (NONE)
TEXT COLOR

TX CONFIGURABLE GOOSE (continued from last page)

GOOSEOut 8 VLAN Priority	4
GOOSEOut 8 VLAN ID	0
GOOSEOut 8 ETYPE APPID	0
GOOSEOut 8 ConfRev	1
GOOSEOut 8 Retransmission Curve	Relaxed

SERVER CONFIGURATION

IEDName	IEDName
Logical Device Instance	LDInst
MMS TCP Port Number	102
LPHD DC PhyNam location	Location

MMXU DEADBANDS

MMXU1: TotW Deadband	10.000 %
MMXU1: TotVAr Deadband	10.000 %
MMXU1: TotVA Deadband	10.000 %
MMXU1: TotPF Deadband	10.000 %
MMXU1: Hz Deadband	10.000 %
MMXU1: PPV phsAB Deadband	10.000 %
MMXU1: PPV phsBC Deadband	10.000 %
MMXU1: PPV phsCA Deadband	10.000 %
MMXU1: PhV phsA Deadband	10.000 %
MMXU1: PhV phsB Deadband	10.000 %
MMXU1: PhV phsC Deadband	10.000 %
MMXU1: A phsA Deadband	10.000 %
MMXU1: A phsB Deadband	10.000 %
MMXU1: A phsC Deadband	10.000 %
MMXU1: A neut Deadband	10.000 %
MMXU1: W phsA Deadband	10.000 %
MMXU1: W phsB Deadband	10.000 %
MMXU1: W phsC Deadband	10.000 %
MMXU1: VAr phsA Deadband	10.000 %
MMXU1: VAr phsB Deadband	10.000 %
MMXU1: VAr phsC Deadband	10.000 %
MMXU1: VA phsA Deadband	10.000 %
MMXU1: VA phsB Deadband	10.000 %
MMXU1: VA phsC Deadband	10.000 %
MMXU1: PF phsA Deadband	10.000 %
MMXU1: PF phsB Deadband	10.000 %
MMXU1: PF phsC Deadband	10.000 %
MMXU2: TotW Deadband	10.000 %
MMXU2: TotVAr Deadband	10.000 %
MMXU2: TotVA Deadband	10.000 %
MMXU2: TotPF Deadband	10.000 %
MMXU2: Hz Deadband	10.000 %
MMXU2: PPV phsAB Deadband	10.000 %
MMXU2: PPV phsBC Deadband	10.000 %
MMXU2: PPV phsCA Deadband	10.000 %
MMXU2: PhV phsA Deadband	10.000 %
MMXU2: PhV phsB Deadband	10.000 %
MMXU2: PhV phsC Deadband	10.000 %
MMXU2: A phsA Deadband	10.000 %
MMXU2: A phsB Deadband	10.000 %
MMXU2: A phsC Deadband	10.000 %
MMXU2: A neut Deadband	10.000 %
MMXU2: W phsA Deadband	10.000 %
MMXU2: W phsB Deadband	10.000 %
MMXU2: W phsC Deadband	10.000 %
MMXU2: VAr phsA Deadband	10.000 %
MMXU2: VAr phsB Deadband	10.000 %
MMXU2: VAr phsC Deadband	10.000 %
MMXU2: VA phsA Deadband	10.000 %
MMXU2: VA phsB Deadband	10.000 %
MMXU2: VA phsC Deadband	10.000 %
MMXU2: PF phsA Deadband	10.000 %

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VERSION: 5.7X
UR SERIAL NUMBER: AE5C09000046
SETTINGS SEND TO RELAY: SATURDAY, FEBRUARY 07, 2015 08:50:11
DESCRIPTION: (NONE)
TEXT COLOR

MMXU DEADBANDS (continued from last page)

MMXU2: PF phsB Deadband	10.000 %
MMXU2: PF phsC Deadband	10.000 %

GGIO1 STATUS CONFIGURATION

Number of Status Points	8

GGIO2 CONTROL CONFIGURATION

SPCSO 1 ctlModel	1
SPCSO 2 ctlModel	1
SPCSO 3 ctlModel	1
SPCSO 4 ctlModel	1
SPCSO 5 ctlModel	1
SPCSO 6 ctlModel	1
SPCSO 7 ctlModel	1
SPCSO 8 ctlModel	1
SPCSO 9 ctlModel	1
SPCSO 10 ctlModel	1
SPCSO 11 ctlModel	1
SPCSO 12 ctlModel	1
SPCSO 13 ctlModel	1
SPCSO 14 ctlModel	1
SPCSO 15 ctlModel	1
SPCSO 16 ctlModel	1
SPCSO 17 ctlModel	1
SPCSO 18 ctlModel	1
SPCSO 19 ctlModel	1
SPCSO 20 ctlModel	1
SPCSO 21 ctlModel	1
SPCSO 22 ctlModel	1
SPCSO 23 ctlModel	1
SPCSO 24 ctlModel	1
SPCSO 25 ctlModel	1
SPCSO 26 ctlModel	1
SPCSO 27 ctlModel	1
SPCSO 28 ctlModel	1
SPCSO 29 ctlModel	1
SPCSO 30 ctlModel	1
SPCSO 31 ctlModel	1
SPCSO 32 ctlModel	1
SPCSO 33 ctlModel	1
SPCSO 34 ctlModel	1
SPCSO 35 ctlModel	1
SPCSO 36 ctlModel	1
SPCSO 37 ctlModel	1
SPCSO 38 ctlModel	1
SPCSO 39 ctlModel	1
SPCSO 40 ctlModel	1
SPCSO 41 ctlModel	1
SPCSO 42 ctlModel	1
SPCSO 43 ctlModel	1
SPCSO 44 ctlModel	1
SPCSO 45 ctlModel	1
SPCSO 46 ctlModel	1
SPCSO 47 ctlModel	1
SPCSO 48 ctlModel	1
SPCSO 49 ctlModel	1
SPCSO 50 ctlModel	1
SPCSO 51 ctlModel	1
SPCSO 52 ctlModel	1
SPCSO 53 ctlModel	1
SPCSO 54 ctlModel	1
SPCSO 55 ctlModel	1
SPCSO 56 ctlModel	1
SPCSO 57 ctlModel	1
SPCSO 58 ctlModel	1

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DEVICE DEFINITION
FILES
ORDER CODE: D60-K03-HCH-F8L-H6U-M6U-P6U-U6U-W6T
VERSION: 5.7X
UR SERIAL NUMBER: AE5C09000046
SETTINGS SEND TO RELAY: SATURDAY, FEBRUARY 07, 2015 08:50:11
DESCRIPTION: (NONE)
TEXT COLOR

GGIO2 CONTROL CONFIGURATION (continued from last page)

SPCSO 59 ctlModel	1
SPCSO 60 ctlModel	1
SPCSO 61 ctlModel	1
SPCSO 62 ctlModel	1
SPCSO 63 ctlModel	1
SPCSO 64 ctlModel	1

GGIO4 ANALOG CONFIGURATION

IEC61850 GGIO4 Analogs	4
IEC61850 GGIO4 Analog 1 Value	OFF
IEC61850 GGIO4 Analog 1 db	100.000 %
IEC61850 GGIO4 Analog 1 min	0.000
IEC61850 GGIO4 Analog 1 max	1000000.000
IEC61850 GGIO4 Analog 2 Value	OFF
IEC61850 GGIO4 Analog 2 db	100.000 %
IEC61850 GGIO4 Analog 2 min	0.000
IEC61850 GGIO4 Analog 2 max	1000000.000
IEC61850 GGIO4 Analog 3 Value	OFF
IEC61850 GGIO4 Analog 3 db	100.000 %
IEC61850 GGIO4 Analog 3 min	0.000
IEC61850 GGIO4 Analog 3 max	1000000.000
IEC61850 GGIO4 Analog 4 Value	OFF
IEC61850 GGIO4 Analog 4 db	100.000 %
IEC61850 GGIO4 Analog 4 min	0.000
IEC61850 GGIO4 Analog 4 max	1000000.000
IEC61850 GGIO4 Analog 5 Value	OFF
IEC61850 GGIO4 Analog 5 db	100.000 %
IEC61850 GGIO4 Analog 5 min	0.000
IEC61850 GGIO4 Analog 5 max	1000000.000
IEC61850 GGIO4 Analog 6 Value	OFF
IEC61850 GGIO4 Analog 6 db	100.000 %
IEC61850 GGIO4 Analog 6 min	0.000
IEC61850 GGIO4 Analog 6 max	1000000.000
IEC61850 GGIO4 Analog 7 Value	OFF
IEC61850 GGIO4 Analog 7 db	100.000 %
IEC61850 GGIO4 Analog 7 min	0.000
IEC61850 GGIO4 Analog 7 max	1000000.000
IEC61850 GGIO4 Analog 8 Value	OFF
IEC61850 GGIO4 Analog 8 db	100.000 %
IEC61850 GGIO4 Analog 8 min	0.000
IEC61850 GGIO4 Analog 8 max	1000000.000
IEC61850 GGIO4 Analog 9 Value	OFF
IEC61850 GGIO4 Analog 9 db	100.000 %
IEC61850 GGIO4 Analog 9 min	0.000
IEC61850 GGIO4 Analog 9 max	1000000.000
IEC61850 GGIO4 Analog 10 Value	OFF
IEC61850 GGIO4 Analog 10 db	100.000 %
IEC61850 GGIO4 Analog 10 min	0.000
IEC61850 GGIO4 Analog 10 max	1000000.000
IEC61850 GGIO4 Analog 11 Value	OFF
IEC61850 GGIO4 Analog 11 db	100.000 %
IEC61850 GGIO4 Analog 11 min	0.000
IEC61850 GGIO4 Analog 11 max	1000000.000
IEC61850 GGIO4 Analog 12 Value	OFF
IEC61850 GGIO4 Analog 12 db	100.000 %
IEC61850 GGIO4 Analog 12 min	0.000
IEC61850 GGIO4 Analog 12 max	1000000.000
IEC61850 GGIO4 Analog 13 Value	OFF
IEC61850 GGIO4 Analog 13 db	100.000 %
IEC61850 GGIO4 Analog 13 min	0.000
IEC61850 GGIO4 Analog 13 max	1000000.000
IEC61850 GGIO4 Analog 14 Value	OFF
IEC61850 GGIO4 Analog 14 db	100.000 %
IEC61850 GGIO4 Analog 14 min	0.000
IEC61850 GGIO4 Analog 14 max	1000000.000

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DEVICE DEFINITION
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VERSION: 5.7X
UR SERIAL NUMBER: AE5C09000046
SETTINGS SEND TO RELAY: SATURDAY, FEBRUARY 07, 2015 08:50:11
DESCRIPTION: (NONE)
TEXT COLOR

GGIO4 ANALOG CONFIGURATION (continued from last page)

IEC61850 GGIO4 Analog 15 Value	OFF
IEC61850 GGIO4 Analog 15 db	100.000 %
IEC61850 GGIO4 Analog 15 min	0.000
IEC61850 GGIO4 Analog 15 max	1000000.000
IEC61850 GGIO4 Analog 16 Value	OFF
IEC61850 GGIO4 Analog 16 db	100.000 %
IEC61850 GGIO4 Analog 16 min	0.000
IEC61850 GGIO4 Analog 16 max	1000000.000
IEC61850 GGIO4 Analog 17 Value	OFF
IEC61850 GGIO4 Analog 17 db	100.000 %
IEC61850 GGIO4 Analog 17 min	0.000
IEC61850 GGIO4 Analog 17 max	1000000.000
IEC61850 GGIO4 Analog 18 Value	OFF
IEC61850 GGIO4 Analog 18 db	100.000 %
IEC61850 GGIO4 Analog 18 min	0.000
IEC61850 GGIO4 Analog 18 max	1000000.000
IEC61850 GGIO4 Analog 19 Value	OFF
IEC61850 GGIO4 Analog 19 db	100.000 %
IEC61850 GGIO4 Analog 19 min	0.000
IEC61850 GGIO4 Analog 19 max	1000000.000
IEC61850 GGIO4 Analog 20 Value	OFF
IEC61850 GGIO4 Analog 20 db	100.000 %
IEC61850 GGIO4 Analog 20 min	0.000
IEC61850 GGIO4 Analog 20 max	1000000.000
IEC61850 GGIO4 Analog 21 Value	OFF
IEC61850 GGIO4 Analog 21 db	100.000 %
IEC61850 GGIO4 Analog 21 min	0.000
IEC61850 GGIO4 Analog 21 max	1000000.000
IEC61850 GGIO4 Analog 22 Value	OFF
IEC61850 GGIO4 Analog 22 db	100.000 %
IEC61850 GGIO4 Analog 22 min	0.000
IEC61850 GGIO4 Analog 22 max	1000000.000
IEC61850 GGIO4 Analog 23 Value	OFF
IEC61850 GGIO4 Analog 23 db	100.000 %
IEC61850 GGIO4 Analog 23 min	0.000
IEC61850 GGIO4 Analog 23 max	1000000.000
IEC61850 GGIO4 Analog 24 Value	OFF
IEC61850 GGIO4 Analog 24 db	100.000 %
IEC61850 GGIO4 Analog 24 min	0.000
IEC61850 GGIO4 Analog 24 max	1000000.000
IEC61850 GGIO4 Analog 25 Value	OFF
IEC61850 GGIO4 Analog 25 db	100.000 %
IEC61850 GGIO4 Analog 25 min	0.000
IEC61850 GGIO4 Analog 25 max	1000000.000
IEC61850 GGIO4 Analog 26 Value	OFF
IEC61850 GGIO4 Analog 26 db	100.000 %
IEC61850 GGIO4 Analog 26 min	0.000
IEC61850 GGIO4 Analog 26 max	1000000.000
IEC61850 GGIO4 Analog 27 Value	OFF
IEC61850 GGIO4 Analog 27 db	100.000 %
IEC61850 GGIO4 Analog 27 min	0.000
IEC61850 GGIO4 Analog 27 max	1000000.000
IEC61850 GGIO4 Analog 28 Value	OFF
IEC61850 GGIO4 Analog 28 db	100.000 %
IEC61850 GGIO4 Analog 28 min	0.000
IEC61850 GGIO4 Analog 28 max	1000000.000
IEC61850 GGIO4 Analog 29 Value	OFF
IEC61850 GGIO4 Analog 29 db	100.000 %
IEC61850 GGIO4 Analog 29 min	0.000
IEC61850 GGIO4 Analog 29 max	1000000.000
IEC61850 GGIO4 Analog 30 Value	OFF
IEC61850 GGIO4 Analog 30 db	100.000 %
IEC61850 GGIO4 Analog 30 min	0.000
IEC61850 GGIO4 Analog 30 max	1000000.000
IEC61850 GGIO4 Analog 31 Value	OFF

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VERSION: 5.7X
UR SERIAL NUMBER: AE5C09000046
SETTINGS SEND TO RELAY: SATURDAY, FEBRUARY 07, 2015 08:50:11
DESCRIPTION: (NONE)
TEXT COLOR

GGIO4 ANALOG CONFIGURATION (continued from last page)

IEC61850 GGIO4 Analog 31 db	100.000 %
IEC61850 GGIO4 Analog 31 min	0.000
IEC61850 GGIO4 Analog 31 max	1000000.000
IEC61850 GGIO4 Analog 32 Value	OFF
IEC61850 GGIO4 Analog 32 db	100.000 %
IEC61850 GGIO4 Analog 32 min	0.000
IEC61850 GGIO4 Analog 32 max	1000000.000

REPORT CONTROL CONFIGURATION

REPORT 1 (GGIO1.BR): RptID	
REPORT 1 (GGIO1.BR): OptFlds	0
REPORT 1 (GGIO1.BR): BufTm	0
REPORT 1 (GGIO1.BR): TrgOps	0
REPORT 1 (GGIO1.BR): IntgPd	0
REPORT 2 (GGIO1.BR01): RptID	
REPORT 2 (GGIO1.BR01): OptFlds	0
REPORT 2 (GGIO1.BR01): BufTm	0
REPORT 2 (GGIO1.BR01): TrgOps	0
REPORT 2 (GGIO1.BR01): IntgPd	0
REPORT 3 (GGIO1.RP): RptID	
REPORT 3 (GGIO1.RP): OptFlds	0
REPORT 3 (GGIO1.RP): BufTm	0
REPORT 3 (GGIO1.RP): TrgOps	0
REPORT 3 (GGIO1.RP): IntgPd	0
REPORT 4 (GGIO4.RP): RptID	
REPORT 4 (GGIO4.RP): OptFlds	0
REPORT 4 (GGIO4.RP): BufTm	0
REPORT 4 (GGIO4.RP): TrgOps	0
REPORT 4 (GGIO4.RP): IntgPd	0
REPORT 5 (MMXU1.BR): RptID	
REPORT 5 (MMXU1.BR): OptFlds	0
REPORT 5 (MMXU1.BR): BufTm	0
REPORT 5 (MMXU1.BR): TrgOps	0
REPORT 5 (MMXU1.BR): IntgPd	0
REPORT 6 (MMXU1.RP): RptID	
REPORT 6 (MMXU1.RP): OptFlds	0
REPORT 6 (MMXU1.RP): BufTm	0
REPORT 6 (MMXU1.RP): TrgOps	0
REPORT 6 (MMXU1.RP): IntgPd	0
REPORT 7 (MMXU2.BR): RptID	
REPORT 7 (MMXU2.BR): OptFlds	0
REPORT 7 (MMXU2.BR): BufTm	0
REPORT 7 (MMXU2.BR): TrgOps	0
REPORT 7 (MMXU2.BR): IntgPd	0
REPORT 8 (MMXU2.RP): RptID	
REPORT 8 (MMXU2.RP): OptFlds	0
REPORT 8 (MMXU2.RP): BufTm	0
REPORT 8 (MMXU2.RP): TrgOps	0
REPORT 8 (MMXU2.RP): IntgPd	0

XCBR CONFIGURATION

XCBR1 ST.Loc Operand	OFF
Clear XCBR1 OpCnt	No
XCBR2 ST.Loc Operand	OFF
Clear XCBR2 OpCnt	No

XSWI CONFIGURATION

XSWI1 ST.Loc Operand	OFF
XSWI2 ST.Loc Operand	OFF
XSWI3 ST.Loc Operand	OFF
XSWI4 ST.Loc Operand	OFF
XSWI5 ST.Loc Operand	OFF
XSWI6 ST.Loc Operand	OFF
XSWI7 ST.Loc Operand	OFF
XSWI8 ST.Loc Operand	OFF

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DEVICE DEFINITION
FILES
ORDER CODE: D60-K03-HCH-F8L-H6U-M6U-P6U-U6U-W6T
VERSION: 5.7X
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SETTINGS SEND TO RELAY: SATURDAY, FEBRUARY 07, 2015 08:50:11
DESCRIPTION: (NONE)
TEXT COLOR

XSWI CONFIGURATION (continued from last page)

Clear XSWI1 OpCnt	No
Clear XSWI2 OpCnt	No
Clear XSWI3 OpCnt	No
Clear XSWI4 OpCnt	No
Clear XSWI5 OpCnt	No
Clear XSWI6 OpCnt	No
Clear XSWI7 OpCnt	No
Clear XSWI8 OpCnt	No

HTTP

HTTP TCP Port Number	80

TFTP

TFTP Main UDP Port Number	69
TFTP Data UDP Port Number 1	0
TFTP Data UDP Port Number 2	0

SNTP

Function	Enabled
Server IP Address	192.168.104.105
UDP Port Number	123

REAL TIME CLOCK

IRIG-B Signal Type	None
Real Time Clock Events	Disabled
Time Zone Offset	-4.0 hr
DST Function	Enabled
DST Start Month	October
DST Start Day	Saturday
DST Start Day Instance	Second
DST Start Hour	0
DST Stop Month	March
DST Stop Day	Saturday
DST Stop Day Instance	Second
DST Stop Hour	0

FAULT REPORT

Fault Report 1 Source	SRC 1 (SRC 1)
Fault Report 1 Trigger	TRIP OUTPUT OP
Fault Report 1 Positive Seq (Z1) Mag	33.82 ohms
Fault Report 1 Positive Seq (Z1) Angle	77 deg
Fault Report 1 Zero Seq (Z0) Mag	33.82 ohms
Fault Report 1 Zero Seq (Z0) Angle	77 deg
Fault Report 1 Line Length Units	km
Fault Report 1 Line Length	110.9
Fault Report 1 VT Substitution	None
Fault Report 1 System Z0 Mag	2.00 ohms
Fault Report 1 System Z0 Angle	75 deg

OSCILLOGRAPHY

Number Of Records	5
Trigger Mode	Automatic Overwrite
Trigger Position	30 %
Trigger Source	Osc Trigger On (VO64)
AC Input Waveforms	32 samples/cycle
Digital Channel 1	PH DIR1 BLK
Digital Channel 2	PH DIST Z1 OP
Digital Channel 3	GND DIST Z1 OP
Digital Channel 4	PH DIST Z2 OP
Digital Channel 5	GND DIST Z2 OP
Digital Channel 6	PH DIST Z3 OP
Digital Channel 7	GND DIST Z3 OP
Digital Channel 8	PH DIST Z4 OP
Digital Channel 9	GND DIST Z4 OP
Digital Channel 10	PH DIST Z5 OP

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OSCILLOGRAPHY (continued from last page)

Digital Channel 11	GND DIST Z5 OP
Digital Channel 12	LINE PICKUP OP
Digital Channel 13	POWER SWING BLOCK
Digital Channel 14	NEUTRAL TOC1 OP
Digital Channel 15	PHASE TOC1 OP
Digital Channel 16	NEUTRAL TOC2 OP
Digital Channel 17	52A9 Abierto On(M7a)
Digital Channel 18	Falla TP Lin On(U7a)
Digital Channel 19	Rx. 85A1 On(U8a)
Digital Channel 20	POTT TX1
Digital Channel 21	Rx. 85D On(U8c)
Digital Channel 22	BKR FAIL 1 T1 OP
Digital Channel 23	BKR FAIL 1 RETRIP
Digital Channel 24	AR CLOSE BKR 1
Digital Channel 25	AR DISABLED
Digital Channel 26	OPEN POLE OP A
Digital Channel 27	OPEN POLE OP B
Digital Channel 28	OPEN POLE OP C
Digital Channel 29	OPEN POLE OP
Digital Channel 30	LED ECHO On (VO15)
Digital Channel 31	NEG SEQ DIR OC1 FWD
Digital Channel 32	NEG SEQ DIR OC1 REV
Digital Channel 33	TRIP OUTPUT OP
Digital Channel 34	TRIP PHASE A
Digital Channel 35	TRIP PHASE B
Digital Channel 36	TRIP PHASE C
Digital Channel 38	SRC1 VT FUSE FAIL OP
Digital Channel 39	Rx. 85A2 On(W7c)
Digital Channel 40	Emision 85A On (VO24)
Analog Channel 1	SRC1 Ia RMS
Analog Channel 2	SRC1 Ib RMS
Analog Channel 3	SRC1 Ic RMS
Analog Channel 4	SRC1 In RMS
Analog Channel 5	SRC1 Vag RMS
Analog Channel 6	SRC1 Vbg RMS
Analog Channel 7	SRC1 Vcg RMS
Analog Channel 8	SRC1 Frequency
Analog Channel 9	SRC1 V_0 Mag
Analog Channel 10	SRC1 I_0 Mag
Analog Channel 11	SRC1 V_2 Mag
Analog Channel 12	SRC1 I_2 Mag
Analog Channel 13	SRC1 V_1 Mag
Analog Channel 14	SRC1 I_1 Mag
Analog Channel 15	SRC2 Vx RMS
Analog Channel 16	Tracking Frequency

DATA LOGGER

Data Logger Mode	Continuous
Data Logger Trigger	OFF
Rate	60000 msec

USER-PROGRAMMABLE LEDS

USER PROGRAMMABLE LEDS

LED 1: OPERAND	LED Z1 Op. On (VO9)
LED 1: TYPE	Latched
LED 2: OPERAND	LED Z1B Op. On (VO10)
LED 2: TYPE	Latched
LED 3: OPERAND	LED Z2 Op. On (VO11)
LED 3: TYPE	Latched
LED 4: OPERAND	LED Z3 Op. On (VO12)
LED 4: TYPE	Latched
LED 5: OPERAND	LED Z4 Op. On (VO13)
LED 5: TYPE	Latched
LED 6: OPERAND	LINE PICKUP OP
LED 6: TYPE	Latched

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USER PROGRAMMABLE LEDS (continued from last page)

LED 7: OPERAND	LED 67N On (VO16)
LED 7: TYPE	Latched
LED 8: OPERAND	LED 51-51N On (VO14)
LED 8: TYPE	Latched
LED 9: OPERAND	BKR FAIL 1 T1 OP
LED 9: TYPE	Latched
LED 10: OPERAND	POWER SWING BLOCK
LED 10: TYPE	Latched
LED 11: OPERAND	LED ECHO On (VO15)
LED 11: TYPE	Latched
LED 12: OPERAND	52A9 Abierto On(M7a)
LED 12: TYPE	Self-Reset
LED 13: OPERAND	Rx. 85A1 On(U8a)
LED 13: TYPE	Latched
LED 14: OPERAND	Rx. 85A2 On(W7c)
LED 14: TYPE	Latched
LED 15: OPERAND	HYBRID POTT TX1
LED 15: TYPE	Latched
LED 16: OPERAND	Tx. 85D On (VO22)
LED 16: TYPE	Latched
LED 17: OPERAND	Blq.21Z1 21N On (VO2)
LED 17: TYPE	Self-Reset
LED 18: OPERAND	Start 50BF On (VO4)
LED 18: TYPE	Latched
LED 19: OPERAND	AR CLOSE BKR 1
LED 19: TYPE	Latched
LED 20: OPERAND	Bloq. 79 On (VO6)
LED 20: TYPE	Self-Reset
LED 21: OPERAND	P.Cort. Abie On(M8a)
LED 21: TYPE	Self-Reset
LED 22: OPERAND	DNP INC PCOR On (VO61)
LED 22: TYPE	Self-Reset

USER-PROGRAMMABLE SELF TESTS

Remote Device Off Function	Enabled
Battery Fail Function	Enabled
SNTP Fail Function	Enabled
IRIG B Fail Function	Enabled

USER-DEFINABLE DISPLAYS

USER DISPLAY 1: Top Line	LIN. PTA CORTES 1 A9
USER DISPLAY 1: Bottom Line	SISTEMA 2
USER DISPLAY 1: Item 1	0
USER DISPLAY 1: Item 2	0
USER DISPLAY 1: Item 3	0
USER DISPLAY 1: Item 4	0
USER DISPLAY 1: Item 5	0
USER DISPLAY 2: Top Line	POTENCIA ACTIVA
USER DISPLAY 2: Bottom Line	~1
USER DISPLAY 2: Item 1	7168
USER DISPLAY 2: Item 2	0
USER DISPLAY 2: Item 3	0
USER DISPLAY 2: Item 4	0
USER DISPLAY 2: Item 5	0
USER DISPLAY 3: Top Line	POTENCIA REACTIVA
USER DISPLAY 3: Bottom Line	~1
USER DISPLAY 3: Item 1	7176
USER DISPLAY 3: Item 2	0
USER DISPLAY 3: Item 3	0
USER DISPLAY 3: Item 4	0
USER DISPLAY 3: Item 5	0
USER DISPLAY 4: Top Line	CORRIENTE FASE A
USER DISPLAY 4: Bottom Line	~1
USER DISPLAY 4: Item 1	6144
USER DISPLAY 4: Item 2	0

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USER-DEFINABLE DISPLAYS (continued from last page)

USER DISPLAY 4: Item 3	0
USER DISPLAY 4: Item 4	0
USER DISPLAY 4: Item 5	0
USER DISPLAY 5: Top Line	CORRIENTE FASE B
USER DISPLAY 5: Bottom Line	~1
USER DISPLAY 5: Item 1	6146
USER DISPLAY 5: Item 2	0
USER DISPLAY 5: Item 3	0
USER DISPLAY 5: Item 4	0
USER DISPLAY 5: Item 5	0
USER DISPLAY 6: Top Line	CORRIENTE FASE C
USER DISPLAY 6: Bottom Line	~1
USER DISPLAY 6: Item 1	6148
USER DISPLAY 6: Item 2	0
USER DISPLAY 6: Item 3	0
USER DISPLAY 6: Item 4	0
USER DISPLAY 6: Item 5	0
USER DISPLAY 7: Top Line	TENSION VAB
USER DISPLAY 7: Bottom Line	~1
USER DISPLAY 7: Item 1	6671
USER DISPLAY 7: Item 2	0
USER DISPLAY 7: Item 3	0
USER DISPLAY 7: Item 4	0
USER DISPLAY 7: Item 5	0
USER DISPLAY 8: Top Line	TENSION VBC
USER DISPLAY 8: Bottom Line	~1
USER DISPLAY 8: Item 1	6673
USER DISPLAY 8: Item 2	0
USER DISPLAY 8: Item 3	0
USER DISPLAY 8: Item 4	0
USER DISPLAY 8: Item 5	0
USER DISPLAY 9: Top Line	TENSION VCA
USER DISPLAY 9: Bottom Line	~1
USER DISPLAY 9: Item 1	6675
USER DISPLAY 9: Item 2	0
USER DISPLAY 9: Item 3	0
USER DISPLAY 9: Item 4	0
USER DISPLAY 9: Item 5	0
USER DISPLAY 10: Top Line	DISTANCIA DE FALLA
USER DISPLAY 10: Bottom Line	~1 ~2
USER DISPLAY 10: Item 1	9061
USER DISPLAY 10: Item 2	37382
USER DISPLAY 10: Item 3	0
USER DISPLAY 10: Item 4	0
USER DISPLAY 10: Item 5	0
Invoke and Scroll	ON

INSTALLATION

Relay Name	52A9_D60

SYSTEM SETUP

AC INPUTS

CURRENT

CT F1: Phase CT Primary	1000 A
CT F1: Phase CT Secondary	1 A
CT F1: Ground CT Primary	1000 A
CT F1: Ground CT Secondary	1 A

VOLTAGE

VT F5: Phase VT Connection	Wye
VT F5: Phase VT Secondary	66.4 V
VT F5: Phase VT Ratio	1339.13 :1
VT F5: Auxiliary VT Connection	Vbg
VT F5: Auxiliary VT Secondary	66.4 V
VT F5: Auxiliary VT Ratio	1339.13 :1

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POWER SYSTEM

Nominal Frequency	50 Hz
Phase Rotation	ABC
Frequency And Phase Reference	SRC 1 (SRC 1)
Frequency Tracking Function	Enabled

SIGNAL SOURCES

SOURCE 1: Name	SRC 1
SOURCE 1: Phase CT	F1
SOURCE 1: Ground CT	F1
SOURCE 1: Phase VT	F5
SOURCE 1: Auxiliary VT	None
SOURCE 2: Name	SRC 2
SOURCE 2: Phase CT	None
SOURCE 2: Ground CT	None
SOURCE 2: Phase VT	None
SOURCE 2: Auxiliary VT	F5

BREAKERS

Breaker 1 Function	Enabled
Breaker 1 Push Button Control	Disabled
Breaker 1 Name	52A9
Breaker 1 Mode	1-Pole
Breaker 1 Open	OFF
Breaker 1 Block Open	OFF
Breaker 1 Close	OFF
Breaker 1 Block Close	OFF
Breaker 1 Phase A/3-Pole Closed	Polo 1 cerr On(H7c)
Breaker 1 Phase A/3-Pole Opened	52A9 Abierto On(M7a)
Breaker 1 Phase B Closed	Polo 2 cerr On(H8a)
Breaker 1 Phase B Opened	OFF
Breaker 1 Phase C Closed	Polo 3 cerr On(H8c)
Breaker 1 Phase C Opened	OFF
Breaker 1 Toperate	0.070 s
Breaker 1 External Alarm	OFF
Breaker 1 Alarm Delay	0.000 s
Breaker 1 Manual Close Recal Time	0.000 s
Breaker 1 Out Of Service	OFF
Breaker 1 Events	Disabled

FLEXLOGIC

FLEXLOGIC EQUATION EDITOR

FlexLogic Entry 1	AR CLOSE BKR 1
FlexLogic Entry 2	POSITIVE ONE SHOT
FlexLogic Entry 3	BKR FAIL 1 T1 OP
FlexLogic Entry 4	POSITIVE ONE SHOT
FlexLogic Entry 5	POWER SWING BLOCK
FlexLogic Entry 6	POSITIVE ONE SHOT
FlexLogic Entry 7	TRIP OUTPUT OP
FlexLogic Entry 8	POSITIVE ONE SHOT
FlexLogic Entry 9	OR(4)
FlexLogic Entry 10	= Osc Trigger (VO64)
FlexLogic Entry 11	LINE PICKUP OP
FlexLogic Entry 12	PHASE TOC1 OP
FlexLogic Entry 13	PH DIST Z1 OP
FlexLogic Entry 14	PH DIST Z3 OP
FlexLogic Entry 15	PH DIST Z4 OP
FlexLogic Entry 16	PH DIST Z5 OP
FlexLogic Entry 17	GND DIST Z3 OP
FlexLogic Entry 18	GND DIST Z4 OP
FlexLogic Entry 19	GND DIST Z5 OP
FlexLogic Entry 20	NEUTRAL TOC1 OP
FlexLogic Entry 21	NEUTRAL TOC2 OP
FlexLogic Entry 22	HYBRID POTT OP
FlexLogic Entry 23	Trip 85D On (VO5)

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FLEXLOGIC EQUATION EDITOR (continued from last page)

FlexLogic Entry 24	OR(13)
FlexLogic Entry 25	= Trip 3p (VO1)
FlexLogic Entry 26	SRC1 VT FUSE FAIL OP
FlexLogic Entry 27	Falla TP Lin On(U7a)
FlexLogic Entry 28	OR(2)
FlexLogic Entry 29	= Blq.21Z1 21N (VO2)
FlexLogic Entry 30	Blq.21Z1 21N On (VO2)
FlexLogic Entry 31	POWER SWING BLOCK
FlexLogic Entry 32	OR(2)
FlexLogic Entry 33	= Blq.21Z2-Z5 (VO3)
FlexLogic Entry 34	TRIP OUTPUT OP
FlexLogic Entry 35	Op. 86B On(P8c)
FlexLogic Entry 36	Trip 85D On (VO5)
FlexLogic Entry 37	Start BF 87B On(W7a)
FlexLogic Entry 38	OR(4)
FlexLogic Entry 39	= Start 50BF (VO4)
FlexLogic Entry 40	P.Cort. Abie On(M8a)
FlexLogic Entry 41	NOT
FlexLogic Entry 42	P.Cort. Cerr On(M8c)
FlexLogic Entry 43	Rx. 85D On(U8c)
FlexLogic Entry 44	AND(3)
FlexLogic Entry 45	= Trip 85D (VO5)
FlexLogic Entry 46	52 apto On(H7a)
FlexLogic Entry 47	NOT
FlexLogic Entry 48	Hab. Reconex On(W5a)
FlexLogic Entry 49	NOT
FlexLogic Entry 50	Rec. en prog On(P7a)
FlexLogic Entry 51	Bloq. 79 p43 On(P7c)
FlexLogic Entry 52	Op. 86B On(P8c)
FlexLogic Entry 53	OR(5)
FlexLogic Entry 54	= Bloq. 79 (VO6)
FlexLogic Entry 55	OPEN POLE OP A
FlexLogic Entry 56	OPEN POLE OP B
FlexLogic Entry 57	OPEN POLE OP C
FlexLogic Entry 58	AND(3)
FlexLogic Entry 59	= Open 3p (VO7)
FlexLogic Entry 60	SRC1 VT FUSE FAIL OP
FlexLogic Entry 61	Falla TP Lin On(U7a)
FlexLogic Entry 62	OR(2)
FlexLogic Entry 63	NOT
FlexLogic Entry 64	= VT ok (VO8)
FlexLogic Entry 65	PH DIST Z1 OP
FlexLogic Entry 66	GND DIST Z1 OP
FlexLogic Entry 67	OR(2)
FlexLogic Entry 68	= LED Z1 Op. (VO9)
FlexLogic Entry 69	PH DIST Z2 OP
FlexLogic Entry 70	GND DIST Z2 OP
FlexLogic Entry 71	OR(2)
FlexLogic Entry 72	= LED Z1B Op. (VO10)
FlexLogic Entry 73	PH DIST Z3 OP
FlexLogic Entry 74	GND DIST Z3 OP
FlexLogic Entry 75	OR(2)
FlexLogic Entry 76	= LED Z2 Op. (VO11)
FlexLogic Entry 77	PH DIST Z4 OP
FlexLogic Entry 78	GND DIST Z4 OP
FlexLogic Entry 79	OR(2)
FlexLogic Entry 80	= LED Z3 Op. (VO12)
FlexLogic Entry 81	PH DIST Z5 OP
FlexLogic Entry 82	GND DIST Z5 OP
FlexLogic Entry 83	OR(2)
FlexLogic Entry 84	= LED Z4 Op. (VO13)
FlexLogic Entry 85	PHASE TOC1 OP
FlexLogic Entry 86	NEUTRAL TOC1 OP
FlexLogic Entry 87	OR(2)
FlexLogic Entry 88	= LED 51-51N (VO14)

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FLEXLOGIC EQUATION EDITOR (continued from last page)

FlexLogic Entry 89	Rx. 85A2 On(W7c)
FlexLogic Entry 90	Rx. 85A1 On(U8a)
FlexLogic Entry 91	AND(2)
FlexLogic Entry 92	Open 3p On (VO7)
FlexLogic Entry 93	HYBRID POTT TX1
FlexLogic Entry 94	AND(3)
FlexLogic Entry 95	= LED ECHO (VO15)
FlexLogic Entry 96	NEUTRAL TOC2 OP
FlexLogic Entry 97	VT ok On (VO8)
FlexLogic Entry 98	AND(2)
FlexLogic Entry 99	= LED 67N (VO16)
FlexLogic Entry 100	PH DIST Z1 OP
FlexLogic Entry 101	HYBRID POTT OP
FlexLogic Entry 102	GND DIST Z1 OP
FlexLogic Entry 103	OR(3)
FlexLogic Entry 104	= AR 3P START (VO17)
FlexLogic Entry 105	Rx. 85A1 On(U8a)
FlexLogic Entry 106	Rx. 85A2 On(W7c)
FlexLogic Entry 107	AND(2)
FlexLogic Entry 108	= RX. 85A (VO21)
FlexLogic Entry 109	P.Cort. Abie On(M8a)
FlexLogic Entry 110	NOT
FlexLogic Entry 111	P.Cort. Cerr On(M8c)
FlexLogic Entry 112	BKR FAIL 1 T1 OP
FlexLogic Entry 113	AND(3)
FlexLogic Entry 114	= Tx. 85D (VO22)
FlexLogic Entry 115	DNP INC PCOR On (VO61)
FlexLogic Entry 116	P.Cort. Abie On(M8a)
FlexLogic Entry 117	OR(2)
FlexLogic Entry 118	= BLOCK HYBRID (VO23)
FlexLogic Entry 119	AR DISABLED
FlexLogic Entry 120	= DNP 79 BLOQ (VO30)
FlexLogic Entry 121	AR ENABLED
FlexLogic Entry 122	= DNP 79 ON (VO31)
FlexLogic Entry 123	Falla TP Lin On(U7a)
FlexLogic Entry 124	= DNP TP LINEA (VO32)
FlexLogic Entry 125	Falla TP Bar On(U7c)
FlexLogic Entry 126	= DNP TP BARRA (VO33)
FlexLogic Entry 127	Rx. 85A1 On(U8a)
FlexLogic Entry 128	= DNP RX RAN (VO34)
FlexLogic Entry 129	HYBRID POTT TX1
FlexLogic Entry 130	= DNP TX 85A (VO35)
FlexLogic Entry 131	Rx. 85A2 On(W7c)
FlexLogic Entry 132	= DNP RX JAH (VO36)
FlexLogic Entry 133	Rx. 85A1 On(U8a)
FlexLogic Entry 134	Rx. 85A2 On(W7c)
FlexLogic Entry 135	AND(2)
FlexLogic Entry 136	Open 3p On (VO7)
FlexLogic Entry 137	HYBRID POTT TX1
FlexLogic Entry 138	AND(3)
FlexLogic Entry 139	= DNP ECHO (VO37)
FlexLogic Entry 140	AR CLOSE BKR 1
FlexLogic Entry 141	= DNP 79 CLOSE (VO38)
FlexLogic Entry 142	PH DIST Z1 OP
FlexLogic Entry 143	PH DIST Z2 OP
FlexLogic Entry 144	PH DIST Z3 OP
FlexLogic Entry 145	PH DIST Z4 OP
FlexLogic Entry 146	GND DIST Z1 OP
FlexLogic Entry 147	GND DIST Z2 OP
FlexLogic Entry 148	GND DIST Z3 OP
FlexLogic Entry 149	GND DIST Z4 OP
FlexLogic Entry 150	OR(8)
FlexLogic Entry 151	= DNP 21/21N (VO39)
FlexLogic Entry 152	NEUTRAL TOC2 OP
FlexLogic Entry 153	= DNP 67N (VO40)

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TEXT COLOR

FLEXLOGIC EQUATION EDITOR (continued from last page)

FlexLogic Entry 154	BKR FAIL 1 T1 OP
FlexLogic Entry 155	= DNP 50BF (VO41)
FlexLogic Entry 156	PH DIST Z2 OP
FlexLogic Entry 157	GND DIST Z2 OP
FlexLogic Entry 158	OR(2)
FlexLogic Entry 159	= DNP Z1B (VO42)
FlexLogic Entry 160	PH DIST Z1 OP
FlexLogic Entry 161	GND DIST Z1 OP
FlexLogic Entry 162	OR(2)
FlexLogic Entry 163	= DNP Z1 (VO43)
FlexLogic Entry 164	PH DIST Z3 OP
FlexLogic Entry 165	GND DIST Z3 OP
FlexLogic Entry 166	OR(2)
FlexLogic Entry 167	= DNP Z2 (VO44)
FlexLogic Entry 168	PH DIST Z4 OP
FlexLogic Entry 169	GND DIST Z4 OP
FlexLogic Entry 170	OR(2)
FlexLogic Entry 171	= DNP Z3 (VO45)
FlexLogic Entry 172	PH DIST Z5 OP
FlexLogic Entry 173	GND DIST Z5 OP
FlexLogic Entry 174	OR(2)
FlexLogic Entry 175	= DNP Z4 (VO46)
FlexLogic Entry 176	PHASE TOC1 OP
FlexLogic Entry 177	NEUTRAL TOC1 OP
FlexLogic Entry 178	OR(2)
FlexLogic Entry 179	= DNP 51/51N (VO47)
FlexLogic Entry 180	TRIP PHASE A
FlexLogic Entry 181	= DNP TRIP A (VO48)
FlexLogic Entry 182	TRIP PHASE B
FlexLogic Entry 183	= DNP TRIP B (VO49)
FlexLogic Entry 184	TRIP PHASE C
FlexLogic Entry 185	= DNP TRIP C (VO50)
FlexLogic Entry 186	NEUTRAL TOC1 OP
FlexLogic Entry 187	NEUTRAL TOC2 OP
FlexLogic Entry 188	GND DIST Z1 OP
FlexLogic Entry 189	GND DIST Z2 OP
FlexLogic Entry 190	GND DIST Z3 OP
FlexLogic Entry 191	GND DIST Z4 OP
FlexLogic Entry 192	OR(6)
FlexLogic Entry 193	= DNP TRIP GND (VO51)
FlexLogic Entry 194	Trip polo 1 On(W5c)
FlexLogic Entry 195	Trip polo 2 On(W6a)
FlexLogic Entry 196	Trip polo 3 On(W6c)
FlexLogic Entry 197	OR(3)
FlexLogic Entry 198	= DNP TRIP S1 (VO52)
FlexLogic Entry 199	LED PICKUP
FlexLogic Entry 200	= DNP PICKUP (VO53)
FlexLogic Entry 201	SRC1 VT FUSE FAIL OP
FlexLogic Entry 202	Falla TP Lin On(U7a)
FlexLogic Entry 203	OR(2)
FlexLogic Entry 204	= DNP MOD EMER (VO54)
FlexLogic Entry 205	LINE PICKUP OP
FlexLogic Entry 206	= DNP SOTF (VO55)
FlexLogic Entry 207	SRC1 VT FUSE FAIL OP
FlexLogic Entry 208	= DNP VT FAIL (VO56)
FlexLogic Entry 209	POWER SWING BLOCK
FlexLogic Entry 210	= DNP PSWING (VO57)
FlexLogic Entry 211	52 apto On(H7a)
FlexLogic Entry 212	NOT
FlexLogic Entry 213	Hab. Reconex On(W5a)
FlexLogic Entry 214	NOT
FlexLogic Entry 215	Rec. en prog On(P7a)
FlexLogic Entry 216	Bloq. 79 p43 On(P7c)
FlexLogic Entry 217	Op. 86B On(P8c)
FlexLogic Entry 218	OR(5)

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VERSION: 5.7X
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SETTINGS SEND TO RELAY: SATURDAY, FEBRUARY 07, 2015 08:50:11
DESCRIPTION: (NONE)
TEXT COLOR

FLEXLOGIC EQUATION EDITOR (continued from last page)

FlexLogic Entry 219	= DNP 79BLQ EX (VO58)
FlexLogic Entry 220	Rx. 85D On(U8c)
FlexLogic Entry 221	= DNP RX85D (VO59)
FlexLogic Entry 222	BKR FAIL 1 T1 OP
FlexLogic Entry 223	= DNP TX85D (VO60)
FlexLogic Entry 224	P.Cort. Abie On(M8a)
FlexLogic Entry 225	P.Cort. Cerr On(M8c)
FlexLogic Entry 226	AND(2)
FlexLogic Entry 227	P.Cort. Abie Off(M8a)
FlexLogic Entry 228	P.Cort. Cerr Off(M8c)
FlexLogic Entry 229	AND(2)
FlexLogic Entry 230	OR(2)
FlexLogic Entry 231	= DNP INC PCOR (VO61)
FlexLogic Entry 232	HYBRID POTT TX1
FlexLogic Entry 233	TIMER 1
FlexLogic Entry 234	= Emision 85A (VO24)
FlexLogic Entry 235	GND DIST Z5 OP
FlexLogic Entry 236	PH DIST Z5 OP
FlexLogic Entry 237	OR(2)
FlexLogic Entry 238	= EDAG Z5 (VO65)
FlexLogic Entry 239	PH DIST Z3 PKP
FlexLogic Entry 240	= PKP Z3 (VO66)
FlexLogic Entry 241	RX. 85A On (VO21)
FlexLogic Entry 242	Open 3p On (VO7)
FlexLogic Entry 243	AND(2)
FlexLogic Entry 244	= ECHO TX (VO67)
FlexLogic Entry 245	END

FLEXLOGIC TIMERS

Timer 1: Type	millisecond
Timer 1: Pickup Delay	0
Timer 1: Dropout Delay	100

GROUPED ELEMENTS

GROUP 1

LINE PICKUP [GROUP 1]

Function	Enabled
Signal Source	SRC 1 (SRC 1)
Phase IOC Line Pickup	0.800 pu
UV Pickup	0.800 pu
Line End Open Pickup Delay	0.200 s
Line End Open Reset Delay	0.200 s
OV Pickup Delay	0.200 s
Autoreclose Coordination Bypass	Enabled
Autoreclose Coordination Pickup Delay	0.045 s
Autoreclose Coordination Reset Delay	0.005 s
Terminal Open	BREAKER 1 OPEN
AR Accelerate	OFF
Distance Trip	Enabled
Block	OFF
Target	Self-reset
Events	Enabled

DISTANCE

DISTANCE [GROUP 1]

Source	SRC 1 (SRC 1)
Memory Duration	10 cycles
Force Self-Polar	OFF
Force Mem-Polar	OFF

PHASE DISTANCE [GROUP 1]

PHASE DISTANCE Z1: Function	Enabled
PHASE DISTANCE Z1: Direction	Forward
PHASE DISTANCE Z1: Shape	Quad
PHASE DISTANCE Z1: Xfmr Vol Connection	None

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C:\USERS\MMISSENE\DESKTOP\MMM\ACTUALIZACIÝN CRAPS\TINGU\A9
DEVICE DEFINITION
FILES
ORDER CODE: D60-K03-HCH-F8L-H6U-M6U-P6U-U6U-W6T
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DESCRIPTION: (NONE)
TEXT COLOR

PHASE DISTANCE [GROUP 1] (continued from last page)

PHASE DISTANCE Z1: Xfmr Curr Connection	None
PHASE DISTANCE Z1: Reach	19.49 ohms
PHASE DISTANCE Z1: RCA	90 deg
PHASE DISTANCE Z1: Rev Reach	0.02 ohms
PHASE DISTANCE Z1: Rev Reach RCA	77 deg
PHASE DISTANCE Z1: Comp Limit	90 deg
PHASE DISTANCE Z1: DIR RCA	49 deg
PHASE DISTANCE Z1: DIR Comp Limit	71 deg
PHASE DISTANCE Z1: Quad Right Blinder	19.49 ohms
PHASE DISTANCE Z1: Quad Right Blinder RCA	77 deg
PHASE DISTANCE Z1: Quad Left Blinder	19.49 ohms
PHASE DISTANCE Z1: Quad Left Blinder RCA	77 deg
PHASE DISTANCE Z1: Supervision	0.100 pu
PHASE DISTANCE Z1: Volt Level	0.000 pu
PHASE DISTANCE Z1: Delay	0.000 s
PHASE DISTANCE Z1: Block	Blq.21Z1 21N On (VO2)
PHASE DISTANCE Z1: Target	Self-reset
PHASE DISTANCE Z1: Events	Enabled
PHASE DISTANCE Z2: Function	Enabled
PHASE DISTANCE Z2: Direction	Forward
PHASE DISTANCE Z2: Shape	Quad
PHASE DISTANCE Z2: Xfmr Vol Connection	None
PHASE DISTANCE Z2: Xfmr Curr Connection	None
PHASE DISTANCE Z2: Reach	68.18 ohms
PHASE DISTANCE Z2: RCA	90 deg
PHASE DISTANCE Z2: Rev Reach	0.02 ohms
PHASE DISTANCE Z2: Rev Reach RCA	77 deg
PHASE DISTANCE Z2: Comp Limit	90 deg
PHASE DISTANCE Z2: DIR RCA	49 deg
PHASE DISTANCE Z2: DIR Comp Limit	71 deg
PHASE DISTANCE Z2: Quad Right Blinder	68.18 ohms
PHASE DISTANCE Z2: Quad Right Blinder RCA	77 deg
PHASE DISTANCE Z2: Quad Left Blinder	68.18 ohms
PHASE DISTANCE Z2: Quad Left Blinder RCA	77 deg
PHASE DISTANCE Z2: Supervision	0.100 pu
PHASE DISTANCE Z2: Volt Level	0.000 pu
PHASE DISTANCE Z2: Delay	65.000 s
PHASE DISTANCE Z2: Block	Blq.21Z2-Z5 On (VO3)
PHASE DISTANCE Z2: Target	Self-reset
PHASE DISTANCE Z2: Events	Enabled
PHASE DISTANCE Z3: Function	Enabled
PHASE DISTANCE Z3: Direction	Forward
PHASE DISTANCE Z3: Shape	Quad
PHASE DISTANCE Z3: Xfmr Vol Connection	None
PHASE DISTANCE Z3: Xfmr Curr Connection	None
PHASE DISTANCE Z3: Reach	34.79 ohms
PHASE DISTANCE Z3: RCA	90 deg
PHASE DISTANCE Z3: Rev Reach	0.02 ohms
PHASE DISTANCE Z3: Rev Reach RCA	77 deg
PHASE DISTANCE Z3: Comp Limit	90 deg
PHASE DISTANCE Z3: DIR RCA	49 deg
PHASE DISTANCE Z3: DIR Comp Limit	71 deg
PHASE DISTANCE Z3: Quad Right Blinder	34.79 ohms
PHASE DISTANCE Z3: Quad Right Blinder RCA	77 deg
PHASE DISTANCE Z3: Quad Left Blinder	34.79 ohms
PHASE DISTANCE Z3: Quad Left Blinder RCA	77 deg
PHASE DISTANCE Z3: Supervision	0.100 pu
PHASE DISTANCE Z3: Volt Level	0.000 pu
PHASE DISTANCE Z3: Delay	0.600 s
PHASE DISTANCE Z3: Block	Blq.21Z2-Z5 On (VO3)
PHASE DISTANCE Z3: Target	Self-reset
PHASE DISTANCE Z3: Events	Enabled
PHASE DISTANCE Z4: Function	Enabled
PHASE DISTANCE Z4: Direction	Reverse
PHASE DISTANCE Z4: Shape	Quad

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TEXT COLOR

PHASE DISTANCE [GROUP 1] (continued from last page)

PHASE DISTANCE Z4: Xfmr Vol Connection	None
PHASE DISTANCE Z4: Xfmr Curr Connection	None
PHASE DISTANCE Z4: Reach	67.75 ohms
PHASE DISTANCE Z4: RCA	90 deg
PHASE DISTANCE Z4: Rev Reach	0.02 ohms
PHASE DISTANCE Z4: Rev Reach RCA	77 deg
PHASE DISTANCE Z4: Comp Limit	90 deg
PHASE DISTANCE Z4: DIR RCA	49 deg
PHASE DISTANCE Z4: DIR Comp Limit	71 deg
PHASE DISTANCE Z4: Quad Right Blinder	67.75 ohms
PHASE DISTANCE Z4: Quad Right Blinder RCA	77 deg
PHASE DISTANCE Z4: Quad Left Blinder	67.75 ohms
PHASE DISTANCE Z4: Quad Left Blinder RCA	77 deg
PHASE DISTANCE Z4: Supervision	0.100 pu
PHASE DISTANCE Z4: Volt Level	0.000 pu
PHASE DISTANCE Z4: Delay	2.500 s
PHASE DISTANCE Z4: Block	Blq.21Z2-Z5 On (VO3)
PHASE DISTANCE Z4: Target	Self-reset
PHASE DISTANCE Z4: Events	Enabled
PHASE DISTANCE Z5: Function	Enabled
PHASE DISTANCE Z5: Direction	Forward
PHASE DISTANCE Z5: Shape	Quad
PHASE DISTANCE Z5: Xfmr Vol Connection	None
PHASE DISTANCE Z5: Xfmr Curr Connection	None
PHASE DISTANCE Z5: Reach	66.95 ohms
PHASE DISTANCE Z5: RCA	90 deg
PHASE DISTANCE Z5: Rev Reach	0.02 ohms
PHASE DISTANCE Z5: Rev Reach RCA	77 deg
PHASE DISTANCE Z5: Comp Limit	90 deg
PHASE DISTANCE Z5: DIR RCA	49 deg
PHASE DISTANCE Z5: DIR Comp Limit	71 deg
PHASE DISTANCE Z5: Quad Right Blinder	66.95 ohms
PHASE DISTANCE Z5: Quad Right Blinder RCA	77 deg
PHASE DISTANCE Z5: Quad Left Blinder	66.95 ohms
PHASE DISTANCE Z5: Quad Left Blinder RCA	77 deg
PHASE DISTANCE Z5: Supervision	0.100 pu
PHASE DISTANCE Z5: Volt Level	0.000 pu
PHASE DISTANCE Z5: Delay	1.500 s
PHASE DISTANCE Z5: Block	Blq.21Z2-Z5 On (VO3)
PHASE DISTANCE Z5: Target	Self-reset
PHASE DISTANCE Z5: Events	Enabled

GROUND DISTANCE [GROUP 1]

GROUND DISTANCE Z1: Function	Enabled
GROUND DISTANCE Z1: Direction	Forward
GROUND DISTANCE Z1: Shape	Quad
GROUND DISTANCE Z1: Z0/Z1 Mag	3.41
GROUND DISTANCE Z1: Z0/Z1 Ang	3 deg
GROUND DISTANCE Z1: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z1: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z1: Reach	19.49 ohms
GROUND DISTANCE Z1: RCA	90 deg
GROUND DISTANCE Z1: Rev Reach	0.02 ohms
GROUND DISTANCE Z1: Rev Reach RCA	77 deg
GROUND DISTANCE Z1: POL Current	Neg-seq
GROUND DISTANCE Z1: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z1: Comp Limit	90 deg
GROUND DISTANCE Z1: DIR RCA	49 deg
GROUND DISTANCE Z1: DIR Comp Limit	71 deg
GROUND DISTANCE Z1: Quad Right Blinder	19.49 ohms
GROUND DISTANCE Z1: Quad Right Blinder RCA	77 deg
GROUND DISTANCE Z1: Quad Left Blinder	19.49 ohms
GROUND DISTANCE Z1: Quad Left Blinder RCA	77 deg
GROUND DISTANCE Z1: Supervision	0.100 pu
GROUND DISTANCE Z1: Volt Level	0.000 pu

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DESCRIPTION: (NONE)
TEXT COLOR

GROUND DISTANCE [GROUP 1] (continued from last page)

GROUND DISTANCE Z1: Delay	0.000 s
GROUND DISTANCE Z1: Block	Blq.21Z1 21N On (VO2)
GROUND DISTANCE Z1: Target	Self-reset
GROUND DISTANCE Z1: Events	Enabled
GROUND DISTANCE Z2: Function	Enabled
GROUND DISTANCE Z2: Direction	Forward
GROUND DISTANCE Z2: Shape	Quad
GROUND DISTANCE Z2: Z0/Z1 Mag	3.41
GROUND DISTANCE Z2: Z0/Z1 Ang	3 deg
GROUND DISTANCE Z2: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z2: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z2: Reach	68.18 ohms
GROUND DISTANCE Z2: RCA	90 deg
GROUND DISTANCE Z2: Rev Reach	0.02 ohms
GROUND DISTANCE Z2: Rev Reach RCA	77 deg
GROUND DISTANCE Z2: POL Current	Neg-seq
GROUND DISTANCE Z2: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z2: Comp Limit	90 deg
GROUND DISTANCE Z2: DIR RCA	49 deg
GROUND DISTANCE Z2: DIR Comp Limit	71 deg
GROUND DISTANCE Z2: Quad Right Blinder	68.18 ohms
GROUND DISTANCE Z2: Quad Right Blinder RCA	77 deg
GROUND DISTANCE Z2: Quad Left Blinder	68.18 ohms
GROUND DISTANCE Z2: Quad Left Blinder RCA	77 deg
GROUND DISTANCE Z2: Supervision	0.100 pu
GROUND DISTANCE Z2: Volt Level	0.000 pu
GROUND DISTANCE Z2: Delay	65.000 s
GROUND DISTANCE Z2: Block	Blq.21Z1 21N On (VO2)
GROUND DISTANCE Z2: Target	Self-reset
GROUND DISTANCE Z2: Events	Enabled
GROUND DISTANCE Z3: Function	Enabled
GROUND DISTANCE Z3: Direction	Forward
GROUND DISTANCE Z3: Shape	Quad
GROUND DISTANCE Z3: Z0/Z1 Mag	3.41
GROUND DISTANCE Z3: Z0/Z1 Ang	3 deg
GROUND DISTANCE Z3: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z3: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z3: Reach	34.79 ohms
GROUND DISTANCE Z3: RCA	90 deg
GROUND DISTANCE Z3: Rev Reach	0.02 ohms
GROUND DISTANCE Z3: Rev Reach RCA	77 deg
GROUND DISTANCE Z3: POL Current	Neg-seq
GROUND DISTANCE Z3: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z3: Comp Limit	90 deg
GROUND DISTANCE Z3: DIR RCA	49 deg
GROUND DISTANCE Z3: DIR Comp Limit	71 deg
GROUND DISTANCE Z3: Quad Right Blinder	34.79 ohms
GROUND DISTANCE Z3: Quad Right Blinder RCA	77 deg
GROUND DISTANCE Z3: Quad Left Blinder	34.79 ohms
GROUND DISTANCE Z3: Quad Left Blinder RCA	77 deg
GROUND DISTANCE Z3: Supervision	0.100 pu
GROUND DISTANCE Z3: Volt Level	0.000 pu
GROUND DISTANCE Z3: Delay	0.600 s
GROUND DISTANCE Z3: Block	Blq.21Z1 21N On (VO2)
GROUND DISTANCE Z3: Target	Self-reset
GROUND DISTANCE Z3: Events	Enabled
GROUND DISTANCE Z4: Function	Enabled
GROUND DISTANCE Z4: Direction	Reverse
GROUND DISTANCE Z4: Shape	Quad
GROUND DISTANCE Z4: Z0/Z1 Mag	3.41
GROUND DISTANCE Z4: Z0/Z1 Ang	3 deg
GROUND DISTANCE Z4: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z4: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z4: Reach	67.75 ohms
GROUND DISTANCE Z4: RCA	90 deg

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TEXT COLOR

GROUND DISTANCE [GROUP 1] (continued from last page)

GROUND DISTANCE Z4: Rev Reach	0.02 ohms
GROUND DISTANCE Z4: Rev Reach RCA	77 deg
GROUND DISTANCE Z4: POL Current	Neg-seq
GROUND DISTANCE Z4: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z4: Comp Limit	90 deg
GROUND DISTANCE Z4: DIR RCA	49 deg
GROUND DISTANCE Z4: DIR Comp Limit	71 deg
GROUND DISTANCE Z4: Quad Right Blinder	67.75 ohms
GROUND DISTANCE Z4: Quad Right Blinder RCA	77 deg
GROUND DISTANCE Z4: Quad Left Blinder	67.75 ohms
GROUND DISTANCE Z4: Quad Left Blinder RCA	77 deg
GROUND DISTANCE Z4: Supervision	0.100 pu
GROUND DISTANCE Z4: Volt Level	0.000 pu
GROUND DISTANCE Z4: Delay	2.500 s
GROUND DISTANCE Z4: Block	Blq.21Z1 21N On (VO2)
GROUND DISTANCE Z4: Target	Self-reset
GROUND DISTANCE Z4: Events	Enabled
GROUND DISTANCE Z5: Function	Enabled
GROUND DISTANCE Z5: Direction	Forward
GROUND DISTANCE Z5: Shape	Quad
GROUND DISTANCE Z5: Z0/Z1 Mag	3.41
GROUND DISTANCE Z5: Z0/Z1 Ang	3 deg
GROUND DISTANCE Z5: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z5: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z5: Reach	66.95 ohms
GROUND DISTANCE Z5: RCA	90 deg
GROUND DISTANCE Z5: Rev Reach	0.02 ohms
GROUND DISTANCE Z5: Rev Reach RCA	77 deg
GROUND DISTANCE Z5: POL Current	Neg-seq
GROUND DISTANCE Z5: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z5: Comp Limit	90 deg
GROUND DISTANCE Z5: DIR RCA	49 deg
GROUND DISTANCE Z5: DIR Comp Limit	71 deg
GROUND DISTANCE Z5: Quad Right Blinder	66.95 ohms
GROUND DISTANCE Z5: Quad Right Blinder RCA	77 deg
GROUND DISTANCE Z5: Quad Left Blinder	66.95 ohms
GROUND DISTANCE Z5: Quad Left Blinder RCA	77 deg
GROUND DISTANCE Z5: Supervision	0.100 pu
GROUND DISTANCE Z5: Volt Level	0.000 pu
GROUND DISTANCE Z5: Delay	1.500 s
GROUND DISTANCE Z5: Block	Blq.21Z1 21N On (VO2)
GROUND DISTANCE Z5: Target	Self-reset
GROUND DISTANCE Z5: Events	Enabled

POWER SWING DETECT [GROUP 1]

Function	Enabled
Source	SRC 1 (SRC 1)
Shape	Quad Shape
Mode	Two Step
Supv	0.200 pu
Fwd Reach	157.25 ohms
Quad Fwd Mid	161.17 ohms
Quad Fwd Out	162.92 ohms
Fwd Rca	77 deg
Rev Reach	122.40 ohms
Quad Rev Mid	126.32 ohms
Quad Rev Out	128.06 ohms
Rev Rca	77 deg
Outer Limit Angle	120 deg
Middle Limit Angle	80 deg
Inner Limit Angle	74 deg
Outer Rgt Bld	128.06 ohms
Outer Lft Bld	110.64 ohms
Midle Rgt Bld	160.65 ohms
Midle Lft Bld	69.44 ohms

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POWER SWING DETECT [GROUP 1] (continued from last page)

Inner Rgt Bld	122.40 ohms
Inner Lft Bld	104.72 ohms
Delay 1 Pickup	0.002 s
Delay 1 Reset	0.050 s
Delay 2 Pickup	0.017 s
Delay 3 Pickup	0.009 s
Delay 4 Pickup	0.017 s
Seal-In Delay	0.400 s
Trip Mode	Delayed
Block	NEUTRAL TOC1 PKP
Target	Self-reset
Event	Enabled

PHASE CURRENT

PHASE TOC [GROUP 1]

PHASE TOC1: Function	Enabled
PHASE TOC1: Signal Source	SRC 1 (SRC 1)
PHASE TOC1: Input	Phasor
PHASE TOC1: Pickup	0.720 pu
PHASE TOC1: Curve	IEC Curve A
PHASE TOC1: TD Multiplier	0.10
PHASE TOC1: Reset	Instantaneous
PHASE TOC1: Voltage Restraint	Disabled
PHASE TOC1: Block A	VT ok On (VO8)
PHASE TOC1: Block B	VT ok On (VO8)
PHASE TOC1: Block C	VT ok On (VO8)
PHASE TOC1: Target	Self-reset
PHASE TOC1: Events	Enabled

NEUTRAL CURRENT

NEUTRAL TOC [GROUP 1]

NEUTRAL TOC1: Function	Enabled
NEUTRAL TOC1: Source	SRC 1 (SRC 1)
NEUTRAL TOC1: Input	Phasor
NEUTRAL TOC1: Pickup	0.050 pu
NEUTRAL TOC1: Curve	IEC Curve A
NEUTRAL TOC1: TD Multiplier	0.30
NEUTRAL TOC1: Reset	Instantaneous
NEUTRAL TOC1: Block	VT ok On (VO8)
NEUTRAL TOC1: Target	Self-reset
NEUTRAL TOC1: Events	Enabled
NEUTRAL TOC2: Function	Enabled
NEUTRAL TOC2: Source	SRC 1 (SRC 1)
NEUTRAL TOC2: Input	Phasor
NEUTRAL TOC2: Pickup	0.050 pu
NEUTRAL TOC2: Curve	IEC Curve A
NEUTRAL TOC2: TD Multiplier	0.30
NEUTRAL TOC2: Reset	Instantaneous
NEUTRAL TOC2: Block	NEG SEQ DIR OC1 REV
NEUTRAL TOC2: Target	Self-reset
NEUTRAL TOC2: Events	Enabled

NEGATIVE SEQUENCE CURRENT

NEGATIVE SEQUENCE DIRECTIONAL OC [GROUP 1]

NEGATIVE SEQ DIR OC1: Function	Enabled
NEGATIVE SEQ DIR OC1: Source	SRC 1 (SRC 1)
NEGATIVE SEQ DIR OC1: Offset	0.00 ohms
NEGATIVE SEQ DIR OC1: Type	Neg Sequence
NEGATIVE SEQ DIR OC1: POS SEQ Restraint	0.000
NEGATIVE SEQ DIR OC1: Forward ECA	78 ° Lag
NEGATIVE SEQ DIR OC1: Forward Limit Angle	80 deg
NEGATIVE SEQ DIR OC1: Forward Pickup	0.050 pu
NEGATIVE SEQ DIR OC1: Reverse Limit Angle	80 deg
NEGATIVE SEQ DIR OC1: Reverse Pickup	0.015 pu
NEGATIVE SEQ DIR OC1: Block	Blq.21Z1 21N On (VO2)

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NEGATIVE SEQUENCE DIRECTIONAL OC [GROUP 1] (continued from last page)

NEGATIVE SEQ DIR OC1: Target	Self-reset
NEGATIVE SEQ DIR OC1: Events	Enabled

BREAKER FAILURE [GROUP 1]

BF1: Function	Enabled
BF1: Mode	3-Pole
BF1: Source	SRC 1 (SRC 1)
BF1: Current Supervision	Yes
BF1: Use Seal-In	No
BF1: Three Pole Initiate	Start 50BF On (VO4)
BF1: Block	OFF
BF1: Phase Current Supv Pickup	0.150 pu
BF1: Neutral Current Supv Pickup	0.150 pu
BF1: Use Timer 1	Yes
BF1: Timer 1 Pickup Delay	0.200 s
BF1: Use Timer 2	No
BF1: Timer 2 Pickup Delay	0.000 s
BF1: Use Timer 3	No
BF1: Timer 3 Pickup Delay	0.000 s
BF1: Breaker Pos1 Phase A/3P	Polo 1 cerr On(H7c)
BF1: Breaker Pos2 Phase A/3P	OFF
BF1: Breaker Test On	ON
BF1: Phase Current HiSet Pickup	0.150 pu
BF1: Neutral Current HiSet Pickup	0.150 pu
BF1: Phase Current LoSet Pickup	0.150 pu
BF1: Neutral Current LoSet Pickup	0.150 pu
BF1: LoSet Time Delay	0.000 s
BF1: Trip Dropout Delay	0.000 s
BF1: Target	Self-reset
BF1: Events	Enabled
BF1: Phase A Initiate	Trip polo 1 On(W5c)
BF1: Phase B Initiate	Trip polo 2 On(W6a)
BF1: Phase C Initiate	Trip polo 3 On(W6c)
BF1: Breaker Pos1 Phase B	Polo 2 cerr On(H8a)
BF1: Breaker Pos1 Phase C	Polo 3 cerr On(H8c)
BF1: Breaker Pos2 Phase B	OFF
BF1: Breaker Pos2 Phase C	OFF

CONTROL ELEMENTS

TRIP OUTPUT

Trip Mode	3 Pole & 1 Pole
Trip 3-Pole Input1	Trip 3p On (VO1)
Trip 3-Pole Input2	OFF
Trip 3-Pole Input3	OFF
Trip 3-Pole Input4	OFF
Trip 3-Pole Input5	OFF
Trip 3-Pole Input6	OFF
Trip 1-Pole Input1	GND DIST Z1 OP
Trip 1-Pole Input2	OFF
Trip 1-Pole Input3	OFF
Trip 1-Pole Input4	OFF
Trip 1-Pole Input5	OFF
Trip 1-Pole Input6	OFF
Trip Reclose Input1	GND DIST Z1 OP
Trip Reclose Input2	AR 3P START On (VO17)
Trip Reclose Input3	OFF
Trip Reclose Input4	OFF
Trip Reclose Input5	OFF
Trip Reclose Input6	OFF
Trip Seal in Delay	0.000 s
Trip Reset	Pole Curr OR Custom
Start Timer Z2Ph In1	OFF
Start Timer Z2Ph In2	OFF
Start Timer Z2Gr In1	OFF
Start Timer Z2Gr In2	OFF

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TRIP OUTPUT (continued from last page)

BKR Phase A Open	OFF
BKR Phase B Open	OFF
BKR Phase C Open	OFF
Trip Force 3-Pole	OFF
Trip Pilot Priority	0.000 s
Reverse Fault	OFF
Trip Delay On Evolving Faults	0.000 s
Trip Events	Disabled

SYNCHROCHECK

SYNCHROCHECK1: Function	Enabled
SYNCHROCHECK1: Block	OFF
SYNCHROCHECK1: V1 Source	SRC 1 (SRC 1)
SYNCHROCHECK1: V2 Source	SRC 2 (SRC 2)
SYNCHROCHECK1: Max Volt Diff	40173 V
SYNCHROCHECK1: Max Angle Diff	30 deg
SYNCHROCHECK1: Max Freq Diff	0.10 Hz
SYNCHROCHECK1: Freq Hysteresis	0.06 Hz
SYNCHROCHECK1: Dead Source Select	None
SYNCHROCHECK1: Dead V1 Max Volt	0.20 pu
SYNCHROCHECK1: Dead V2 Max Volt	0.20 pu
SYNCHROCHECK1: Live V1 Min Volt	0.70 pu
SYNCHROCHECK1: Live V2 Min Volt	0.70 pu
SYNCHROCHECK1: Target	Self-reset
SYNCHROCHECK1: Events	Enabled

MONITORING ELEMENTS

VT FUSE FAILURE

VT FUSE FAILURE 1: Function	Enabled

OPEN POLE

Function	Enabled
Block	OFF
Voltage SUPV	Disabled
Current Pickup	0.030 pu
Open Pole Line XC1	9999.9 ohms
Open Pole Line XC0	9999.9 ohms
Open Pole REM Current PKP	0.050 pu
Open Pole Mode	Accelerated
Open Pole Detection	I AND V AND CBaux
Target	Latched
Events	Enabled

PILOT SCHEMES

1P HYBRID POTT SCHEME

Function	Enabled
Block	OFF
Permissive Echo	Custom
Echo Condition	ECHO TX On (VO67)
Weak Infeed	Disabled
W/I Condition	OFF
Rx Pickup Delay	0.001 s
Trans Block Pickup Delay	0.030 s
Trans Block Reset Delay	0.170 s
Echo Duration	0.100 s
Echo Lockout	0.250 s
Seal-In Delay	0.100 s
Gnd Dir OC Fwd	OFF
Gnd Dir OC Rev	OFF
No of Comm Bits	1
Rx1	RX. 85A On (VO21)
Rx2	OFF
Rx3	OFF
Rx4	OFF
Target	Self-reset

URS A9 DESPUÉS DE CAMBIO DE AJUSTES 26.03.2015.URS
C:\USERS\MMISSENE\DESKTOP\MMM\ACTUALIZACIÓN CRAPS\TINGU\A9
DEVICE DEFINITION
FILES
ORDER CODE: D60-K03-HCH-F8L-H6U-M6U-P6U-U6U-W6T
VERSION: 5.7X
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DESCRIPTION: (NONE)
TEXT COLOR

1P HYBRID POTT SCHEME (continued from last page)

Event	Enabled

AUTORECLOSE 1P

Function	Enabled
Mode	3 Pole - B
Max Number Of Shots	1
AR Initiate Mode	Protection only
Block BKR1	Bloq. 79 On (VO6)
Close Time BKR1	0.10 s
BKR Man Close	OFF
Blk Time Upon Man Cls	8.00 s
1-P Init	OFF
3-P Init	AR 3P START On (VO17)
3-P TD Init	OFF
Multi P Fault	OFF
BKR 1 Pole Open	OFF
BKR 3 Pole Open	52A9 Abierto On(M7a)
3-P Dead Time 1	0.50 s
3-P Dead Time 2	1.20 s
3-P Dead Time 3	2.00 s
3-P Dead Time 4	4.00 s
Extend Dead T1	OFF
Dead T1 Extension	0.00 s
Reset	BREAKER 1 CLOSED
Reset Time	8.00 s
BKR Closed	OFF
Block	Bloq. 79 On (VO6)
Pause	OFF
Inc Seq Time	5.00 s
Block BKR2	OFF
Close Time BKR2	0.10 s
Transfer 1 to 2	No
Transfer 2 to 1	No
BKR1 Fail Option	Continue
BKR2 Fail Option	Continue
1-P Dead Time	1.00 s
BKR Sequence	1
Transfer Time	4.00 s
BUS FLT Init	OFF
Event	Enabled

INPUTS/OUTPUTS

CONTACT INPUTS

[H7A] Contact Input 1 ID	52 apto
[H7A] Contact Input 1 Debounce Time	2.0 ms
[H7A] Contact Input 1 Events	Disabled
[H7C] Contact Input 2 ID	Polo 1 cerr
[H7C] Contact Input 2 Debounce Time	2.0 ms
[H7C] Contact Input 2 Events	Disabled
[H8A] Contact Input 3 ID	Polo 2 cerr
[H8A] Contact Input 3 Debounce Time	2.0 ms
[H8A] Contact Input 3 Events	Disabled
[H8C] Contact Input 4 ID	Polo 3 cerr
[H8C] Contact Input 4 Debounce Time	2.0 ms
[H8C] Contact Input 4 Events	Disabled
[M7A] Contact Input 5 ID	52A9 Abierto
[M7A] Contact Input 5 Debounce Time	2.0 ms
[M7A] Contact Input 5 Events	Disabled
[M7C] Contact Input 6 ID	Cont Ip 6
[M7C] Contact Input 6 Debounce Time	2.0 ms
[M7C] Contact Input 6 Events	Disabled
[M8A] Contact Input 7 ID	P.Cort. Abie
[M8A] Contact Input 7 Debounce Time	2.0 ms
[M8A] Contact Input 7 Events	Disabled
[M8C] Contact Input 8 ID	P.Cort. Cerr

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DESCRIPTION: (NONE)
TEXT COLOR

CONTACT INPUTS (continued from last page)

[M8C] Contact Input 8 Debounce Time	2.0 ms
[M8C] Contact Input 8 Events	Disabled
[P7A] Contact Input 9 ID	Rec. en prog
[P7A] Contact Input 9 Debounce Time	2.0 ms
[P7A] Contact Input 9 Events	Disabled
[P7C] Contact Input 10 ID	Bloq. 79 p43
[P7C] Contact Input 10 Debounce Time	2.0 ms
[P7C] Contact Input 10 Events	Disabled
[P8A] Contact Input 11 ID	Aviso Cierre
[P8A] Contact Input 11 Debounce Time	2.0 ms
[P8A] Contact Input 11 Events	Disabled
[P8C] Contact Input 12 ID	Op. 86B
[P8C] Contact Input 12 Debounce Time	2.0 ms
[P8C] Contact Input 12 Events	Disabled
[U7A] Contact Input 13 ID	Falla TP Lin
[U7A] Contact Input 13 Debounce Time	2.0 ms
[U7A] Contact Input 13 Events	Disabled
[U7C] Contact Input 14 ID	Falla TP Bar
[U7C] Contact Input 14 Debounce Time	2.0 ms
[U7C] Contact Input 14 Events	Disabled
[U8A] Contact Input 15 ID	Rx. 85A1
[U8A] Contact Input 15 Debounce Time	2.0 ms
[U8A] Contact Input 15 Events	Disabled
[U8C] Contact Input 16 ID	Rx. 85D
[U8C] Contact Input 16 Debounce Time	2.0 ms
[U8C] Contact Input 16 Events	Disabled
[W5A] Contact Input 17 ID	Hab. Reconex
[W5A] Contact Input 17 Debounce Time	2.0 ms
[W5A] Contact Input 17 Events	Disabled
[W5C] Contact Input 18 ID	Trip polo 1
[W5C] Contact Input 18 Debounce Time	2.0 ms
[W5C] Contact Input 18 Events	Disabled
[W6A] Contact Input 19 ID	Trip polo 2
[W6A] Contact Input 19 Debounce Time	2.0 ms
[W6A] Contact Input 19 Events	Disabled
[W6C] Contact Input 20 ID	Trip polo 3
[W6C] Contact Input 20 Debounce Time	2.0 ms
[W6C] Contact Input 20 Events	Disabled
[W7A] Contact Input 21 ID	Start BF 87B
[W7A] Contact Input 21 Debounce Time	2.0 ms
[W7A] Contact Input 21 Events	Disabled
[W7C] Contact Input 22 ID	Rx. 85A2
[W7C] Contact Input 22 Debounce Time	2.0 ms
[W7C] Contact Input 22 Events	Disabled
[W8A] Contact Input 23 ID	Rx. 85C 1
[W8A] Contact Input 23 Debounce Time	2.0 ms
[W8A] Contact Input 23 Events	Disabled
[W8C] Contact Input 24 ID	Rx.85C 2
[W8C] Contact Input 24 Debounce Time	2.0 ms
[W8C] Contact Input 24 Events	Disabled

CONTACT INPUT THRESHOLDS

52 apto, Polo 1 cerr, Polo 2 cerr, Polo 3 cerr(H7a, H7c, H8a, H8c)	33 Vdc
52A9 Abierto, Cont Ip 6, P.Cort. Abie, P.Cort. Cerr(M7a, M7c, M8a, M8c)	33 Vdc
Rec. en prog, Bloq. 79 p43, Aviso Cierre, Op. 86B(P7a, P7c, P8a, P8c)	33 Vdc
Falla TP Lin, Falla TP Bar, Rx. 85A1, Rx. 85D(U7a, U7c, U8a, U8c)	33 Vdc
Hab. Reconex, Trip polo 1, Trip polo 2, Trip polo 3(W5a, W5c, W6a, W6c)	33 Vdc
Start BF 87B, Rx. 85A2, Rx. 85C 1, Rx.85C 2(W7a, W7c, W8a, W8c)	33 Vdc

CONTACT OUTPUTS

[H1] Contact Output 1 ID	50BF
[H1] Contact Output 1 Operate	BKR FAIL 1 T1 OP
[H1] Contact Output 1 Seal-In	OFF
[H1] Contact Output 1 Events	Enabled
[H2] Contact Output 2 ID	79 52AR

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TEXT COLOR

CONTACT OUTPUTS (continued from last page)

[H2] Contact Output 2 Operate	AR CLOSE BKR 1
[H2] Contact Output 2 Seal-In	OFF
[H2] Contact Output 2 Events	Enabled
[H3] Contact Output 3 ID	PKP Z3 EDAG
[H3] Contact Output 3 Operate	PKP Z3 On (VO66)
[H3] Contact Output 3 Seal-In	ON
[H3] Contact Output 3 Events	Enabled
[H6] Contact Output 6 ID	TRIP SCADA
[H6] Contact Output 6 Operate	TRIP OUTPUT OP
[H6] Contact Output 6 Seal-In	OFF
[H6] Contact Output 6 Events	Enabled
[M3] Contact Output 9 ID	TX 85A1
[M3] Contact Output 9 Operate	Emision 85A On (VO24)
[M3] Contact Output 9 Seal-In	OFF
[M3] Contact Output 9 Events	Enabled
[M4] Contact Output 10 ID	TX 85D
[M4] Contact Output 10 Operate	Tx. 85D On (VO22)
[M4] Contact Output 10 Seal-In	OFF
[M4] Contact Output 10 Events	Enabled
[M5] Contact Output 11 ID	TRIP 86B
[M5] Contact Output 11 Operate	BKR FAIL 1 T1 OP
[M5] Contact Output 11 Seal-In	OFF
[M5] Contact Output 11 Events	Enabled
[M6] Contact Output 12 ID	Rec. en prog
[M6] Contact Output 12 Operate	AR RIP
[M6] Contact Output 12 Seal-In	OFF
[M6] Contact Output 12 Events	Enabled
[P1] Contact Output 13 ID	Prueba HPOTT
[P1] Contact Output 13 Operate	HYBRID POTT OP
[P1] Contact Output 13 Seal-In	OFF
[P1] Contact Output 13 Events	Enabled
[P2] Contact Output 14 ID	TRIP POLO A
[P2] Contact Output 14 Operate	TRIP PHASE A
[P2] Contact Output 14 Seal-In	OFF
[P2] Contact Output 14 Events	Enabled
[P3] Contact Output 15 ID	TRIP POLO B
[P3] Contact Output 15 Operate	TRIP PHASE B
[P3] Contact Output 15 Seal-In	OFF
[P3] Contact Output 15 Events	Enabled
[P4] Contact Output 16 ID	TRIP POLO C
[P4] Contact Output 16 Operate	TRIP PHASE C
[P4] Contact Output 16 Seal-In	OFF
[P4] Contact Output 16 Events	Enabled
[P5] Contact Output 17 ID	TRIP POLO A
[P5] Contact Output 17 Operate	TRIP PHASE A
[P5] Contact Output 17 Seal-In	OFF
[P5] Contact Output 17 Events	Enabled
[P6] Contact Output 18 ID	TRIP POLO B
[P6] Contact Output 18 Operate	TRIP PHASE B
[P6] Contact Output 18 Seal-In	OFF
[P6] Contact Output 18 Events	Enabled
[U1] Contact Output 19 ID	TRIP POLO C
[U1] Contact Output 19 Operate	TRIP PHASE C
[U1] Contact Output 19 Seal-In	OFF
[U1] Contact Output 19 Events	Enabled
[U2] Contact Output 20 ID	orden 79
[U2] Contact Output 20 Operate	AR CLOSE BKR 1
[U2] Contact Output 20 Seal-In	OFF
[U2] Contact Output 20 Events	Enabled
[U3] Contact Output 21 ID	RETRIP A
[U3] Contact Output 21 Operate	BKR FAIL 1 RETRIP
[U3] Contact Output 21 Seal-In	OFF
[U3] Contact Output 21 Events	Enabled
[U4] Contact Output 22 ID	RETRIP B
[U4] Contact Output 22 Operate	BKR FAIL 1 RETRIP

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DESCRIPTION: (NONE)
TEXT COLOR

CONTACT OUTPUTS (continued from last page)

[U4] Contact Output 22 Seal-In	OFF
[U4] Contact Output 22 Events	Enabled
[U5] Contact Output 23 ID	RETRIP C
[U5] Contact Output 23 Operate	BKR FAIL 1 RETRIP
[U5] Contact Output 23 Seal-In	OFF
[U5] Contact Output 23 Events	Enabled
[W1] Contact Output 25 ID	TX. 85A2
[W1] Contact Output 25 Operate	Emision 85A On (VO24)
[W1] Contact Output 25 Seal-In	OFF
[W1] Contact Output 25 Events	Enabled
[W2] Contact Output 26 ID	TX. 85D
[W2] Contact Output 26 Operate	Tx. 85D On (VO22)
[W2] Contact Output 26 Seal-In	OFF
[W2] Contact Output 26 Events	Enabled

VIRTUAL OUTPUTS

Virtual Output 1 ID	Trip 3p
Virtual Output 1 Events	Enabled
Virtual Output 2 ID	Blq.21Z1 21N
Virtual Output 2 Events	Enabled
Virtual Output 3 ID	Blq.21Z2-Z5
Virtual Output 3 Events	Disabled
Virtual Output 4 ID	Start 50BF
Virtual Output 4 Events	Enabled
Virtual Output 5 ID	Trip 85D
Virtual Output 5 Events	Enabled
Virtual Output 6 ID	Bloq. 79
Virtual Output 6 Events	Enabled
Virtual Output 7 ID	Open 3p
Virtual Output 7 Events	Enabled
Virtual Output 8 ID	VT ok
Virtual Output 8 Events	Enabled
Virtual Output 9 ID	LED Z1 Op.
Virtual Output 9 Events	Disabled
Virtual Output 10 ID	LED Z1B Op.
Virtual Output 10 Events	Disabled
Virtual Output 11 ID	LED Z2 Op.
Virtual Output 11 Events	Disabled
Virtual Output 12 ID	LED Z3 Op.
Virtual Output 12 Events	Disabled
Virtual Output 13 ID	LED Z4 Op.
Virtual Output 13 Events	Disabled
Virtual Output 14 ID	LED 51-51N
Virtual Output 14 Events	Disabled
Virtual Output 15 ID	LED ECHO
Virtual Output 15 Events	Disabled
Virtual Output 16 ID	LED 67N
Virtual Output 16 Events	Disabled
Virtual Output 17 ID	AR 3P START
Virtual Output 17 Events	Enabled
Virtual Output 21 ID	RX. 85A
Virtual Output 21 Events	Enabled
Virtual Output 22 ID	Tx. 85D
Virtual Output 22 Events	Disabled
Virtual Output 23 ID	BLOCK HYBRID
Virtual Output 23 Events	Disabled
Virtual Output 24 ID	Emision 85A
Virtual Output 24 Events	Enabled
Virtual Output 30 ID	DNP 79 BLOQ
Virtual Output 30 Events	Disabled
Virtual Output 31 ID	DNP 79 ON
Virtual Output 31 Events	Disabled
Virtual Output 32 ID	DNP TP LINEA
Virtual Output 32 Events	Disabled
Virtual Output 33 ID	DNP TP BARRA

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DESCRIPTION: (NONE)
TEXT COLOR

VIRTUAL OUTPUTS (continued from last page)

Virtual Output 33 Events	Disabled
Virtual Output 34 ID	DNP RX RAN
Virtual Output 34 Events	Disabled
Virtual Output 35 ID	DNP TX 85A
Virtual Output 35 Events	Disabled
Virtual Output 36 ID	DNP RX JAH
Virtual Output 36 Events	Disabled
Virtual Output 37 ID	DNP ECHO
Virtual Output 37 Events	Disabled
Virtual Output 38 ID	DNP 79 CLOSE
Virtual Output 38 Events	Disabled
Virtual Output 39 ID	DNP 21/21N
Virtual Output 39 Events	Disabled
Virtual Output 40 ID	DNP 67N
Virtual Output 40 Events	Disabled
Virtual Output 41 ID	DNP 50BF
Virtual Output 41 Events	Disabled
Virtual Output 42 ID	DNP Z1B
Virtual Output 42 Events	Disabled
Virtual Output 43 ID	DNP Z1
Virtual Output 43 Events	Disabled
Virtual Output 44 ID	DNP Z2
Virtual Output 44 Events	Disabled
Virtual Output 45 ID	DNP Z3
Virtual Output 45 Events	Disabled
Virtual Output 46 ID	DNP Z4
Virtual Output 46 Events	Disabled
Virtual Output 47 ID	DNP 51/51N
Virtual Output 47 Events	Disabled
Virtual Output 48 ID	DNP TRIP A
Virtual Output 48 Events	Disabled
Virtual Output 49 ID	DNP TRIP B
Virtual Output 49 Events	Disabled
Virtual Output 50 ID	DNP TRIP C
Virtual Output 50 Events	Disabled
Virtual Output 51 ID	DNP TRIP GND
Virtual Output 51 Events	Disabled
Virtual Output 52 ID	DNP TRIP S1
Virtual Output 52 Events	Disabled
Virtual Output 53 ID	DNP PICKUP
Virtual Output 53 Events	Disabled
Virtual Output 54 ID	DNP MOD EMER
Virtual Output 54 Events	Disabled
Virtual Output 55 ID	DNP SOTF
Virtual Output 55 Events	Disabled
Virtual Output 56 ID	DNP VT FAIL
Virtual Output 56 Events	Disabled
Virtual Output 57 ID	DNP PSWING
Virtual Output 57 Events	Disabled
Virtual Output 58 ID	DNP 79BLQ EX
Virtual Output 58 Events	Disabled
Virtual Output 59 ID	DNP RX85D
Virtual Output 59 Events	Disabled
Virtual Output 60 ID	DNP TX85D
Virtual Output 60 Events	Disabled
Virtual Output 61 ID	DNP INC PCOR
Virtual Output 61 Events	Disabled
Virtual Output 64 ID	Osc Trigger
Virtual Output 64 Events	Enabled
Virtual Output 65 ID	EDAG Z5
Virtual Output 65 Events	Enabled
Virtual Output 66 ID	PKP Z3
Virtual Output 66 Events	Enabled
Virtual Output 67 ID	ECHO TX
Virtual Output 67 Events	Enabled

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TEXT COLOR

REMOTE DEVICES

Remote Device 1 ID	Remote Device 1
Remote Device 1 ETYPE APPID	0
Remote Device 1 DATASET	Fixed
Remote Device 2 ID	Remote Device 2
Remote Device 2 ETYPE APPID	0
Remote Device 2 DATASET	Fixed
Remote Device 3 ID	Remote Device 3
Remote Device 3 ETYPE APPID	0
Remote Device 3 DATASET	Fixed
Remote Device 4 ID	Remote Device 4
Remote Device 4 ETYPE APPID	0
Remote Device 4 DATASET	Fixed
Remote Device 5 ID	Remote Device 5
Remote Device 5 ETYPE APPID	0
Remote Device 5 DATASET	Fixed
Remote Device 6 ID	Remote Device 6
Remote Device 6 ETYPE APPID	0
Remote Device 6 DATASET	Fixed
Remote Device 7 ID	Remote Device 7
Remote Device 7 ETYPE APPID	0
Remote Device 7 DATASET	Fixed
Remote Device 8 ID	Remote Device 8
Remote Device 8 ETYPE APPID	0
Remote Device 8 DATASET	Fixed
Remote Device 9 ID	Remote Device 9
Remote Device 9 ETYPE APPID	0
Remote Device 9 DATASET	Fixed
Remote Device 10 ID	Remote Device 10
Remote Device 10 ETYPE APPID	0
Remote Device 10 DATASET	Fixed
Remote Device 11 ID	Remote Device 11
Remote Device 11 ETYPE APPID	0
Remote Device 11 DATASET	Fixed
Remote Device 12 ID	Remote Device 12
Remote Device 12 ETYPE APPID	0
Remote Device 12 DATASET	Fixed
Remote Device 13 ID	Remote Device 13
Remote Device 13 ETYPE APPID	0
Remote Device 13 DATASET	Fixed
Remote Device 14 ID	Remote Device 14
Remote Device 14 ETYPE APPID	0
Remote Device 14 DATASET	Fixed
Remote Device 15 ID	Remote Device 15
Remote Device 15 ETYPE APPID	0
Remote Device 15 DATASET	Fixed
Remote Device 16 ID	Remote Device 16
Remote Device 16 ETYPE APPID	0
Remote Device 16 DATASET	Fixed

IEC 61850 GOOSE ANALOGS INPUTS

IEC61850 GOOSE Analog Input 1 Default Value	1000.000
IEC61850 GOOSE Analog Input 1 Mode	Default Value
IEC61850 GOOSE Analog Input 1 Units	
IEC61850 GOOSE Analog Input 1 PU Base	1.000
IEC61850 GOOSE Analog Input 2 Default Value	1000.000
IEC61850 GOOSE Analog Input 2 Mode	Default Value
IEC61850 GOOSE Analog Input 2 Units	
IEC61850 GOOSE Analog Input 2 PU Base	1.000
IEC61850 GOOSE Analog Input 3 Default Value	1000.000
IEC61850 GOOSE Analog Input 3 Mode	Default Value
IEC61850 GOOSE Analog Input 3 Units	
IEC61850 GOOSE Analog Input 3 PU Base	1.000
IEC61850 GOOSE Analog Input 4 Default Value	1000.000
IEC61850 GOOSE Analog Input 4 Mode	Default Value

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DESCRIPTION: (NONE)
TEXT COLOR

IEC 61850 GOOSE ANALOGS INPUTS (continued from last page)

IEC61850 GOOSE Analog Input 4 Units	
IEC61850 GOOSE Analog Input 4 PU Base	1.000
IEC61850 GOOSE Analog Input 5 Default Value	1000.000
IEC61850 GOOSE Analog Input 5 Mode	Default Value
IEC61850 GOOSE Analog Input 5 Units	
IEC61850 GOOSE Analog Input 5 PU Base	1.000
IEC61850 GOOSE Analog Input 6 Default Value	1000.000
IEC61850 GOOSE Analog Input 6 Mode	Default Value
IEC61850 GOOSE Analog Input 6 Units	
IEC61850 GOOSE Analog Input 6 PU Base	1.000
IEC61850 GOOSE Analog Input 7 Default Value	1000.000
IEC61850 GOOSE Analog Input 7 Mode	Default Value
IEC61850 GOOSE Analog Input 7 Units	
IEC61850 GOOSE Analog Input 7 PU Base	1.000
IEC61850 GOOSE Analog Input 8 Default Value	1000.000
IEC61850 GOOSE Analog Input 8 Mode	Default Value
IEC61850 GOOSE Analog Input 8 Units	
IEC61850 GOOSE Analog Input 8 PU Base	1.000
IEC61850 GOOSE Analog Input 9 Default Value	1000.000
IEC61850 GOOSE Analog Input 9 Mode	Default Value
IEC61850 GOOSE Analog Input 9 Units	
IEC61850 GOOSE Analog Input 9 PU Base	1.000
IEC61850 GOOSE Analog Input 10 Default Value	1000.000
IEC61850 GOOSE Analog Input 10 Mode	Default Value
IEC61850 GOOSE Analog Input 10 Units	
IEC61850 GOOSE Analog Input 10 PU Base	1.000
IEC61850 GOOSE Analog Input 11 Default Value	1000.000
IEC61850 GOOSE Analog Input 11 Mode	Default Value
IEC61850 GOOSE Analog Input 11 Units	
IEC61850 GOOSE Analog Input 11 PU Base	1.000
IEC61850 GOOSE Analog Input 12 Default Value	1000.000
IEC61850 GOOSE Analog Input 12 Mode	Default Value
IEC61850 GOOSE Analog Input 12 Units	
IEC61850 GOOSE Analog Input 12 PU Base	1.000
IEC61850 GOOSE Analog Input 13 Default Value	1000.000
IEC61850 GOOSE Analog Input 13 Mode	Default Value
IEC61850 GOOSE Analog Input 13 Units	
IEC61850 GOOSE Analog Input 13 PU Base	1.000
IEC61850 GOOSE Analog Input 14 Default Value	1000.000
IEC61850 GOOSE Analog Input 14 Mode	Default Value
IEC61850 GOOSE Analog Input 14 Units	
IEC61850 GOOSE Analog Input 14 PU Base	1.000
IEC61850 GOOSE Analog Input 15 Default Value	1000.000
IEC61850 GOOSE Analog Input 15 Mode	Default Value
IEC61850 GOOSE Analog Input 15 Units	
IEC61850 GOOSE Analog Input 15 PU Base	1.000
IEC61850 GOOSE Analog Input 16 Default Value	1000.000
IEC61850 GOOSE Analog Input 16 Mode	Default Value
IEC61850 GOOSE Analog Input 16 Units	
IEC61850 GOOSE Analog Input 16 PU Base	1.000
IEC61850 GOOSE Analog Input 17 Default Value	1000.000
IEC61850 GOOSE Analog Input 17 Mode	Default Value
IEC61850 GOOSE Analog Input 17 Units	
IEC61850 GOOSE Analog Input 17 PU Base	1.000
IEC61850 GOOSE Analog Input 18 Default Value	1000.000
IEC61850 GOOSE Analog Input 18 Mode	Default Value
IEC61850 GOOSE Analog Input 18 Units	
IEC61850 GOOSE Analog Input 18 PU Base	1.000
IEC61850 GOOSE Analog Input 19 Default Value	1000.000
IEC61850 GOOSE Analog Input 19 Mode	Default Value
IEC61850 GOOSE Analog Input 19 Units	
IEC61850 GOOSE Analog Input 19 PU Base	1.000
IEC61850 GOOSE Analog Input 20 Default Value	1000.000
IEC61850 GOOSE Analog Input 20 Mode	Default Value
IEC61850 GOOSE Analog Input 20 Units	

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TEXT COLOR

IEC 61850 GOOSE ANALOGS INPUTS (continued from last page)

IEC61850 GOOSE Analog Input 20 PU Base	1.000
IEC61850 GOOSE Analog Input 21 Default Value	1000.000
IEC61850 GOOSE Analog Input 21 Mode	Default Value
IEC61850 GOOSE Analog Input 21 Units	
IEC61850 GOOSE Analog Input 21 PU Base	1.000
IEC61850 GOOSE Analog Input 22 Default Value	1000.000
IEC61850 GOOSE Analog Input 22 Mode	Default Value
IEC61850 GOOSE Analog Input 22 Units	
IEC61850 GOOSE Analog Input 22 PU Base	1.000
IEC61850 GOOSE Analog Input 23 Default Value	1000.000
IEC61850 GOOSE Analog Input 23 Mode	Default Value
IEC61850 GOOSE Analog Input 23 Units	
IEC61850 GOOSE Analog Input 23 PU Base	1.000
IEC61850 GOOSE Analog Input 24 Default Value	1000.000
IEC61850 GOOSE Analog Input 24 Mode	Default Value
IEC61850 GOOSE Analog Input 24 Units	
IEC61850 GOOSE Analog Input 24 PU Base	1.000
IEC61850 GOOSE Analog Input 25 Default Value	1000.000
IEC61850 GOOSE Analog Input 25 Mode	Default Value
IEC61850 GOOSE Analog Input 25 Units	
IEC61850 GOOSE Analog Input 25 PU Base	1.000
IEC61850 GOOSE Analog Input 26 Default Value	1000.000
IEC61850 GOOSE Analog Input 26 Mode	Default Value
IEC61850 GOOSE Analog Input 26 Units	
IEC61850 GOOSE Analog Input 26 PU Base	1.000
IEC61850 GOOSE Analog Input 27 Default Value	1000.000
IEC61850 GOOSE Analog Input 27 Mode	Default Value
IEC61850 GOOSE Analog Input 27 Units	
IEC61850 GOOSE Analog Input 27 PU Base	1.000
IEC61850 GOOSE Analog Input 28 Default Value	1000.000
IEC61850 GOOSE Analog Input 28 Mode	Default Value
IEC61850 GOOSE Analog Input 28 Units	
IEC61850 GOOSE Analog Input 28 PU Base	1.000
IEC61850 GOOSE Analog Input 29 Default Value	1000.000
IEC61850 GOOSE Analog Input 29 Mode	Default Value
IEC61850 GOOSE Analog Input 29 Units	
IEC61850 GOOSE Analog Input 29 PU Base	1.000
IEC61850 GOOSE Analog Input 30 Default Value	1000.000
IEC61850 GOOSE Analog Input 30 Mode	Default Value
IEC61850 GOOSE Analog Input 30 Units	
IEC61850 GOOSE Analog Input 30 PU Base	1.000
IEC61850 GOOSE Analog Input 31 Default Value	1000.000
IEC61850 GOOSE Analog Input 31 Mode	Default Value
IEC61850 GOOSE Analog Input 31 Units	
IEC61850 GOOSE Analog Input 31 PU Base	1.000
IEC61850 GOOSE Analog Input 32 Default Value	1000.000
IEC61850 GOOSE Analog Input 32 Mode	Default Value
IEC61850 GOOSE Analog Input 32 Units	
IEC61850 GOOSE Analog Input 32 PU Base	1.000

IEC 61850 GOOSE UINTEGERS INPUTS

IEC61850 GOOSE UInteger Input 1 Default Value	1000
IEC61850 GOOSE UInteger Input 1 Mode	Default Value
IEC61850 GOOSE UInteger Input 2 Default Value	1000
IEC61850 GOOSE UInteger Input 2 Mode	Default Value
IEC61850 GOOSE UInteger Input 3 Default Value	1000
IEC61850 GOOSE UInteger Input 3 Mode	Default Value
IEC61850 GOOSE UInteger Input 4 Default Value	1000
IEC61850 GOOSE UInteger Input 4 Mode	Default Value
IEC61850 GOOSE UInteger Input 5 Default Value	1000
IEC61850 GOOSE UInteger Input 5 Mode	Default Value
IEC61850 GOOSE UInteger Input 6 Default Value	1000
IEC61850 GOOSE UInteger Input 6 Mode	Default Value
IEC61850 GOOSE UInteger Input 7 Default Value	1000
IEC61850 GOOSE UInteger Input 7 Mode	Default Value

URS A9 DESPUÏS DE CAMBIO DE AJUSTES 26.03.2015.URS
C:\USERS\MMISSENE\DESKTOP\MMM\ACTUALIZACIÝN CRAPS\TINGU\A9
DEVICE DEFINITION
FILES
ORDER CODE: D60-K03-HCH-F8L-H6U-M6U-P6U-U6U-W6T
VERSION: 5.7X
UR SERIAL NUMBER: AE5C09000046
SETTINGS SEND TO RELAY: SATURDAY, FEBRUARY 07, 2015 08:50:11
DESCRIPTION: (NONE)
TEXT COLOR

IEC 61850 GOOSE UINTEGERS INPUTS (continued from last page)

IEC61850 GOOSE UInteger Input 8 Default Value	1000
IEC61850 GOOSE UInteger Input 8 Mode	Default Value
IEC61850 GOOSE UInteger Input 9 Default Value	1000
IEC61850 GOOSE UInteger Input 9 Mode	Default Value
IEC61850 GOOSE UInteger Input 10 Default Value	1000
IEC61850 GOOSE UInteger Input 10 Mode	Default Value
IEC61850 GOOSE UInteger Input 11 Default Value	1000
IEC61850 GOOSE UInteger Input 11 Mode	Default Value
IEC61850 GOOSE UInteger Input 12 Default Value	1000
IEC61850 GOOSE UInteger Input 12 Mode	Default Value
IEC61850 GOOSE UInteger Input 13 Default Value	1000
IEC61850 GOOSE UInteger Input 13 Mode	Default Value
IEC61850 GOOSE UInteger Input 14 Default Value	1000
IEC61850 GOOSE UInteger Input 14 Mode	Default Value
IEC61850 GOOSE UInteger Input 15 Default Value	1000
IEC61850 GOOSE UInteger Input 15 Mode	Default Value
IEC61850 GOOSE UInteger Input 16 Default Value	1000
IEC61850 GOOSE UInteger Input 16 Mode	Default Value

CONTROL DE REVISIÓN DEL CRAP

REVISOR	FECHA	N° EAP	OBSERVACIONES
Max Missene M.	26-03-2015	Nº 02/2015	Normalización de ajustes con respecto al esquema de Teleprotecciones en el Sistema 2 protección GED60.
Max Missene M.	07-09-2015	Nº 75/2015	Cambio de ajustes para evitar que la Z1B actúe de forma instantánea en Sistema 1 protección Siemens 7SA61 .

Razón de TTCC/TTPP

TTCC: 1000/1

TTPP: $\frac{154000}{\sqrt{3}}/115/\frac{115}{\sqrt{3}}$

Particularidades de Ajustes

- No hay.

Max / Centro Sur / Tinguiririca / A10 Tingui V4.6 Var Var

MLFB:	7SA61215AB927PR4
Versión del juego de parámetros:	V04.63.04
Ruta del equipo:	C:\Siemens\Digsi4\D4PROJ\Max\P7DI\GV\ST\00000053
Autor:	
Creado el:	23.10.15 11:59:40
Mod. por última vez el:	23.10.15 12:06:42
Modo de operación:	Sin línea
Comentario:	
Valores de ajuste en:	Presentación secundaria de los valores

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1 Device Configuration

Nº	Función	Volumen
0103	Setting Group Change Option	Disabled
0110	Trip mode	1-/3pole
0114	Distance protection pickup program	Z< (quadrilateral)
0120	Power Swing detection	Enabled
0121	Teleprotection for Distance prot.	POTT
0122	DTT Direct Transfer Trip	Disabled
0124	Instantaneous HighSpeed SOTF Overcurrent	Enabled
0125	Weak Infeed (Trip and/or Echo)	Enabled
0126	Backup overcurrent	Time Overcurrent Curve IEC
0131	Earth fault overcurrent	Time Overcurrent Curve IEC
0132	Teleprotection for Earth fault overcurr.	Disabled
0133	Auto-Reclose Function	1 AR-cycle
0134	Auto-Reclose control mode	with Trip and Action time
0135	Synchronism and Voltage Check	Enabled
0136	Over / Underfrequency Protection	Disabled
0137	Under / Overvoltage Protection	Disabled
0138	Fault Locator	Enabled
0139	Breaker Failure Protection	Enabled
0140	Trip Circuit Supervision	Disabled
0142	Thermal overload protection	Disabled

2 Power System Data 1

2.1 Grupo Power System Data 1; Grupo Transformers

Grupo Power System Data 1; Grupo Transformers

Nº	Parámetro	Valor	Grupo
0201	CT Starpoint	towards Line	todo
0203	Rated Primary Voltage	154,0 kV	todo
0204	Rated Secondary Voltage (Ph-Ph)	115 V	todo
0205	CT Rated Primary Current	1000 A	todo
0206	CT Rated Secondary Current	1A	todo
0210	U4 voltage transformer is	Usy2 transformer	todo
0211	Matching ratio Phase-VT To Open-Delta-VT	0,58	todo
0212	VT connection for Usy2	L2-E	todo
0214A	Angle adjustment Usy2-Usy1	0 °	todo
0215	Matching ratio Usy1 / Usy2	1,00	todo
0220	I4 current transformer is	Neutral Current (of the protected line)	todo
0221	Matching ratio I4/Iph for CT's	1,000	todo

2.2 Grupo Power System Data 1; Grupo Power System

Grupo Power System Data 1; Grupo Power System

Nº	Parámetro	Valor	Grupo
0207	System Starpoint is	Solid Earthed	todo
0230	Rated Frequency	50 Hz	todo
0235	Phase Sequence	L1 L2 L3	todo
0236	Distance measurement unit	km	todo
0237	Setting format for zero seq.comp. format	Zero seq. comp. factor K0 and angle(K0)	todo
0238A	Earth Fault O/C: setting for 1pole AR	all stages together	todo

2.3 Grupo Power System Data 1; Grupo Breaker

Grupo Power System Data 1; Grupo Breaker

Nº	Parámetro	Valor	Grupo
0239	Closing (operating) time of CB	0,06 sec	todo
0240A	Minimum TRIP Command Duration	0,12 sec	todo
0241A	Maximum Close Command Duration	0,25 sec	todo
0242	Dead Time for CB test-autoreclosure	0,10 sec	todo

3 Grupos de parámetros

3.1 Grupo Power System Data 2; Grupo Power System

Grupo Power System Data 2; Grupo Power System

Nº	Parámetro	Valor	Grupo
1103	Measurement: Full Scale Voltage (100%)	154,0 kV	A
1104	Measurement: Full Scale Current (100%)	1000 A	A
1105	Line Angle	77 °	A
1211	Angle of inclination, distance charact.	77 °	A
1107	P,Q operational measured values sign	not reversed	A
1110	x' - Line Reactance per length unit	0,3050 Ohm / km	A
1111	Line Length	110,9 km	A
1120	Zero seq. comp. factor K0 for zone Z1	0,804	A
1121	Zero seq. comp. angle for zone Z1	4,64 °	A
1122	Zero seq.comp.factor K0,higher zones >Z1	0,804	A
1123	Zero seq. comp. angle, higher zones >Z1	4,64 °	A

3.2 Grupo Power System Data 2; Grupo Line Status

Grupo Power System Data 2; Grupo Line Status

Nº	Parámetro	Valor	Grupo
1130A	Pole Open Current Threshold	0,05 A	A
1131A	Pole Open Voltage Threshold	11 V	A
1132A	Seal-in Time after ALL closures	0,20 sec	A
1133A	minimal time for line open before SOTF	0,25 sec	A
1134	Recognition of Line Closures with	CBaux OR Current or Manual close BI	A
1135	RESET of Trip Command	with Pole Open Current Threshold only	A
1136	open pole detector	with measurement (U/I,trip,pickup,CBaux)	A
1140A	CT Saturation Threshold	oo A	A
1150A	Seal-in Time after MANUAL closures	0,20 sec	A
1151	Manual CLOSE COMMAND generation	NO	A
1152	MANUAL Closure Impulse after CONTROL	<none>	todo

3.3 Grupo Power System Data 2; Grupo Trip 1-/3-pole

Grupo Power System Data 2; Grupo Trip 1-/3-pole

Nº	Parámetro	Valor	Grupo
1155	3 pole coupling	with Trip	A
1156A	Trip type with 2phase faults	3pole	A

3.4 Grupo Distance protection, general settings; Grupo General

Grupo Distance protection, general settings; Grupo General

Nº	Parámetro	Valor	Grupo
1201	Distance protection	ON	A
1202	Phase Current threshold for dist. meas.	0,05 A	A
1211	Angle of inclination, distance charact.	77 °	A
1208	Series compensated line	NO	A
1232	Instantaneous trip after SwitchOnToFault	with Zone Z1B	A
1241	R load, minimum Load Impedance (ph-e)	oo Ohm	A
1242	PHI load, maximum Load Angle (ph-e)	35 °	A
1243	R load, minimum Load Impedance (ph-ph)	oo Ohm	A
1244	PHI load, maximum Load Angle (ph-ph)	35 °	A
1317A	Single pole trip for faults in Z2	NO	A
1357	Z1B enabled before 1st AR (int. or ext.)	NO	A

3.5 Grupo Distance protection, general settings; Grupo Earth faults

Grupo Distance protection, general settings; Grupo Earth faults

Nº	Parámetro	Valor	Grupo
1203	3I0 threshold for neutral current pickup	0,05 A	A
1204	3U0 threshold zero seq. voltage pickup	2 V	A
1207A	3I0>-pickup-stabilisation (3I0> /Iphmax)	0,10	A
1209A	criterion of earth fault recognition	3I0> OR 3U0>	A
1221A	Loop selection with 2Ph-E faults	all loops	A

3.6 Grupo Distance protection, general settings; Grupo Time Delays

Grupo Distance protection, general settings; Grupo Time Delays

Nº	Parámetro	Valor	Grupo
1210	Condition for zone timer start	with distance pickup	A
1305	T1-1phase, delay for single phase faults	0,00 sec	A
1306	T1multi-ph, delay for multi phase faults	0,00 sec	A
1315	T2-1phase, delay for single phase faults	0,60 sec	A
1316	T2multi-ph, delay for multi phase faults	0,60 sec	A
1325	T3 delay	2,50 sec	A
1335	T4 delay	1,50 sec	A
1345	T5 delay	oo sec	A
1355	T1B-1phase, delay for single ph. faults	0,00 sec	A
1356	T1B-multi-ph, delay for multi ph. faults	0,00 sec	A

3.7 Grupo Distance zones (quadrilateral); Grupo Zone Z1

Grupo Distance zones (quadrilateral); Grupo Zone Z1

Nº	Parámetro	Valor	Grupo
1301	Operating mode Z1	Forward	A
1302	R(Z1), Resistance for ph-ph-faults	19,494 Ohm	A
1303	X(Z1), Reactance	19,494 Ohm	A
1304	RE(Z1), Resistance for ph-e faults	19,494 Ohm	A
1305	T1-1phase, delay for single phase faults	0,00 sec	A
1306	T1multi-ph, delay for multi phase faults	0,00 sec	A
1307	Zone Reduction Angle (load compensation)	0 °	A

3.8 Grupo Distance zones (quadrilateral); Grupo Zone Z1B-exten.

Grupo Distance zones (quadrilateral); Grupo Zone Z1B-exten.

Nº	Parámetro	Valor	Grupo
1351	Operating mode Z1B (overrreach zone)	Forward	A
1352	R(Z1B), Resistance for ph-ph-faults	68,181 Ohm	A
1353	X(Z1B), Reactance	68,181 Ohm	A
1354	RE(Z1B), Resistance for ph-e faults	68,181 Ohm	A
1355	T1B-1phase, delay for single ph. faults	0,00 sec	A
1356	T1B-multi-ph, delay for multi ph. faults	0,00 sec	A
1357	Z1B enabled before 1st AR (int. or ext.)	NO	A

3.9 Grupo Distance zones (quadrilateral); Grupo Zone Z2

Grupo Distance zones (quadrilateral); Grupo Zone Z2

Nº	Parámetro	Valor	Grupo
1311	Operating mode Z2	Forward	A
1312	R(Z2), Resistance for ph-ph-faults	34,798 Ohm	A
1313	X(Z2), Reactance	34,798 Ohm	A
1314	RE(Z2), Resistance for ph-e faults	34,798 Ohm	A
1315	T2-1phase, delay for single phase faults	0,60 sec	A
1316	T2multi-ph, delay for multi phase faults	0,60 sec	A
1317A	Single pole trip for faults in Z2	NO	A

3.10 Grupo Distance zones (quadrilateral); Grupo Zone Z3

Grupo Distance zones (quadrilateral); Grupo Zone Z3

Nº	Parámetro	Valor	Grupo
1321	Operating mode Z3	Reverse	A
1322	R(Z3), Resistance for ph-ph-faults	67,750 Ohm	A
1323	X(Z3), Reactance	67,750 Ohm	A
1324	RE(Z3), Resistance for ph-e faults	67,750 Ohm	A
1325	T3 delay	2,50 sec	A

3.11 Grupo Distance zones (quadrilateral); Grupo Zone Z4

Grupo Distance zones (quadrilateral); Grupo Zone Z4

Nº	Parámetro	Valor	Grupo
1331	Operating mode Z4	Forward	A
1332	R(Z4), Resistance for ph-ph-faults	66,957 Ohm	A
1333	X(Z4), Reactance	66,957 Ohm	A
1334	RE(Z4), Resistance for ph-e faults	66,957 Ohm	A
1335	T4 delay	1,50 sec	A

3.12 Grupo Distance zones (quadrilateral); Grupo Zone Z5

Grupo Distance zones (quadrilateral); Grupo Zone Z5

Nº	Parámetro	Valor	Grupo
1341	Operating mode Z5	Non-Directional	A
1342	R(Z5), Resistance for ph-ph-faults	70,000 Ohm	A
1343	X(Z5)+, Reactance for Forward direction	70,000 Ohm	A
1344	RE(Z5), Resistance for ph-e faults	70,000 Ohm	A
1345	T5 delay	oo sec	A
1346	X(Z5)-, Reactance for Reverse direction	70,000 Ohm	A

3.13 Grupo Power Swing

Grupo Power Swing

Nº	Parámetro	Valor	Grupo
2002	Power Swing Operating mode	all zones blocked	A
2006	Power swing trip	NO	A
2007	Trip delay after Power Swing Blocking	0,10 sec	A

3.14 Grupo Teleprotection for Distance prot.

Grupo Teleprotection for Distance prot.

Nº	Parámetro	Valor	Grupo
2101	Teleprotection for Distance protection	ON	A
2102	Type of Line	Three Terminals	A
2103A	Time for send signal prolongation	0,10 sec	A
2109A	Transient Block.: Duration external flt.	0,03 sec	A
2110A	Transient Block.: Blk.T. after ext. flt.	0,17 sec	A

3.15 Grupo Instantaneous HighSpeed SOTF Overcurrent

Grupo Instantaneous HighSpeed SOTF Overcurrent

Nº	Parámetro	Valor	Grupo
2401	Inst. High Speed SOTF-O/C is	ON	A

Grupo Instantaneous HighSpeed SOTF Overcurrent(2)

Nº	Parámetro	Valor	Grupo
2404	I>>> Pickup	0,80 A	A

3.16 Grupo Weak Infeed (Trip and/or Echo)

Grupo Weak Infeed (Trip and/or Echo)

Nº	Parámetro	Valor	Grupo
2501	Weak Infeed function	Echo only	A
2502A	Trip / Echo Delay after carrier receipt	0,04 sec	A
2503A	Trip Extension / Echo Impulse time	0,10 sec	A
2504A	Echo Block Time	0,50 sec	A
2505	Undervoltage (ph-e)	24 V	A
2509	Echo logic: Dis and EF on common channel	NO	todo

3.17 Grupo Backup overcurrent; Grupo General

Grupo Backup overcurrent; Grupo General

Nº	Parámetro	Valor	Grupo
2601	Operating mode	ON:only active with Loss of VT sec. cir.	A
2680	Trip time delay after SOTF	0,00 sec	A

3.18 Grupo Backup overcurrent; Grupo I>>

Grupo Backup overcurrent; Grupo I>>

Nº	Parámetro	Valor	Grupo
2610	Iph>> Pickup	oo A	A
2611	T Iph>> Time delay	oo sec	A
2612	3I0>> Pickup	oo A	A
2613	T 3I0>> Time delay	oo sec	A
2614	Instantaneous trip via BI	NO	A
2615	Instantaneous trip after SwitchOnToFault	NO	A

3.19 Grupo Backup overcurrent; Grupo I>

Grupo Backup overcurrent; Grupo I>

Nº	Parámetro	Valor	Grupo
2620	Iph> Pickup	oo A	A
2621	T Iph> Time delay	oo sec	A
2622	3I0> Pickup	oo A	A
2623	T 3I0> Time delay	oo sec	A
2624	Instantaneous trip via Teleprot./BI	NO	A
2625	Instantaneous trip after SwitchOnToFault	NO	A

3.20 Grupo Backup overcurrent; Grupo Inverse

Grupo Backup overcurrent; Grupo Inverse

Nº	Parámetro	Valor	Grupo
2640	Ip> Pickup	0,72 A	A
2642	T Ip Time Dial	0,10 sec	A
2646	T Ip Additional Time Delay	0,00 sec	A
2650	3I0p Pickup	0,05 A	A
2652	T 3I0p Time Dial	0,30 sec	A
2656	T 3I0p Additional Time Delay	0,00 sec	A
2660	IEC Curve	Normal Inverse	A
2670	Instantaneous trip via Teleprot./BI	NO	A
2671	Instantaneous trip after SwitchOnToFault	NO	A

3.21 Grupo Backup overcurrent; Grupo I - STUB

Grupo Backup overcurrent; Grupo I - STUB

Nº	Parámetro	Valor	Grupo
2630	Iph> STUB Pickup	oo A	A
2631	T Iph STUB Time delay	oo sec	A
2632	3I0> STUB Pickup	oo A	A
2633	T 3I0 STUB Time delay	oo sec	A
2634	Instantaneous trip via Teleprot./BI	NO	A
2635	Instantaneous trip after SwitchOnToFault	NO	A

3.22 Grupo Measurement Supervision; Grupo Balance / Summ.

Grupo Measurement Supervision; Grupo Balance / Summ.

Nº	Parámetro	Valor	Grupo
2901	Measurement Supervision	ON	A
2902A	Voltage Threshold for Balance Monitoring	48 V	A
2903A	Balance Factor for Voltage Monitor	0,75	A
2904A	Current Balance Monitor	0,10 A	A
2905A	Balance Factor for Current Monitor	0,50	A
2906A	Summated Current Monitoring Threshold	0,06 A	A
2907A	Summated Current Monitoring Factor	0,10	A
2908A	T Balance Factor for Voltage Monitor	5 sec	A
2909A	T Current Balance Monitor	5 sec	A

3.23 Grupo Measurement Supervision; Grupo Fuse Fail. Mon.

Grupo Measurement Supervision; Grupo Fuse Fail. Mon.

Nº	Parámetro	Valor	Grupo
2910	Fuse Failure Monitor	ON	A
2911A	Minimum Voltage Threshold U>	29 V	A
2912A	Maximum Current Threshold I<	0,10 A	A
2913A	Maximum Voltage Threshold U< (3phase)	5 V	A
2914A	Delta Current Threshold (3phase)	0,06 A	A
2915	Voltage Failure Supervision	with current superv. and CBaux	A
2916A	Delay Voltage Failure Supervision	3,00 sec	A

3.24 Grupo Measurement Supervision; Grupo VT mcb

Grupo Measurement Supervision; Grupo VT mcb

Nº	Parámetro	Valor	Grupo
2921	VT mcb operating time	5 ms	A

3.25 Grupo Measurement Supervision; Grupo Load Angle

Grupo Measurement Supervision; Grupo Load Angle

Nº	Parámetro	Valor	Grupo
2941	Limit setting PhiA	200 °	A
2942	Limit setting PhiB	340 °	A
2943	Minimum value I1>	0,05 A	A
2944	Minimum value U1>	19 V	A

3.26 Grupo Earth fault overcurrent; Grupo General

Grupo Earth fault overcurrent; Grupo General

Nº	Parámetro	Valor	Grupo
3101	Earth Fault overcurrent function	ON	A
3102	Block E/F for Distance protection	NO	A
3174	Block E/F for Distance Protection Pickup	in each zone	A
3103	Block E/F for 1pole Dead time	YES	A
3104A	Stabilisation Slope with Iphase	10 %	A
3109	Single pole trip with earth flt.prot.	YES	A
3170	2nd harmonic ratio for inrush restraint	20 %	A
3171	Max.Current, overriding inrush restraint	4,50 A	A
3172	Instantaneous mode after SwitchOnToFault	with Pickup and direction	A
3173	Trip time delay after SOTF	0,00 sec	A

3.27 Grupo Earth fault overcurrent; Grupo 3I0>>>

Grupo Earth fault overcurrent; Grupo 3I0>>>

Nº	Parámetro	Valor	Grupo
3110	Operating mode	Inactive	A
3111	3I0>>> Pickup	4,00 A	A
3112	T 3I0>>> Time delay	0,30 sec	A
3113	Instantaneous trip via Teleprot./BI	NO	A
3114	Instantaneous trip after SwitchOnToFault	NO	A
3115	Inrush Blocking	NO	A

3.28 Grupo Earth fault overcurrent; Grupo 3I0>>

Grupo Earth fault overcurrent; Grupo 3I0>>

Nº	Parámetro	Valor	Grupo
3120	Operating mode	Inactive	A
3121	3I0>> Pickup	2,00 A	A
3122	T 3I0>> Time Delay	0,60 sec	A
3123	Instantaneous trip via Teleprot./BI	NO	A
3124	Instantaneous trip after SwitchOnToFault	NO	A
3125	Inrush Blocking	NO	A

3.29 Grupo Earth fault overcurrent; Grupo 3I0>

Grupo Earth fault overcurrent; Grupo 3I0>

Nº	Parámetro	Valor	Grupo
3130	Operating mode	Inactive	A
3131	3I0> Pickup	1,00 A	A
3132	T 3I0> Time Delay	0,90 sec	A
3133	Instantaneous trip via Teleprot./BI	NO	A
3134	Instantaneous trip after SwitchOnToFault	NO	A
3135	Inrush Blocking	NO	A

3.30 Grupo Earth fault overcurrent; Grupo 3I0 InverseTime

Grupo Earth fault overcurrent; Grupo 3I0 InverseTime

Nº	Parámetro	Valor	Grupo
3140	Operating mode	Forward	A
3141	3I0p Pickup	0,05 A	A
3143	3I0p Time Dial	0,30 sec	A
3147	Additional Time Delay	0,00 sec	A
3148	Instantaneous trip via Teleprot./BI	NO	A
3149	Instantaneous trip after SwitchOnToFault	NO	A
3150	Inrush Blocking	NO	A
3151	IEC Curve	Normal Inverse	A

3.31 Grupo Earth fault overcurrent; Grupo Direction

Grupo Earth fault overcurrent; Grupo Direction

Nº	Parámetro	Valor	Grupo
3160	Polarization	with U0 + IY or U2	A
3162A	ALPHA, lower angle for forward direction	338 °	A
3163A	BETA, upper angle for forward direction	122 °	A
3164	Min. zero seq.voltage 3U0 for polarizing	3,0 V	A
3166	Min. neg. seq. polarizing voltage 3U2	3,0 V	A
3167	Min. neg. seq. polarizing current 3I2	0,05 A	A
3168	Compensation angle PHI comp. for Sr	255 °	A
3169	Forward direction power threshold	0,9 VA	A

3.32 Grupo Automatic Reclosure; Grupo General

Grupo Automatic Reclosure; Grupo General

Nº	Parámetro	Valor	Grupo
3401	Auto-Reclose function	ON	A
3402	CB ready interrogation at 1st trip	YES	A
3403	Reclaim time after successful AR cycle	8,00 sec	A
3404	AR blocking duration after manual close	8,00 sec	A
3406	Evolving fault recognition	with Trip	A
3407	Evolving fault (during the dead time)	blocks AR	A
3408	AR start-signal monitoring time	0,20 sec	A
3409	Circuit Breaker (CB) Supervision Time	3,00 sec	A
3410	Send delay for remote close command	oo sec	A
3411A	Maximum dead time extension	oo sec	A

3.33 Grupo Automatic Reclosure; Grupo 1st AR-cyle

Grupo Automatic Reclosure; Grupo 1st AR-cyle

Nº	Parámetro	Valor	Grupo
3450	Start of AR allowed in this cycle	YES	A
3451	Action time	0,20 sec	A
3456	Dead time after 1pole trip	1,20 sec	A
3457	Dead time after 3pole trip	0,50 sec	A
3458	Dead time after evolving fault	1,00 sec	A
3459	CB ready interrogation before reclosing	YES	A
3460	Request for synchro-check after 3pole AR	YES	A

3.34 Grupo Automatic Reclosure; Grupo 3pTRIP/DLC/RDT

Grupo Automatic Reclosure; Grupo 3pTRIP/DLC/RDT

Nº	Parámetro	Valor	Grupo
3430	3pole TRIP by AR	YES	A
3431	Dead Line Check or Reduced Dead Time	Without	A
3438	Supervision time for dead/ live voltage	0,10 sec	A
3440	Voltage threshold for live line or bus	46 V	A
3441	Voltage threshold for dead line or bus	27 V	A

3.35 Grupo Automatic Reclosure; Grupo Start AR with..

Grupo Automatic Reclosure; Grupo Start AR with..

Nº	Parámetro	Valor	Grupo
3420	AR with distance protection	YES	A
3421	AR with switch-onto-fault overcurrent	NO	A
3422	AR with weak infeed tripping	NO	A
3423	AR with earth fault overcurrent prot.	NO	A
3425	AR with back-up overcurrent	NO	A

3.36 Grupo Synchronism and Voltage Check; Grupo General

Grupo Synchronism and Voltage Check; Grupo General

Nº	Parámetro	Valor	Grupo
3501	Synchronism and Voltage Check function	ON	A
3502	Voltage threshold dead line / bus	23 V	A
3503	Voltage threshold live line / bus	81 V	A
3504	Maximum permissible voltage	138 V	A
3507	Maximum duration of synchronism-check	1,00 sec	A
3508	Synchronous condition stability timer	0,10 sec	A
3509	Synchronizable circuit breaker	<none>	todo

3.37 Grupo Synchronism and Voltage Check; Grupo with AR

Grupo Synchronism and Voltage Check; Grupo with AR

Nº	Parámetro	Valor	Grupo
3510	Operating mode with AR	without consideration of CB closing time	A
3511	Maximum voltage difference	30,0 V	A
3512	Maximum frequency difference	0,10 Hz	A
3513	Maximum angle difference	30 °	A
3515A	AR at Usy2>, Usy1>, and Synchr.	YES	A
3516	AR at Usy1< and Usy2>	NO	A
3517	AR at Usy1> and Usy2<	NO	A
3518	AR at Usy1< and Usy2<	NO	A
3519	Override of any check before AR	NO	A

3.38 Grupo Synchronism and Voltage Check; Grupo Man.Close+CNTRL

Grupo Synchronism and Voltage Check; Grupo Man.Close+CNTRL

Nº	Parámetro	Valor	Grupo
3530	Operating mode with Man.Cl	without consideration of CB closing time	A
3531	Maximum voltage difference	9,5 V	A
3532	Maximum frequency difference	0,10 Hz	A
3533	Maximum angle difference	10 °	A
3535A	Manual Close at Usy2>, Usy1>, and Synchr	NO	A
3536	Manual Close at Usy1< and Usy2>	NO	A
3537	Manual Close at Usy1> and Usy2<	NO	A
3538	Manual Close at Usy1< and Usy2<	NO	A
3539	Override of any check before Man.Cl	NO	A

3.39 Grupo Fault Locator

Grupo Fault Locator

Nº	Parámetro	Valor	Grupo
3802	Start fault locator with	TRIP	A
3806	Load Compensation	YES	A

3.40 Grupo Breaker Failure; Grupo Breaker Failure

Grupo Breaker Failure; Grupo Breaker Failure

Nº	Parámetro	Valor	Grupo
3901	Breaker Failure Protection	ON	A
3902	Pick-up threshold I>	0,15 A	A
3903	1pole retrip with stage T1 (local trip)	NO	A
3904	T1, Delay after 1pole start (local trip)	0,01 sec	A
3905	T1, Delay after 3pole start (local trip)	0,01 sec	A
3906	T2, Delay of 2nd stage (busbar trip)	0,20 sec	A
3907	T3, Delay for start with defective bkr.	0,00 sec	A
3908	Trip output selection with defective bkr	NO	A
3909	Check Breaker contacts	YES	A

3.41 Grupo Breaker Failure; Grupo End fault prot.

Grupo Breaker Failure; Grupo End fault prot.

Nº	Parámetro	Valor	Grupo
3921	End fault protection	OFF	A
3922	Trip delay of end fault protection	2,00 sec	A

3.42 Grupo Breaker Failure; Grupo PoleDiscrepancy

Grupo Breaker Failure; Grupo PoleDiscrepancy

Nº	Parámetro	Valor	Grupo
3931	Pole Discrepancy supervision	OFF	A
3932	Trip delay with pole discrepancy	2,00 sec	A

URS A10 DESPUÏS DE CAMBIO DE AJUSTES 27.03.2015.URS
C:\USERS\MMISSENE\DESKTOP\MMM\ACTUALIZACIУN CRAPS\TINGU\A10
DEVICE DEFINITION
FILES
ORDER CODE: D60-K03-HCH-F8L-H6U-M6U-P6U-U6U-W6T
VERSION: 5.7X
UR SERIAL NUMBER: AE5C09000045
SETTINGS SEND TO RELAY: SATURDAY, FEBRUARY 07, 2015 09:58:17
DESCRIPTION: (NONE)
TEXT COLOR

RELAY INFORMATION

Main Firmware:	570
Boot Firmware:	301
Relay Serial Number:	AE5C09000045
CPU Serial Number:	A9KC09002059
F8L Module Serial Number	A8LC08003401
H6U Module Serial Number	A6UC08001818
M6U Module Serial Number	A6UC08001830
P6U Module Serial Number	A6UC08001831
U6U Module Serial Number	A6UC08001814
W6T Module Serial Number	A6TC08000923
Settings Send to Relay	Saturday, February 07, 2015 09:58:17

PRODUCT SETUP

SECURITY

Command Password	0
Setting Password	0
Command Password Access Timeout	5 min
Setting Password Access Timeout	30 min
Invalid Password Attempts	3
Password Lockout Duration	5 min
Password Access Events	Disabled
Local Setting Authorized	ON
Remote Setting Authorized	ON
Access Authorized Timeout	30 min

DISPLAY PROPERTIES

Flash Message Time	1.0 s
Default Message Timeout	300 s
Default Message Intensity (VFD Only)	25 %
Screen Saver Feature (LCD Only)	Enabled
Screen Saver Wait Time (LCD Only)	30 min
Current Cutoff Level	0.020 pu
Voltage Cutoff Level	1.0 V

COMMUNICATIONS

SERIAL PORTS

RS485 Com2 Baud Rate	19200
RS485 Com2 Parity	None
RS485 Com2 Response Min Time	0 ms

NETWORK

IP Address	192.168.104. 46
IP Subnet Mask	0. 0. 0. 0
Gateway IP Address	192.168.104. 1
Ethernet Operation Mode	Full-Duplex
OSI Network Address (NSAP)	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

MODBUS PROTOCOL

Modbus Slave Address	46
Modbus TCP Port Number	502

DNP PROTOCOL

DNP Channel 1 Port	NETWORK - TCP
DNP Channel 2 Port	NONE
DNP Address	46
DNP Client Address 1	192.168.104.101
DNP Client Address 2	0. 0. 0. 0
DNP Client Address 3	0. 0. 0. 0
DNP Client Address 4	0. 0. 0. 0
DNP Client Address 5	0. 0. 0. 0
DNP TCP/UDP Port Number	20000
DNP Unsol Resp Function	Disabled
DNP Unsol Resp Timeout	5 s
DNP Unsol Resp Max Retries	10
DNP Unsol Resp Dest Addr	1

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DNP PROTOCOL (continued from last page)

DNP Current Scale Factor	1
DNP Voltage Scale Factor	1
DNP Power Scale Factor	1
DNP Energy Scale Factor	1
DNP Power Factor Scale Factor	1
DNP Other Scale Factor	1
DNP Current Default Deadband	30000
DNP Voltage Default Deadband	30000
DNP Power Default Deadband	30000
DNP Energy Default Deadband	30000
DNP Power Factor Default Deadband	30000
DNP Other Default Deadband	30000
DNP Time Sync IIN Period	1440 min
DNP Message Fragment Size	240
DNP Object 1 Default Variation	2
DNP Object 2 Default Variation	2
DNP Object 20 Default Variation	1
DNP Object 21 Default Variation	1
DNP Object 22 Default Variation	1
DNP Object 23 Default Variation	1
DNP Object 30 Default Variation	1
DNP Object 32 Default Variation	1
DNP Number of Paired Controls	0
DNP TCP Connection Timeout	120 s

DNP - IEC104 POINTS LISTS

DNP Binary Input Point 0	DNP 79 BLOQ On (VO30)
DNP Binary Input Point 1	DNP 79 ON On (VO31)
DNP Binary Input Point 2	DNP TP LINEA On (VO32)
DNP Binary Input Point 3	DNP TP BARRA On (VO33)
DNP Binary Input Point 4	DNP RX RAN On (VO34)
DNP Binary Input Point 5	DNP TX 85A On (VO35)
DNP Binary Input Point 6	DNP RX JAH On (VO36)
DNP Binary Input Point 7	DNP ECHO On (VO37)
DNP Binary Input Point 8	DNP 79 CLOSE On (VO38)
DNP Binary Input Point 9	DNP 21/21N On (VO39)
DNP Binary Input Point 10	DNP 67N On (VO40)
DNP Binary Input Point 11	DNP 50BF On (VO41)
DNP Binary Input Point 12	DNP Z1B On (VO42)
DNP Binary Input Point 13	DNP Z1 On (VO43)
DNP Binary Input Point 14	DNP Z2 On (VO44)
DNP Binary Input Point 15	DNP Z3 On (VO45)
DNP Binary Input Point 16	DNP Z4 On (VO46)
DNP Binary Input Point 17	DNP 51/51N On (VO47)
DNP Binary Input Point 18	DNP TRIP A On (VO48)
DNP Binary Input Point 19	DNP TRIP B On (VO49)
DNP Binary Input Point 20	DNP TRIP C On (VO50)
DNP Binary Input Point 21	DNP TRIP GND On (VO51)
DNP Binary Input Point 22	DNP TRIP S1 On (VO52)
DNP Binary Input Point 23	DNP PICKUP On (VO53)
DNP Binary Input Point 24	DNP MOD EMER On (VO54)
DNP Binary Input Point 25	DNP SOTF On (VO55)
DNP Binary Input Point 26	DNP VT FAIL On (VO56)
DNP Binary Input Point 27	DNP PSWING On (VO57)
DNP Binary Input Point 28	DNP 79BLQ EX On (VO58)
DNP Binary Input Point 29	DNP RX85D On (VO59)
DNP Binary Input Point 30	DNP TX85D On (VO60)
DNP Binary Input Point 31	DNP INC PCOR On (VO61)
DNP Analog Input Point 0	Fault Location [1]

IEC 61850
GSSE / GOOSE CONFIGURATION
TRANSMISSION
GENERAL

Default GSSE/GOOSE Update Time	60 s

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ORDER CODE: D60-K03-HCH-F8L-H6U-M6U-P6U-U6U-W6T
VERSION: 5.7X
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SETTINGS SEND TO RELAY: SATURDAY, FEBRUARY 07, 2015 09:58:17
DESCRIPTION: (NONE)
TEXT COLOR

GSSE

Function	Enabled
ID	GSSEOut
Destination MAC	00 00 00 00 00 00

TX CONFIGURABLE GOOSE

GOOSEOut 1 Function	Enabled
GOOSEOut 1 ID	GOOSEOut_1
GOOSEOut 1 Destination MAC	00 00 00 00 00 00
GOOSEOut 1 VLAN Priority	4
GOOSEOut 1 VLAN ID	0
GOOSEOut 1 ETYPE APPID	0
GOOSEOut 1 ConfRev	1
GOOSEOut 1 Retransmission Curve	Relaxed
GOOSEOut 2 Function	Enabled
GOOSEOut 2 ID	GOOSEOut_2
GOOSEOut 2 Destination MAC	00 00 00 00 00 00
GOOSEOut 2 VLAN Priority	4
GOOSEOut 2 VLAN ID	0
GOOSEOut 2 ETYPE APPID	0
GOOSEOut 2 ConfRev	1
GOOSEOut 2 Retransmission Curve	Relaxed
GOOSEOut 3 Function	Enabled
GOOSEOut 3 ID	GOOSEOut_3
GOOSEOut 3 Destination MAC	00 00 00 00 00 00
GOOSEOut 3 VLAN Priority	4
GOOSEOut 3 VLAN ID	0
GOOSEOut 3 ETYPE APPID	0
GOOSEOut 3 ConfRev	1
GOOSEOut 3 Retransmission Curve	Relaxed
GOOSEOut 4 Function	Enabled
GOOSEOut 4 ID	GOOSEOut_4
GOOSEOut 4 Destination MAC	00 00 00 00 00 00
GOOSEOut 4 VLAN Priority	4
GOOSEOut 4 VLAN ID	0
GOOSEOut 4 ETYPE APPID	0
GOOSEOut 4 ConfRev	1
GOOSEOut 4 Retransmission Curve	Relaxed
GOOSEOut 5 Function	Enabled
GOOSEOut 5 ID	GOOSEOut_5
GOOSEOut 5 Destination MAC	00 00 00 00 00 00
GOOSEOut 5 VLAN Priority	4
GOOSEOut 5 VLAN ID	0
GOOSEOut 5 ETYPE APPID	0
GOOSEOut 5 ConfRev	1
GOOSEOut 5 Retransmission Curve	Relaxed
GOOSEOut 6 Function	Enabled
GOOSEOut 6 ID	GOOSEOut_6
GOOSEOut 6 Destination MAC	00 00 00 00 00 00
GOOSEOut 6 VLAN Priority	4
GOOSEOut 6 VLAN ID	0
GOOSEOut 6 ETYPE APPID	0
GOOSEOut 6 ConfRev	1
GOOSEOut 6 Retransmission Curve	Relaxed
GOOSEOut 7 Function	Enabled
GOOSEOut 7 ID	GOOSEOut_7
GOOSEOut 7 Destination MAC	00 00 00 00 00 00
GOOSEOut 7 VLAN Priority	4
GOOSEOut 7 VLAN ID	0
GOOSEOut 7 ETYPE APPID	0
GOOSEOut 7 ConfRev	1
GOOSEOut 7 Retransmission Curve	Relaxed
GOOSEOut 8 Function	Enabled
GOOSEOut 8 ID	GOOSEOut_8
GOOSEOut 8 Destination MAC	00 00 00 00 00 00

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DEVICE DEFINITION
FILES
ORDER CODE: D60-K03-HCH-F8L-H6U-M6U-P6U-U6U-W6T
VERSION: 5.7X
UR SERIAL NUMBER: AE5C09000045
SETTINGS SEND TO RELAY: SATURDAY, FEBRUARY 07, 2015 09:58:17
DESCRIPTION: (NONE)
TEXT COLOR

TX CONFIGURABLE GOOSE (continued from last page)	
GOOSEOut 8 VLAN Priority	4
GOOSEOut 8 VLAN ID	0
GOOSEOut 8 ETYPE APPID	0
GOOSEOut 8 ConfRev	1
GOOSEOut 8 Retransmission Curve	Relaxed

SERVER CONFIGURATION	
IEDName	IEDName
Logical Device Instance	LDInst
MMS TCP Port Number	102
LPHD DC PhyNam location	Location

MMXU DEADBANDS	
MMXU1: TotW Deadband	10.000 %
MMXU1: TotVAr Deadband	10.000 %
MMXU1: TotVA Deadband	10.000 %
MMXU1: TotPF Deadband	10.000 %
MMXU1: Hz Deadband	10.000 %
MMXU1: PPV phsAB Deadband	10.000 %
MMXU1: PPV phsBC Deadband	10.000 %
MMXU1: PPV phsCA Deadband	10.000 %
MMXU1: PhV phsA Deadband	10.000 %
MMXU1: PhV phsB Deadband	10.000 %
MMXU1: PhV phsC Deadband	10.000 %
MMXU1: A phsA Deadband	10.000 %
MMXU1: A phsB Deadband	10.000 %
MMXU1: A phsC Deadband	10.000 %
MMXU1: A neut Deadband	10.000 %
MMXU1: W phsA Deadband	10.000 %
MMXU1: W phsB Deadband	10.000 %
MMXU1: W phsC Deadband	10.000 %
MMXU1: VAr phsA Deadband	10.000 %
MMXU1: VAr phsB Deadband	10.000 %
MMXU1: VAr phsC Deadband	10.000 %
MMXU1: VA phsA Deadband	10.000 %
MMXU1: VA phsB Deadband	10.000 %
MMXU1: VA phsC Deadband	10.000 %
MMXU1: PF phsA Deadband	10.000 %
MMXU1: PF phsB Deadband	10.000 %
MMXU1: PF phsC Deadband	10.000 %
MMXU2: TotW Deadband	10.000 %
MMXU2: TotVAr Deadband	10.000 %
MMXU2: TotVA Deadband	10.000 %
MMXU2: TotPF Deadband	10.000 %
MMXU2: Hz Deadband	10.000 %
MMXU2: PPV phsAB Deadband	10.000 %
MMXU2: PPV phsBC Deadband	10.000 %
MMXU2: PPV phsCA Deadband	10.000 %
MMXU2: PhV phsA Deadband	10.000 %
MMXU2: PhV phsB Deadband	10.000 %
MMXU2: PhV phsC Deadband	10.000 %
MMXU2: A phsA Deadband	10.000 %
MMXU2: A phsB Deadband	10.000 %
MMXU2: A phsC Deadband	10.000 %
MMXU2: A neut Deadband	10.000 %
MMXU2: W phsA Deadband	10.000 %
MMXU2: W phsB Deadband	10.000 %
MMXU2: W phsC Deadband	10.000 %
MMXU2: VAr phsA Deadband	10.000 %
MMXU2: VAr phsB Deadband	10.000 %
MMXU2: VAr phsC Deadband	10.000 %
MMXU2: VA phsA Deadband	10.000 %
MMXU2: VA phsB Deadband	10.000 %
MMXU2: VA phsC Deadband	10.000 %
MMXU2: PF phsA Deadband	10.000 %

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DEVICE DEFINITION
FILES
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VERSION: 5.7X
UR SERIAL NUMBER: AE5C09000045
SETTINGS SEND TO RELAY: SATURDAY, FEBRUARY 07, 2015 09:58:17
DESCRIPTION: (NONE)
TEXT COLOR

MMXU DEADBANDS (continued from last page)

MMXU2: PF phsB Deadband	10.000 %
MMXU2: PF phsC Deadband	10.000 %

GGIO1 STATUS CONFIGURATION

Number of Status Points	8

GGIO2 CONTROL CONFIGURATION

SPCSO 1 ctlModel	1
SPCSO 2 ctlModel	1
SPCSO 3 ctlModel	1
SPCSO 4 ctlModel	1
SPCSO 5 ctlModel	1
SPCSO 6 ctlModel	1
SPCSO 7 ctlModel	1
SPCSO 8 ctlModel	1
SPCSO 9 ctlModel	1
SPCSO 10 ctlModel	1
SPCSO 11 ctlModel	1
SPCSO 12 ctlModel	1
SPCSO 13 ctlModel	1
SPCSO 14 ctlModel	1
SPCSO 15 ctlModel	1
SPCSO 16 ctlModel	1
SPCSO 17 ctlModel	1
SPCSO 18 ctlModel	1
SPCSO 19 ctlModel	1
SPCSO 20 ctlModel	1
SPCSO 21 ctlModel	1
SPCSO 22 ctlModel	1
SPCSO 23 ctlModel	1
SPCSO 24 ctlModel	1
SPCSO 25 ctlModel	1
SPCSO 26 ctlModel	1
SPCSO 27 ctlModel	1
SPCSO 28 ctlModel	1
SPCSO 29 ctlModel	1
SPCSO 30 ctlModel	1
SPCSO 31 ctlModel	1
SPCSO 32 ctlModel	1
SPCSO 33 ctlModel	1
SPCSO 34 ctlModel	1
SPCSO 35 ctlModel	1
SPCSO 36 ctlModel	1
SPCSO 37 ctlModel	1
SPCSO 38 ctlModel	1
SPCSO 39 ctlModel	1
SPCSO 40 ctlModel	1
SPCSO 41 ctlModel	1
SPCSO 42 ctlModel	1
SPCSO 43 ctlModel	1
SPCSO 44 ctlModel	1
SPCSO 45 ctlModel	1
SPCSO 46 ctlModel	1
SPCSO 47 ctlModel	1
SPCSO 48 ctlModel	1
SPCSO 49 ctlModel	1
SPCSO 50 ctlModel	1
SPCSO 51 ctlModel	1
SPCSO 52 ctlModel	1
SPCSO 53 ctlModel	1
SPCSO 54 ctlModel	1
SPCSO 55 ctlModel	1
SPCSO 56 ctlModel	1
SPCSO 57 ctlModel	1
SPCSO 58 ctlModel	1

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DEVICE DEFINITION
FILES
ORDER CODE: D60-K03-HCH-F8L-H6U-M6U-P6U-U6U-W6T
VERSION: 5.7X
UR SERIAL NUMBER: AE5C09000045
SETTINGS SEND TO RELAY: SATURDAY, FEBRUARY 07, 2015 09:58:17
DESCRIPTION: (NONE)
TEXT COLOR

GGIO2 CONTROL CONFIGURATION (continued from last page)

SPCSO 59 ctlModel	1
SPCSO 60 ctlModel	1
SPCSO 61 ctlModel	1
SPCSO 62 ctlModel	1
SPCSO 63 ctlModel	1
SPCSO 64 ctlModel	1

GGIO4 ANALOG CONFIGURATION

IEC61850 GGIO4 Analogs	4
IEC61850 GGIO4 Analog 1 Value	OFF
IEC61850 GGIO4 Analog 1 db	100.000 %
IEC61850 GGIO4 Analog 1 min	0.000
IEC61850 GGIO4 Analog 1 max	1000000.000
IEC61850 GGIO4 Analog 2 Value	OFF
IEC61850 GGIO4 Analog 2 db	100.000 %
IEC61850 GGIO4 Analog 2 min	0.000
IEC61850 GGIO4 Analog 2 max	1000000.000
IEC61850 GGIO4 Analog 3 Value	OFF
IEC61850 GGIO4 Analog 3 db	100.000 %
IEC61850 GGIO4 Analog 3 min	0.000
IEC61850 GGIO4 Analog 3 max	1000000.000
IEC61850 GGIO4 Analog 4 Value	OFF
IEC61850 GGIO4 Analog 4 db	100.000 %
IEC61850 GGIO4 Analog 4 min	0.000
IEC61850 GGIO4 Analog 4 max	1000000.000
IEC61850 GGIO4 Analog 5 Value	OFF
IEC61850 GGIO4 Analog 5 db	100.000 %
IEC61850 GGIO4 Analog 5 min	0.000
IEC61850 GGIO4 Analog 5 max	1000000.000
IEC61850 GGIO4 Analog 6 Value	OFF
IEC61850 GGIO4 Analog 6 db	100.000 %
IEC61850 GGIO4 Analog 6 min	0.000
IEC61850 GGIO4 Analog 6 max	1000000.000
IEC61850 GGIO4 Analog 7 Value	OFF
IEC61850 GGIO4 Analog 7 db	100.000 %
IEC61850 GGIO4 Analog 7 min	0.000
IEC61850 GGIO4 Analog 7 max	1000000.000
IEC61850 GGIO4 Analog 8 Value	OFF
IEC61850 GGIO4 Analog 8 db	100.000 %
IEC61850 GGIO4 Analog 8 min	0.000
IEC61850 GGIO4 Analog 8 max	1000000.000
IEC61850 GGIO4 Analog 9 Value	OFF
IEC61850 GGIO4 Analog 9 db	100.000 %
IEC61850 GGIO4 Analog 9 min	0.000
IEC61850 GGIO4 Analog 9 max	1000000.000
IEC61850 GGIO4 Analog 10 Value	OFF
IEC61850 GGIO4 Analog 10 db	100.000 %
IEC61850 GGIO4 Analog 10 min	0.000
IEC61850 GGIO4 Analog 10 max	1000000.000
IEC61850 GGIO4 Analog 11 Value	OFF
IEC61850 GGIO4 Analog 11 db	100.000 %
IEC61850 GGIO4 Analog 11 min	0.000
IEC61850 GGIO4 Analog 11 max	1000000.000
IEC61850 GGIO4 Analog 12 Value	OFF
IEC61850 GGIO4 Analog 12 db	100.000 %
IEC61850 GGIO4 Analog 12 min	0.000
IEC61850 GGIO4 Analog 12 max	1000000.000
IEC61850 GGIO4 Analog 13 Value	OFF
IEC61850 GGIO4 Analog 13 db	100.000 %
IEC61850 GGIO4 Analog 13 min	0.000
IEC61850 GGIO4 Analog 13 max	1000000.000
IEC61850 GGIO4 Analog 14 Value	OFF
IEC61850 GGIO4 Analog 14 db	100.000 %
IEC61850 GGIO4 Analog 14 min	0.000
IEC61850 GGIO4 Analog 14 max	1000000.000

URS A10 DESPUÏS DE CAMBIO DE AJUSTES 27.03.2015.URS
C:\USERS\MMISSENE\DESKTOP\MMM\ACTUALIZACIУN CRAPS\TINGU\A10
DEVICE DEFINITION
FILES
ORDER CODE: D60-K03-HCH-F8L-H6U-M6U-P6U-U6U-W6T
VERSION: 5.7X
UR SERIAL NUMBER: AE5C09000045
SETTINGS SEND TO RELAY: SATURDAY, FEBRUARY 07, 2015 09:58:17
DESCRIPTION: (NONE)
TEXT COLOR

GGIO4 ANALOG CONFIGURATION (continued from last page)

IEC61850 GGIO4 Analog 15 Value	OFF
IEC61850 GGIO4 Analog 15 db	100.000 %
IEC61850 GGIO4 Analog 15 min	0.000
IEC61850 GGIO4 Analog 15 max	1000000.000
IEC61850 GGIO4 Analog 16 Value	OFF
IEC61850 GGIO4 Analog 16 db	100.000 %
IEC61850 GGIO4 Analog 16 min	0.000
IEC61850 GGIO4 Analog 16 max	1000000.000
IEC61850 GGIO4 Analog 17 Value	OFF
IEC61850 GGIO4 Analog 17 db	100.000 %
IEC61850 GGIO4 Analog 17 min	0.000
IEC61850 GGIO4 Analog 17 max	1000000.000
IEC61850 GGIO4 Analog 18 Value	OFF
IEC61850 GGIO4 Analog 18 db	100.000 %
IEC61850 GGIO4 Analog 18 min	0.000
IEC61850 GGIO4 Analog 18 max	1000000.000
IEC61850 GGIO4 Analog 19 Value	OFF
IEC61850 GGIO4 Analog 19 db	100.000 %
IEC61850 GGIO4 Analog 19 min	0.000
IEC61850 GGIO4 Analog 19 max	1000000.000
IEC61850 GGIO4 Analog 20 Value	OFF
IEC61850 GGIO4 Analog 20 db	100.000 %
IEC61850 GGIO4 Analog 20 min	0.000
IEC61850 GGIO4 Analog 20 max	1000000.000
IEC61850 GGIO4 Analog 21 Value	OFF
IEC61850 GGIO4 Analog 21 db	100.000 %
IEC61850 GGIO4 Analog 21 min	0.000
IEC61850 GGIO4 Analog 21 max	1000000.000
IEC61850 GGIO4 Analog 22 Value	OFF
IEC61850 GGIO4 Analog 22 db	100.000 %
IEC61850 GGIO4 Analog 22 min	0.000
IEC61850 GGIO4 Analog 22 max	1000000.000
IEC61850 GGIO4 Analog 23 Value	OFF
IEC61850 GGIO4 Analog 23 db	100.000 %
IEC61850 GGIO4 Analog 23 min	0.000
IEC61850 GGIO4 Analog 23 max	1000000.000
IEC61850 GGIO4 Analog 24 Value	OFF
IEC61850 GGIO4 Analog 24 db	100.000 %
IEC61850 GGIO4 Analog 24 min	0.000
IEC61850 GGIO4 Analog 24 max	1000000.000
IEC61850 GGIO4 Analog 25 Value	OFF
IEC61850 GGIO4 Analog 25 db	100.000 %
IEC61850 GGIO4 Analog 25 min	0.000
IEC61850 GGIO4 Analog 25 max	1000000.000
IEC61850 GGIO4 Analog 26 Value	OFF
IEC61850 GGIO4 Analog 26 db	100.000 %
IEC61850 GGIO4 Analog 26 min	0.000
IEC61850 GGIO4 Analog 26 max	1000000.000
IEC61850 GGIO4 Analog 27 Value	OFF
IEC61850 GGIO4 Analog 27 db	100.000 %
IEC61850 GGIO4 Analog 27 min	0.000
IEC61850 GGIO4 Analog 27 max	1000000.000
IEC61850 GGIO4 Analog 28 Value	OFF
IEC61850 GGIO4 Analog 28 db	100.000 %
IEC61850 GGIO4 Analog 28 min	0.000
IEC61850 GGIO4 Analog 28 max	1000000.000
IEC61850 GGIO4 Analog 29 Value	OFF
IEC61850 GGIO4 Analog 29 db	100.000 %
IEC61850 GGIO4 Analog 29 min	0.000
IEC61850 GGIO4 Analog 29 max	1000000.000
IEC61850 GGIO4 Analog 30 Value	OFF
IEC61850 GGIO4 Analog 30 db	100.000 %
IEC61850 GGIO4 Analog 30 min	0.000
IEC61850 GGIO4 Analog 30 max	1000000.000
IEC61850 GGIO4 Analog 31 Value	OFF

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FILES
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VERSION: 5.7X
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SETTINGS SEND TO RELAY: SATURDAY, FEBRUARY 07, 2015 09:58:17
DESCRIPTION: (NONE)
TEXT COLOR

GGIO4 ANALOG CONFIGURATION (continued from last page)

IEC61850 GGIO4 Analog 31 db	100.000 %
IEC61850 GGIO4 Analog 31 min	0.000
IEC61850 GGIO4 Analog 31 max	1000000.000
IEC61850 GGIO4 Analog 32 Value	OFF
IEC61850 GGIO4 Analog 32 db	100.000 %
IEC61850 GGIO4 Analog 32 min	0.000
IEC61850 GGIO4 Analog 32 max	1000000.000

REPORT CONTROL CONFIGURATION

REPORT 1 (GGIO1.BR): RptID	
REPORT 1 (GGIO1.BR): OptFlds	0
REPORT 1 (GGIO1.BR): BufTm	0
REPORT 1 (GGIO1.BR): TrgOps	0
REPORT 1 (GGIO1.BR): IntgPd	0
REPORT 2 (GGIO1.BR01): RptID	
REPORT 2 (GGIO1.BR01): OptFlds	0
REPORT 2 (GGIO1.BR01): BufTm	0
REPORT 2 (GGIO1.BR01): TrgOps	0
REPORT 2 (GGIO1.BR01): IntgPd	0
REPORT 3 (GGIO1.RP): RptID	
REPORT 3 (GGIO1.RP): OptFlds	0
REPORT 3 (GGIO1.RP): BufTm	0
REPORT 3 (GGIO1.RP): TrgOps	0
REPORT 3 (GGIO1.RP): IntgPd	0
REPORT 4 (GGIO4.RP): RptID	
REPORT 4 (GGIO4.RP): OptFlds	0
REPORT 4 (GGIO4.RP): BufTm	0
REPORT 4 (GGIO4.RP): TrgOps	0
REPORT 4 (GGIO4.RP): IntgPd	0
REPORT 5 (MMXU1.BR): RptID	
REPORT 5 (MMXU1.BR): OptFlds	0
REPORT 5 (MMXU1.BR): BufTm	0
REPORT 5 (MMXU1.BR): TrgOps	0
REPORT 5 (MMXU1.BR): IntgPd	0
REPORT 6 (MMXU1.RP): RptID	
REPORT 6 (MMXU1.RP): OptFlds	0
REPORT 6 (MMXU1.RP): BufTm	0
REPORT 6 (MMXU1.RP): TrgOps	0
REPORT 6 (MMXU1.RP): IntgPd	0
REPORT 7 (MMXU2.BR): RptID	
REPORT 7 (MMXU2.BR): OptFlds	0
REPORT 7 (MMXU2.BR): BufTm	0
REPORT 7 (MMXU2.BR): TrgOps	0
REPORT 7 (MMXU2.BR): IntgPd	0
REPORT 8 (MMXU2.RP): RptID	
REPORT 8 (MMXU2.RP): OptFlds	0
REPORT 8 (MMXU2.RP): BufTm	0
REPORT 8 (MMXU2.RP): TrgOps	0
REPORT 8 (MMXU2.RP): IntgPd	0

XCBR CONFIGURATION

XCBR1 ST.Loc Operand	OFF
Clear XCBR1 OpCnt	No
XCBR2 ST.Loc Operand	OFF
Clear XCBR2 OpCnt	No

XSWI CONFIGURATION

XSWI1 ST.Loc Operand	OFF
XSWI2 ST.Loc Operand	OFF
XSWI3 ST.Loc Operand	OFF
XSWI4 ST.Loc Operand	OFF
XSWI5 ST.Loc Operand	OFF
XSWI6 ST.Loc Operand	OFF
XSWI7 ST.Loc Operand	OFF
XSWI8 ST.Loc Operand	OFF

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VERSION: 5.7X
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SETTINGS SEND TO RELAY: SATURDAY, FEBRUARY 07, 2015 09:58:17
DESCRIPTION: (NONE)
TEXT COLOR

XSWI CONFIGURATION (continued from last page)

Clear XSWI1 OpCnt	No
Clear XSWI2 OpCnt	No
Clear XSWI3 OpCnt	No
Clear XSWI4 OpCnt	No
Clear XSWI5 OpCnt	No
Clear XSWI6 OpCnt	No
Clear XSWI7 OpCnt	No
Clear XSWI8 OpCnt	No

HTTP

HTTP TCP Port Number	80

TFTP

TFTP Main UDP Port Number	69
TFTP Data UDP Port Number 1	0
TFTP Data UDP Port Number 2	0

SNTP

Function	Enabled
Server IP Address	192.168.104.105
UDP Port Number	123

REAL TIME CLOCK

IRIG-B Signal Type	None
Real Time Clock Events	Disabled
Time Zone Offset	-4.0 hr
DST Function	Enabled
DST Start Month	October
DST Start Day	Saturday
DST Start Day Instance	Second
DST Start Hour	0
DST Stop Month	March
DST Stop Day	Saturday
DST Stop Day Instance	Second
DST Stop Hour	0

FAULT REPORT

Fault Report 1 Source	SRC 1 (SRC 1)
Fault Report 1 Trigger	TRIP OUTPUT OP
Fault Report 1 Positive Seq (Z1) Mag	33.82 ohms
Fault Report 1 Positive Seq (Z1) Angle	77 deg
Fault Report 1 Zero Seq (Z0) Mag	33.82 ohms
Fault Report 1 Zero Seq (Z0) Angle	77 deg
Fault Report 1 Line Length Units	km
Fault Report 1 Line Length	110.9
Fault Report 1 VT Substitution	None
Fault Report 1 System Z0 Mag	2.00 ohms
Fault Report 1 System Z0 Angle	75 deg

OSCILLOGRAPHY

Number Of Records	5
Trigger Mode	Automatic Overwrite
Trigger Position	30 %
Trigger Source	Osc Trigger On (VO64)
AC Input Waveforms	32 samples/cycle
Digital Channel 1	PH DIR1 BLK
Digital Channel 2	PH DIST Z1 OP
Digital Channel 3	GND DIST Z1 OP
Digital Channel 4	PH DIST Z2 OP
Digital Channel 5	GND DIST Z2 OP
Digital Channel 6	PH DIST Z3 OP
Digital Channel 7	GND DIST Z3 OP
Digital Channel 8	PH DIST Z4 OP
Digital Channel 9	GND DIST Z4 OP
Digital Channel 10	PH DIST Z5 OP

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VERSION: 5.7X
UR SERIAL NUMBER: AE5C09000045
SETTINGS SEND TO RELAY: SATURDAY, FEBRUARY 07, 2015 09:58:17
DESCRIPTION: (NONE)
TEXT COLOR

OSCILLOGRAPHY (continued from last page)

Digital Channel 11	GND DIST Z5 OP
Digital Channel 12	LINE PICKUP OP
Digital Channel 13	POWER SWING BLOCK
Digital Channel 14	NEUTRAL TOC1 OP
Digital Channel 15	PHASE TOC1 OP
Digital Channel 16	NEUTRAL TOC2 OP
Digital Channel 17	52A10 Abiert On(M7a)
Digital Channel 18	Falla TP Lin On(U7a)
Digital Channel 19	Rx. 85A1 On(U8a)
Digital Channel 20	POTT TX1
Digital Channel 21	Rx. 85D On(U8c)
Digital Channel 22	BKR FAIL 1 T1 OP
Digital Channel 23	BKR FAIL 1 RETRIP
Digital Channel 24	AR CLOSE BKR 1
Digital Channel 25	AR DISABLED
Digital Channel 26	OPEN POLE OP A
Digital Channel 27	OPEN POLE OP B
Digital Channel 28	OPEN POLE OP C
Digital Channel 29	OPEN POLE OP
Digital Channel 30	LED ECHO On (VO15)
Digital Channel 31	NEG SEQ DIR OC1 FWD
Digital Channel 32	NEG SEQ DIR OC1 REV
Digital Channel 33	TRIP OUTPUT OP
Digital Channel 34	TRIP PHASE A
Digital Channel 35	TRIP PHASE B
Digital Channel 36	TRIP PHASE C
Digital Channel 38	SRC1 VT FUSE FAIL OP
Digital Channel 39	Rx. 85A2 On(W7c)
Digital Channel 40	Emision 85A On (VO24)
Analog Channel 1	SRC1 Ia RMS
Analog Channel 2	SRC1 Ib RMS
Analog Channel 3	SRC1 Ic RMS
Analog Channel 4	SRC1 In RMS
Analog Channel 5	SRC1 Vag RMS
Analog Channel 6	SRC1 Vbg RMS
Analog Channel 7	SRC1 Vcg RMS
Analog Channel 8	SRC1 Frequency
Analog Channel 9	SRC1 V_0 Mag
Analog Channel 10	SRC1 I_0 Mag
Analog Channel 11	SRC1 V_2 Mag
Analog Channel 12	SRC1 I_2 Mag
Analog Channel 13	SRC1 V_1 Mag
Analog Channel 14	SRC1 I_1 Mag
Analog Channel 15	SRC2 Vx RMS
Analog Channel 16	Tracking Frequency

DATA LOGGER

Data Logger Mode	Continuous
Data Logger Trigger	OFF
Rate	60000 msec

USER-PROGRAMMABLE LEDS

USER PROGRAMMABLE LEDS

LED 1: OPERAND	LED Z1 Op. On (VO9)
LED 1: TYPE	Latched
LED 2: OPERAND	LED Z1B Op. On (VO10)
LED 2: TYPE	Latched
LED 3: OPERAND	LED Z2 Op. On (VO11)
LED 3: TYPE	Latched
LED 4: OPERAND	LED Z3 Op. On (VO12)
LED 4: TYPE	Latched
LED 5: OPERAND	LED Z4 Op. On (VO13)
LED 5: TYPE	Latched
LED 6: OPERAND	LINE PICKUP OP
LED 6: TYPE	Latched

URS A10 DESPUЙS DE CAMBIO DE AJUSTES 27.03.2015.URS
C:\USERS\MMISSENE\DESKTOP\MMM\ACTUALIZACIУN CRAPS\TINGU\A10
DEVICE DEFINITION
FILES
ORDER CODE: D60-K03-HCH-F8L-H6U-M6U-P6U-U6U-W6T
VERSION: 5.7X
UR SERIAL NUMBER: AE5C09000045
SETTINGS SEND TO RELAY: SATURDAY, FEBRUARY 07, 2015 09:58:17
DESCRIPTION: (NONE)
TEXT COLOR

USER PROGRAMMABLE LEDS (continued from last page)

LED 7: OPERAND	LED 67N On (VO16)
LED 7: TYPE	Latched
LED 8: OPERAND	LED 51-51N On (VO14)
LED 8: TYPE	Latched
LED 9: OPERAND	BKR FAIL 1 T1 OP
LED 9: TYPE	Latched
LED 10: OPERAND	POWER SWING BLOCK
LED 10: TYPE	Latched
LED 11: OPERAND	LED ECHO On (VO15)
LED 11: TYPE	Latched
LED 12: OPERAND	52A10 Abiert On(M7a)
LED 12: TYPE	Self-Reset
LED 13: OPERAND	Rx. 85A1 On(U8a)
LED 13: TYPE	Latched
LED 14: OPERAND	Rx. 85A2 On(W7c)
LED 14: TYPE	Latched
LED 15: OPERAND	HYBRID POTT TX1
LED 15: TYPE	Latched
LED 16: OPERAND	Tx. 85D On (VO22)
LED 16: TYPE	Latched
LED 17: OPERAND	Blq.21Z1 21N On (VO2)
LED 17: TYPE	Self-Reset
LED 18: OPERAND	Start 50BF On (VO4)
LED 18: TYPE	Latched
LED 19: OPERAND	AR CLOSE BKR 1
LED 19: TYPE	Latched
LED 20: OPERAND	Bloq. 79 On (VO6)
LED 20: TYPE	Self-Reset
LED 21: OPERAND	P.Cort. Abie On(M8a)
LED 21: TYPE	Self-Reset
LED 22: OPERAND	DNP INC PCOR On (VO61)
LED 22: TYPE	Self-Reset

USER-PROGRAMMABLE SELF TESTS

Remote Device Off Function	Enabled
Battery Fail Function	Enabled
SNTP Fail Function	Enabled
IRIG B Fail Function	Enabled

USER-DEFINABLE DISPLAYS

USER DISPLAY 1: Top Line	LIN PTA CORTES 2 A10
USER DISPLAY 1: Bottom Line	SISTEMA 2
USER DISPLAY 1: Item 1	0
USER DISPLAY 1: Item 2	0
USER DISPLAY 1: Item 3	0
USER DISPLAY 1: Item 4	0
USER DISPLAY 1: Item 5	0
USER DISPLAY 2: Top Line	POTENCIA ACTIVA
USER DISPLAY 2: Bottom Line	~1
USER DISPLAY 2: Item 1	7168
USER DISPLAY 2: Item 2	0
USER DISPLAY 2: Item 3	0
USER DISPLAY 2: Item 4	0
USER DISPLAY 2: Item 5	0
USER DISPLAY 3: Top Line	POTENCIA REACTIVA
USER DISPLAY 3: Bottom Line	~1
USER DISPLAY 3: Item 1	7176
USER DISPLAY 3: Item 2	0
USER DISPLAY 3: Item 3	0
USER DISPLAY 3: Item 4	0
USER DISPLAY 3: Item 5	0
USER DISPLAY 4: Top Line	CORRIENTE FASE A
USER DISPLAY 4: Bottom Line	~1
USER DISPLAY 4: Item 1	6144
USER DISPLAY 4: Item 2	0

URS A10 DESPUÏS DE CAMBIO DE AJUSTES 27.03.2015.URS
C:\USERS\MMISSENE\DESKTOP\MMM\ACTUALIZACIУN CRAPS\TINGU\A10
DEVICE DEFINITION
FILES
ORDER CODE: D60-K03-HCH-F8L-H6U-M6U-P6U-U6U-W6T
VERSION: 5.7X
UR SERIAL NUMBER: AE5C09000045
SETTINGS SEND TO RELAY: SATURDAY, FEBRUARY 07, 2015 09:58:17
DESCRIPTION: (NONE)
TEXT COLOR

USER-DEFINABLE DISPLAYS (continued from last page)

USER DISPLAY 4: Item 3	0
USER DISPLAY 4: Item 4	0
USER DISPLAY 4: Item 5	0
USER DISPLAY 5: Top Line	CORRIENTE FASE B
USER DISPLAY 5: Bottom Line	~1
USER DISPLAY 5: Item 1	6146
USER DISPLAY 5: Item 2	0
USER DISPLAY 5: Item 3	0
USER DISPLAY 5: Item 4	0
USER DISPLAY 5: Item 5	0
USER DISPLAY 6: Top Line	CORRIENTE FASE C
USER DISPLAY 6: Bottom Line	~1
USER DISPLAY 6: Item 1	6148
USER DISPLAY 6: Item 2	0
USER DISPLAY 6: Item 3	0
USER DISPLAY 6: Item 4	0
USER DISPLAY 6: Item 5	0
USER DISPLAY 7: Top Line	TENSION VAB
USER DISPLAY 7: Bottom Line	~1
USER DISPLAY 7: Item 1	6671
USER DISPLAY 7: Item 2	0
USER DISPLAY 7: Item 3	0
USER DISPLAY 7: Item 4	0
USER DISPLAY 7: Item 5	0
USER DISPLAY 8: Top Line	TENSION VBC
USER DISPLAY 8: Bottom Line	~1
USER DISPLAY 8: Item 1	6673
USER DISPLAY 8: Item 2	0
USER DISPLAY 8: Item 3	0
USER DISPLAY 8: Item 4	0
USER DISPLAY 8: Item 5	0
USER DISPLAY 9: Top Line	TENSION VCA
USER DISPLAY 9: Bottom Line	~1
USER DISPLAY 9: Item 1	6675
USER DISPLAY 9: Item 2	0
USER DISPLAY 9: Item 3	0
USER DISPLAY 9: Item 4	0
USER DISPLAY 9: Item 5	0
USER DISPLAY 10: Top Line	DISTANCIA DE FALLA
USER DISPLAY 10: Bottom Line	~1 ~2
USER DISPLAY 10: Item 1	9061
USER DISPLAY 10: Item 2	37382
USER DISPLAY 10: Item 3	0
USER DISPLAY 10: Item 4	0
USER DISPLAY 10: Item 5	0
Invoke and Scroll	OFF

INSTALLATION

Relay Name	52A10_D60

SYSTEM SETUP

AC INPUTS

CURRENT

CT F1: Phase CT Primary	1000 A
CT F1: Phase CT Secondary	1 A
CT F1: Ground CT Primary	1000 A
CT F1: Ground CT Secondary	1 A

VOLTAGE

VT F5: Phase VT Connection	Wye
VT F5: Phase VT Secondary	66.4 V
VT F5: Phase VT Ratio	1339.13 :1
VT F5: Auxiliary VT Connection	Vbg
VT F5: Auxiliary VT Secondary	66.4 V
VT F5: Auxiliary VT Ratio	1339.13 :1

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DESCRIPTION: (NONE)
TEXT COLOR

POWER SYSTEM

Nominal Frequency	50 Hz
Phase Rotation	ABC
Frequency And Phase Reference	SRC 1 (SRC 1)
Frequency Tracking Function	Enabled

SIGNAL SOURCES

SOURCE 1: Name	SRC 1
SOURCE 1: Phase CT	F1
SOURCE 1: Ground CT	F1
SOURCE 1: Phase VT	F5
SOURCE 1: Auxiliary VT	None
SOURCE 2: Name	SRC 2
SOURCE 2: Phase CT	None
SOURCE 2: Ground CT	None
SOURCE 2: Phase VT	None
SOURCE 2: Auxiliary VT	F5

BREAKERS

Breaker 1 Function	Enabled
Breaker 1 Push Button Control	Disabled
Breaker 1 Name	52A10
Breaker 1 Mode	1-Pole
Breaker 1 Open	OFF
Breaker 1 Block Open	OFF
Breaker 1 Close	OFF
Breaker 1 Block Close	OFF
Breaker 1 Phase A/3-Pole Closed	Polo 1 cerr On(H7c)
Breaker 1 Phase A/3-Pole Opened	52A10 Abiert On(M7a)
Breaker 1 Phase B Closed	Polo 2 cerr On(H8a)
Breaker 1 Phase B Opened	OFF
Breaker 1 Phase C Closed	Polo 3 cerr On(H8c)
Breaker 1 Phase C Opened	OFF
Breaker 1 Toperate	0.070 s
Breaker 1 External Alarm	OFF
Breaker 1 Alarm Delay	0.000 s
Breaker 1 Manual Close Recal Time	0.000 s
Breaker 1 Out Of Service	OFF
Breaker 1 Events	Disabled

FLEXLOGIC

FLEXLOGIC EQUATION EDITOR

FlexLogic Entry 1	AR CLOSE BKR 1
FlexLogic Entry 2	POSITIVE ONE SHOT
FlexLogic Entry 3	BKR FAIL 1 T1 OP
FlexLogic Entry 4	POSITIVE ONE SHOT
FlexLogic Entry 5	POWER SWING BLOCK
FlexLogic Entry 6	POSITIVE ONE SHOT
FlexLogic Entry 7	TRIP OUTPUT OP
FlexLogic Entry 8	POSITIVE ONE SHOT
FlexLogic Entry 9	OR(4)
FlexLogic Entry 10	= Osc Trigger (VO64)
FlexLogic Entry 11	LINE PICKUP OP
FlexLogic Entry 12	PHASE TOC1 OP
FlexLogic Entry 13	PH DIST Z1 OP
FlexLogic Entry 14	PH DIST Z3 OP
FlexLogic Entry 15	PH DIST Z4 OP
FlexLogic Entry 16	PH DIST Z5 OP
FlexLogic Entry 17	GND DIST Z3 OP
FlexLogic Entry 18	GND DIST Z4 OP
FlexLogic Entry 19	GND DIST Z5 OP
FlexLogic Entry 20	NEUTRAL TOC1 OP
FlexLogic Entry 21	NEUTRAL TOC2 OP
FlexLogic Entry 22	HYBRID POTT OP
FlexLogic Entry 23	Trip 85D On (VO5)

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SETTINGS SEND TO RELAY: SATURDAY, FEBRUARY 07, 2015 09:58:17
DESCRIPTION: (NONE)
TEXT COLOR

FLEXLOGIC EQUATION EDITOR (continued from last page)

FlexLogic Entry 24	OR(13)
FlexLogic Entry 25	= Trip 3p (VO1)
FlexLogic Entry 26	SRC1 VT FUSE FAIL OP
FlexLogic Entry 27	Falla TP Lin On(U7a)
FlexLogic Entry 28	OR(2)
FlexLogic Entry 29	= Blq.21Z1 21N (VO2)
FlexLogic Entry 30	Blq.21Z1 21N On (VO2)
FlexLogic Entry 31	POWER SWING BLOCK
FlexLogic Entry 32	OR(2)
FlexLogic Entry 33	= Blq.21Z2-Z5 (VO3)
FlexLogic Entry 34	TRIP OUTPUT OP
FlexLogic Entry 35	Op. 86B On(P8c)
FlexLogic Entry 36	Trip 85D On (VO5)
FlexLogic Entry 37	Start BF 87B On(W7a)
FlexLogic Entry 38	OR(4)
FlexLogic Entry 39	= Start 50BF (VO4)
FlexLogic Entry 40	P.Cort. Abie On(M8a)
FlexLogic Entry 41	NOT
FlexLogic Entry 42	P.Cort. Cerr On(M8c)
FlexLogic Entry 43	Rx. 85D On(U8c)
FlexLogic Entry 44	AND(3)
FlexLogic Entry 45	= Trip 85D (VO5)
FlexLogic Entry 46	52 apto On(H7a)
FlexLogic Entry 47	NOT
FlexLogic Entry 48	Hab. Reconex On(W5a)
FlexLogic Entry 49	NOT
FlexLogic Entry 50	Rec. en prog On(P7a)
FlexLogic Entry 51	Bloq. 79 p43 On(P7c)
FlexLogic Entry 52	Op. 86B On(P8c)
FlexLogic Entry 53	OR(5)
FlexLogic Entry 54	= Bloq. 79 (VO6)
FlexLogic Entry 55	OPEN POLE OP A
FlexLogic Entry 56	OPEN POLE OP B
FlexLogic Entry 57	OPEN POLE OP C
FlexLogic Entry 58	AND(3)
FlexLogic Entry 59	= Open 3p (VO7)
FlexLogic Entry 60	SRC1 VT FUSE FAIL OP
FlexLogic Entry 61	Falla TP Lin On(U7a)
FlexLogic Entry 62	OR(2)
FlexLogic Entry 63	NOT
FlexLogic Entry 64	= VT ok (VO8)
FlexLogic Entry 65	PH DIST Z1 OP
FlexLogic Entry 66	GND DIST Z1 OP
FlexLogic Entry 67	OR(2)
FlexLogic Entry 68	= LED Z1 Op. (VO9)
FlexLogic Entry 69	PH DIST Z2 OP
FlexLogic Entry 70	GND DIST Z2 OP
FlexLogic Entry 71	OR(2)
FlexLogic Entry 72	= LED Z1B Op. (VO10)
FlexLogic Entry 73	PH DIST Z3 OP
FlexLogic Entry 74	GND DIST Z3 OP
FlexLogic Entry 75	OR(2)
FlexLogic Entry 76	= LED Z2 Op. (VO11)
FlexLogic Entry 77	PH DIST Z4 OP
FlexLogic Entry 78	GND DIST Z4 OP
FlexLogic Entry 79	OR(2)
FlexLogic Entry 80	= LED Z3 Op. (VO12)
FlexLogic Entry 81	PH DIST Z5 OP
FlexLogic Entry 82	GND DIST Z5 OP
FlexLogic Entry 83	OR(2)
FlexLogic Entry 84	= LED Z4 Op. (VO13)
FlexLogic Entry 85	PHASE TOC1 OP
FlexLogic Entry 86	NEUTRAL TOC1 OP
FlexLogic Entry 87	OR(2)
FlexLogic Entry 88	= LED 51-51N (VO14)

URS A10 DESPUÏS DE CAMBIO DE AJUSTES 27.03.2015.URS
C:\USERS\MMISSENE\DESKTOP\MMM\ACTUALIZACIУN CRAPS\TINGU\A10
DEVICE DEFINITION
FILES
ORDER CODE: D60-K03-HCH-F8L-H6U-M6U-P6U-U6U-W6T
VERSION: 5.7X
UR SERIAL NUMBER: AE5C09000045
SETTINGS SEND TO RELAY: SATURDAY, FEBRUARY 07, 2015 09:58:17
DESCRIPTION: (NONE)
TEXT COLOR

FLEXLOGIC EQUATION EDITOR (continued from last page)

FlexLogic Entry 89	Rx. 85A2 On(W7c)
FlexLogic Entry 90	Rx. 85A1 On(U8a)
FlexLogic Entry 91	AND(2)
FlexLogic Entry 92	Open 3p On (VO7)
FlexLogic Entry 93	HYBRID POTT TX1
FlexLogic Entry 94	AND(3)
FlexLogic Entry 95	= LED ECHO (VO15)
FlexLogic Entry 96	NEUTRAL TOC2 OP
FlexLogic Entry 97	VT ok On (VO8)
FlexLogic Entry 98	AND(2)
FlexLogic Entry 99	= LED 67N (VO16)
FlexLogic Entry 100	PH DIST Z1 OP
FlexLogic Entry 101	HYBRID POTT OP
FlexLogic Entry 102	GND DIST Z1 OP
FlexLogic Entry 103	OR(3)
FlexLogic Entry 104	= AR 3P START (VO17)
FlexLogic Entry 105	Rx. 85A1 On(U8a)
FlexLogic Entry 106	Rx. 85A2 On(W7c)
FlexLogic Entry 107	AND(2)
FlexLogic Entry 108	= RX. 85A (VO21)
FlexLogic Entry 109	P.Cort. Abie On(M8a)
FlexLogic Entry 110	NOT
FlexLogic Entry 111	P.Cort. Cerr On(M8c)
FlexLogic Entry 112	BKR FAIL 1 T1 OP
FlexLogic Entry 113	AND(3)
FlexLogic Entry 114	= Tx. 85D (VO22)
FlexLogic Entry 115	DNP INC PCOR On (VO61)
FlexLogic Entry 116	P.Cort. Abie On(M8a)
FlexLogic Entry 117	OR(2)
FlexLogic Entry 118	= BLOCK HYBRID (VO23)
FlexLogic Entry 119	AR DISABLED
FlexLogic Entry 120	= DNP 79 BLOQ (VO30)
FlexLogic Entry 121	AR ENABLED
FlexLogic Entry 122	= DNP 79 ON (VO31)
FlexLogic Entry 123	Falla TP Lin On(U7a)
FlexLogic Entry 124	= DNP TP LINEA (VO32)
FlexLogic Entry 125	Falla TP Bar On(U7c)
FlexLogic Entry 126	= DNP TP BARRA (VO33)
FlexLogic Entry 127	Rx. 85A1 On(U8a)
FlexLogic Entry 128	= DNP RX RAN (VO34)
FlexLogic Entry 129	HYBRID POTT TX1
FlexLogic Entry 130	= DNP TX 85A (VO35)
FlexLogic Entry 131	Rx. 85A2 On(W7c)
FlexLogic Entry 132	= DNP RX JAH (VO36)
FlexLogic Entry 133	Rx. 85A1 On(U8a)
FlexLogic Entry 134	Rx. 85A2 On(W7c)
FlexLogic Entry 135	AND(2)
FlexLogic Entry 136	Open 3p On (VO7)
FlexLogic Entry 137	HYBRID POTT TX1
FlexLogic Entry 138	AND(3)
FlexLogic Entry 139	= DNP ECHO (VO37)
FlexLogic Entry 140	AR CLOSE BKR 1
FlexLogic Entry 141	= DNP 79 CLOSE (VO38)
FlexLogic Entry 142	PH DIST Z1 OP
FlexLogic Entry 143	PH DIST Z2 OP
FlexLogic Entry 144	PH DIST Z3 OP
FlexLogic Entry 145	PH DIST Z4 OP
FlexLogic Entry 146	GND DIST Z1 OP
FlexLogic Entry 147	GND DIST Z2 OP
FlexLogic Entry 148	GND DIST Z3 OP
FlexLogic Entry 149	GND DIST Z4 OP
FlexLogic Entry 150	OR(8)
FlexLogic Entry 151	= DNP 21/21N (VO39)
FlexLogic Entry 152	NEUTRAL TOC2 OP
FlexLogic Entry 153	= DNP 67N (VO40)

URS A10 DESPUÏS DE CAMBIO DE AJUSTES 27.03.2015.URS
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DEVICE DEFINITION
FILES
ORDER CODE: D60-K03-HCH-F8L-H6U-M6U-P6U-U6U-W6T
VERSION: 5.7X
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SETTINGS SEND TO RELAY: SATURDAY, FEBRUARY 07, 2015 09:58:17
DESCRIPTION: (NONE)
TEXT COLOR

FLEXLOGIC EQUATION EDITOR (continued from last page)

FlexLogic Entry 154	BKR FAIL 1 T1 OP
FlexLogic Entry 155	= DNP 50BF (VO41)
FlexLogic Entry 156	PH DIST Z2 OP
FlexLogic Entry 157	GND DIST Z2 OP
FlexLogic Entry 158	OR(2)
FlexLogic Entry 159	= DNP Z1B (VO42)
FlexLogic Entry 160	PH DIST Z1 OP
FlexLogic Entry 161	GND DIST Z1 OP
FlexLogic Entry 162	OR(2)
FlexLogic Entry 163	= DNP Z1 (VO43)
FlexLogic Entry 164	PH DIST Z3 OP
FlexLogic Entry 165	GND DIST Z3 OP
FlexLogic Entry 166	OR(2)
FlexLogic Entry 167	= DNP Z2 (VO44)
FlexLogic Entry 168	PH DIST Z4 OP
FlexLogic Entry 169	GND DIST Z4 OP
FlexLogic Entry 170	OR(2)
FlexLogic Entry 171	= DNP Z3 (VO45)
FlexLogic Entry 172	PH DIST Z5 OP
FlexLogic Entry 173	GND DIST Z5 OP
FlexLogic Entry 174	OR(2)
FlexLogic Entry 175	= DNP Z4 (VO46)
FlexLogic Entry 176	PHASE TOC1 OP
FlexLogic Entry 177	NEUTRAL TOC1 OP
FlexLogic Entry 178	OR(2)
FlexLogic Entry 179	= DNP 51/51N (VO47)
FlexLogic Entry 180	TRIP PHASE A
FlexLogic Entry 181	= DNP TRIP A (VO48)
FlexLogic Entry 182	TRIP PHASE B
FlexLogic Entry 183	= DNP TRIP B (VO49)
FlexLogic Entry 184	TRIP PHASE C
FlexLogic Entry 185	= DNP TRIP C (VO50)
FlexLogic Entry 186	NEUTRAL TOC1 OP
FlexLogic Entry 187	NEUTRAL TOC2 OP
FlexLogic Entry 188	GND DIST Z1 OP
FlexLogic Entry 189	GND DIST Z2 OP
FlexLogic Entry 190	GND DIST Z3 OP
FlexLogic Entry 191	GND DIST Z4 OP
FlexLogic Entry 192	OR(6)
FlexLogic Entry 193	= DNP TRIP GND (VO51)
FlexLogic Entry 194	Trip polo 1 On(W5c)
FlexLogic Entry 195	Trip polo 2 On(W6a)
FlexLogic Entry 196	Trip polo 3 On(W6c)
FlexLogic Entry 197	OR(3)
FlexLogic Entry 198	= DNP TRIP S1 (VO52)
FlexLogic Entry 199	LED PICKUP
FlexLogic Entry 200	= DNP PICKUP (VO53)
FlexLogic Entry 201	SRC1 VT FUSE FAIL OP
FlexLogic Entry 202	Falla TP Lin On(U7a)
FlexLogic Entry 203	OR(2)
FlexLogic Entry 204	= DNP MOD EMER (VO54)
FlexLogic Entry 205	LINE PICKUP OP
FlexLogic Entry 206	= DNP SOTF (VO55)
FlexLogic Entry 207	SRC1 VT FUSE FAIL OP
FlexLogic Entry 208	= DNP VT FAIL (VO56)
FlexLogic Entry 209	POWER SWING BLOCK
FlexLogic Entry 210	= DNP PSWING (VO57)
FlexLogic Entry 211	52 apto On(H7a)
FlexLogic Entry 212	NOT
FlexLogic Entry 213	Hab. Reconex On(W5a)
FlexLogic Entry 214	NOT
FlexLogic Entry 215	Rec. en prog On(P7a)
FlexLogic Entry 216	Bloq. 79 p43 On(P7c)
FlexLogic Entry 217	Op. 86B On(P8c)
FlexLogic Entry 218	OR(5)

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C:\USERS\MMISSENE\DESKTOP\MMM\ACTUALIZACIУN CRAPS\TINGU\A10
DEVICE DEFINITION
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ORDER CODE: D60-K03-HCH-F8L-H6U-M6U-P6U-U6U-W6T
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SETTINGS SEND TO RELAY: SATURDAY, FEBRUARY 07, 2015 09:58:17
DESCRIPTION: (NONE)
TEXT COLOR

FLEXLOGIC EQUATION EDITOR (continued from last page)

FlexLogic Entry 219	= DNP 79BLQ EX (VO58)
FlexLogic Entry 220	Rx. 85D On(U8c)
FlexLogic Entry 221	= DNP RX85D (VO59)
FlexLogic Entry 222	BKR FAIL 1 T1 OP
FlexLogic Entry 223	= DNP TX85D (VO60)
FlexLogic Entry 224	P.Cort. Abie On(M8a)
FlexLogic Entry 225	P.Cort. Cerr On(M8c)
FlexLogic Entry 226	AND(2)
FlexLogic Entry 227	P.Cort. Abie Off(M8a)
FlexLogic Entry 228	P.Cort. Cerr Off(M8c)
FlexLogic Entry 229	AND(2)
FlexLogic Entry 230	OR(2)
FlexLogic Entry 231	= DNP INC PCOR (VO61)
FlexLogic Entry 232	HYBRID POTT TX1
FlexLogic Entry 233	TIMER 1
FlexLogic Entry 234	= Emision 85A (VO24)
FlexLogic Entry 235	GND DIST Z5 OP
FlexLogic Entry 236	PH DIST Z5 OP
FlexLogic Entry 237	OR(2)
FlexLogic Entry 238	TIMER 2
FlexLogic Entry 239	= Z5 EDAG (VO65)
FlexLogic Entry 240	PH DIST Z3 PKP
FlexLogic Entry 241	= PKP Z3 (VO66)
FlexLogic Entry 242	RX. 85A On (VO21)
FlexLogic Entry 243	Open 3p On (VO7)
FlexLogic Entry 244	AND(2)
FlexLogic Entry 245	= ECHO TX (VO67)
FlexLogic Entry 246	END

FLEXLOGIC TIMERS

Timer 1: Type	millisecond
Timer 1: Pickup Delay	0
Timer 1: Dropout Delay	100
Timer 2: Type	second
Timer 2: Pickup Delay	0
Timer 2: Dropout Delay	1

GROUPED ELEMENTS

GROUP 1

LINE PICKUP [GROUP 1]

Function	Enabled
Signal Source	SRC 1 (SRC 1)
Phase IOC Line Pickup	0.800 pu
UV Pickup	0.800 pu
Line End Open Pickup Delay	0.200 s
Line End Open Reset Delay	0.200 s
OV Pickup Delay	0.200 s
Autoreclose Coordination Bypass	Enabled
Autoreclose Coordination Pickup Delay	0.045 s
Autoreclose Coordination Reset Delay	0.005 s
Terminal Open	BREAKER 1 OPEN
AR Accelerate	OFF
Distance Trip	Enabled
Block	OFF
Target	Self-reset
Events	Enabled

DISTANCE

DISTANCE [GROUP 1]

Source	SRC 1 (SRC 1)
Memory Duration	10 cycles
Force Self-Polar	OFF
Force Mem-Polar	OFF

PHASE DISTANCE [GROUP 1]

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FILES
ORDER CODE: D60-K03-HCH-F8L-H6U-M6U-P6U-U6U-W6T
VERSION: 5.7X
UR SERIAL NUMBER: AE5C09000045
SETTINGS SEND TO RELAY: SATURDAY, FEBRUARY 07, 2015 09:58:17
DESCRIPTION: (NONE)
TEXT COLOR

PHASE DISTANCE [GROUP 1] (continued from last page)

PHASE DISTANCE Z1: Function	Enabled
PHASE DISTANCE Z1: Direction	Forward
PHASE DISTANCE Z1: Shape	Quad
PHASE DISTANCE Z1: Xfmr Vol Connection	None
PHASE DISTANCE Z1: Xfmr Curr Connection	None
PHASE DISTANCE Z1: Reach	19.49 ohms
PHASE DISTANCE Z1: RCA	90 deg
PHASE DISTANCE Z1: Rev Reach	0.02 ohms
PHASE DISTANCE Z1: Rev Reach RCA	77 deg
PHASE DISTANCE Z1: Comp Limit	90 deg
PHASE DISTANCE Z1: DIR RCA	49 deg
PHASE DISTANCE Z1: DIR Comp Limit	71 deg
PHASE DISTANCE Z1: Quad Right Blinder	19.49 ohms
PHASE DISTANCE Z1: Quad Right Blinder RCA	77 deg
PHASE DISTANCE Z1: Quad Left Blinder	19.49 ohms
PHASE DISTANCE Z1: Quad Left Blinder RCA	77 deg
PHASE DISTANCE Z1: Supervision	0.100 pu
PHASE DISTANCE Z1: Volt Level	0.000 pu
PHASE DISTANCE Z1: Delay	0.000 s
PHASE DISTANCE Z1: Block	Blq.21Z1 21N On (VO2)
PHASE DISTANCE Z1: Target	Self-reset
PHASE DISTANCE Z1: Events	Enabled
PHASE DISTANCE Z2: Function	Enabled
PHASE DISTANCE Z2: Direction	Forward
PHASE DISTANCE Z2: Shape	Quad
PHASE DISTANCE Z2: Xfmr Vol Connection	None
PHASE DISTANCE Z2: Xfmr Curr Connection	None
PHASE DISTANCE Z2: Reach	68.18 ohms
PHASE DISTANCE Z2: RCA	90 deg
PHASE DISTANCE Z2: Rev Reach	0.02 ohms
PHASE DISTANCE Z2: Rev Reach RCA	77 deg
PHASE DISTANCE Z2: Comp Limit	90 deg
PHASE DISTANCE Z2: DIR RCA	49 deg
PHASE DISTANCE Z2: DIR Comp Limit	71 deg
PHASE DISTANCE Z2: Quad Right Blinder	68.18 ohms
PHASE DISTANCE Z2: Quad Right Blinder RCA	77 deg
PHASE DISTANCE Z2: Quad Left Blinder	68.18 ohms
PHASE DISTANCE Z2: Quad Left Blinder RCA	77 deg
PHASE DISTANCE Z2: Supervision	0.100 pu
PHASE DISTANCE Z2: Volt Level	0.000 pu
PHASE DISTANCE Z2: Delay	65.000 s
PHASE DISTANCE Z2: Block	Blq.21Z2-Z5 On (VO3)
PHASE DISTANCE Z2: Target	Self-reset
PHASE DISTANCE Z2: Events	Enabled
PHASE DISTANCE Z3: Function	Enabled
PHASE DISTANCE Z3: Direction	Forward
PHASE DISTANCE Z3: Shape	Quad
PHASE DISTANCE Z3: Xfmr Vol Connection	None
PHASE DISTANCE Z3: Xfmr Curr Connection	None
PHASE DISTANCE Z3: Reach	34.79 ohms
PHASE DISTANCE Z3: RCA	90 deg
PHASE DISTANCE Z3: Rev Reach	0.02 ohms
PHASE DISTANCE Z3: Rev Reach RCA	77 deg
PHASE DISTANCE Z3: Comp Limit	90 deg
PHASE DISTANCE Z3: DIR RCA	49 deg
PHASE DISTANCE Z3: DIR Comp Limit	71 deg
PHASE DISTANCE Z3: Quad Right Blinder	34.79 ohms
PHASE DISTANCE Z3: Quad Right Blinder RCA	77 deg
PHASE DISTANCE Z3: Quad Left Blinder	34.79 ohms
PHASE DISTANCE Z3: Quad Left Blinder RCA	77 deg
PHASE DISTANCE Z3: Supervision	0.100 pu
PHASE DISTANCE Z3: Volt Level	0.000 pu
PHASE DISTANCE Z3: Delay	0.600 s
PHASE DISTANCE Z3: Block	Blq.21Z2-Z5 On (VO3)
PHASE DISTANCE Z3: Target	Self-reset

URS A10 DESPUÏS DE CAMBIO DE AJUSTES 27.03.2015.URS
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DEVICE DEFINITION
FILES
ORDER CODE: D60-K03-HCH-F8L-H6U-M6U-P6U-U6U-W6T
VERSION: 5.7X
UR SERIAL NUMBER: AE5C09000045
SETTINGS SEND TO RELAY: SATURDAY, FEBRUARY 07, 2015 09:58:17
DESCRIPTION: (NONE)
TEXT COLOR

PHASE DISTANCE [GROUP 1] (continued from last page)

PHASE DISTANCE Z3: Events	Enabled
PHASE DISTANCE Z4: Function	Enabled
PHASE DISTANCE Z4: Direction	Reverse
PHASE DISTANCE Z4: Shape	Quad
PHASE DISTANCE Z4: Xfmr Vol Connection	None
PHASE DISTANCE Z4: Xfmr Curr Connection	None
PHASE DISTANCE Z4: Reach	67.75 ohms
PHASE DISTANCE Z4: RCA	90 deg
PHASE DISTANCE Z4: Rev Reach	0.02 ohms
PHASE DISTANCE Z4: Rev Reach RCA	77 deg
PHASE DISTANCE Z4: Comp Limit	90 deg
PHASE DISTANCE Z4: DIR RCA	49 deg
PHASE DISTANCE Z4: DIR Comp Limit	71 deg
PHASE DISTANCE Z4: Quad Right Blinder	67.75 ohms
PHASE DISTANCE Z4: Quad Right Blinder RCA	77 deg
PHASE DISTANCE Z4: Quad Left Blinder	67.75 ohms
PHASE DISTANCE Z4: Quad Left Blinder RCA	77 deg
PHASE DISTANCE Z4: Supervision	0.100 pu
PHASE DISTANCE Z4: Volt Level	0.000 pu
PHASE DISTANCE Z4: Delay	2.500 s
PHASE DISTANCE Z4: Block	Blq.21Z2-Z5 On (VO3)
PHASE DISTANCE Z4: Target	Self-reset
PHASE DISTANCE Z4: Events	Enabled
PHASE DISTANCE Z5: Function	Enabled
PHASE DISTANCE Z5: Direction	Forward
PHASE DISTANCE Z5: Shape	Quad
PHASE DISTANCE Z5: Xfmr Vol Connection	None
PHASE DISTANCE Z5: Xfmr Curr Connection	None
PHASE DISTANCE Z5: Reach	66.95 ohms
PHASE DISTANCE Z5: RCA	90 deg
PHASE DISTANCE Z5: Rev Reach	0.02 ohms
PHASE DISTANCE Z5: Rev Reach RCA	77 deg
PHASE DISTANCE Z5: Comp Limit	90 deg
PHASE DISTANCE Z5: DIR RCA	49 deg
PHASE DISTANCE Z5: DIR Comp Limit	71 deg
PHASE DISTANCE Z5: Quad Right Blinder	66.95 ohms
PHASE DISTANCE Z5: Quad Right Blinder RCA	77 deg
PHASE DISTANCE Z5: Quad Left Blinder	66.95 ohms
PHASE DISTANCE Z5: Quad Left Blinder RCA	77 deg
PHASE DISTANCE Z5: Supervision	0.100 pu
PHASE DISTANCE Z5: Volt Level	0.000 pu
PHASE DISTANCE Z5: Delay	1.500 s
PHASE DISTANCE Z5: Block	Blq.21Z2-Z5 On (VO3)
PHASE DISTANCE Z5: Target	Self-reset
PHASE DISTANCE Z5: Events	Enabled

GROUND DISTANCE [GROUP 1]

GROUND DISTANCE Z1: Function	Enabled
GROUND DISTANCE Z1: Direction	Forward
GROUND DISTANCE Z1: Shape	Quad
GROUND DISTANCE Z1: Z0/Z1 Mag	3.41
GROUND DISTANCE Z1: Z0/Z1 Ang	3 deg
GROUND DISTANCE Z1: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z1: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z1: Reach	19.49 ohms
GROUND DISTANCE Z1: RCA	90 deg
GROUND DISTANCE Z1: Rev Reach	0.02 ohms
GROUND DISTANCE Z1: Rev Reach RCA	77 deg
GROUND DISTANCE Z1: POL Current	Neg-seq
GROUND DISTANCE Z1: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z1: Comp Limit	90 deg
GROUND DISTANCE Z1: DIR RCA	49 deg
GROUND DISTANCE Z1: DIR Comp Limit	71 deg
GROUND DISTANCE Z1: Quad Right Blinder	19.49 ohms
GROUND DISTANCE Z1: Quad Right Blinder RCA	77 deg

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C:\USERS\MMISSENE\DESKTOP\MMM\ACTUALIZACIУN CRAPS\TINGU\A10
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ORDER CODE: D60-K03-HCH-F8L-H6U-M6U-P6U-U6U-W6T
VERSION: 5.7X
UR SERIAL NUMBER: AE5C09000045
SETTINGS SEND TO RELAY: SATURDAY, FEBRUARY 07, 2015 09:58:17
DESCRIPTION: (NONE)
TEXT COLOR

GROUND DISTANCE [GROUP 1] (continued from last page)

GROUND DISTANCE Z1: Quad Left Blinder	19.49 ohms
GROUND DISTANCE Z1: Quad Left Blinder RCA	77 deg
GROUND DISTANCE Z1: Supervision	0.100 pu
GROUND DISTANCE Z1: Volt Level	0.000 pu
GROUND DISTANCE Z1: Delay	0.000 s
GROUND DISTANCE Z1: Block	Blq.21Z1 21N On (VO2)
GROUND DISTANCE Z1: Target	Self-reset
GROUND DISTANCE Z1: Events	Enabled
GROUND DISTANCE Z2: Function	Enabled
GROUND DISTANCE Z2: Direction	Forward
GROUND DISTANCE Z2: Shape	Quad
GROUND DISTANCE Z2: Z0/Z1 Mag	3.41
GROUND DISTANCE Z2: Z0/Z1 Ang	3 deg
GROUND DISTANCE Z2: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z2: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z2: Reach	68.18 ohms
GROUND DISTANCE Z2: RCA	90 deg
GROUND DISTANCE Z2: Rev Reach	0.02 ohms
GROUND DISTANCE Z2: Rev Reach RCA	77 deg
GROUND DISTANCE Z2: POL Current	Neg-seq
GROUND DISTANCE Z2: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z2: Comp Limit	90 deg
GROUND DISTANCE Z2: DIR RCA	49 deg
GROUND DISTANCE Z2: DIR Comp Limit	71 deg
GROUND DISTANCE Z2: Quad Right Blinder	68.18 ohms
GROUND DISTANCE Z2: Quad Right Blinder RCA	77 deg
GROUND DISTANCE Z2: Quad Left Blinder	68.18 ohms
GROUND DISTANCE Z2: Quad Left Blinder RCA	77 deg
GROUND DISTANCE Z2: Supervision	0.100 pu
GROUND DISTANCE Z2: Volt Level	0.000 pu
GROUND DISTANCE Z2: Delay	65.000 s
GROUND DISTANCE Z2: Block	Blq.21Z1 21N On (VO2)
GROUND DISTANCE Z2: Target	Self-reset
GROUND DISTANCE Z2: Events	Enabled
GROUND DISTANCE Z3: Function	Enabled
GROUND DISTANCE Z3: Direction	Forward
GROUND DISTANCE Z3: Shape	Quad
GROUND DISTANCE Z3: Z0/Z1 Mag	3.41
GROUND DISTANCE Z3: Z0/Z1 Ang	3 deg
GROUND DISTANCE Z3: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z3: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z3: Reach	34.79 ohms
GROUND DISTANCE Z3: RCA	90 deg
GROUND DISTANCE Z3: Rev Reach	0.02 ohms
GROUND DISTANCE Z3: Rev Reach RCA	77 deg
GROUND DISTANCE Z3: POL Current	Neg-seq
GROUND DISTANCE Z3: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z3: Comp Limit	90 deg
GROUND DISTANCE Z3: DIR RCA	49 deg
GROUND DISTANCE Z3: DIR Comp Limit	71 deg
GROUND DISTANCE Z3: Quad Right Blinder	34.79 ohms
GROUND DISTANCE Z3: Quad Right Blinder RCA	77 deg
GROUND DISTANCE Z3: Quad Left Blinder	34.79 ohms
GROUND DISTANCE Z3: Quad Left Blinder RCA	77 deg
GROUND DISTANCE Z3: Supervision	0.100 pu
GROUND DISTANCE Z3: Volt Level	0.000 pu
GROUND DISTANCE Z3: Delay	0.600 s
GROUND DISTANCE Z3: Block	Blq.21Z1 21N On (VO2)
GROUND DISTANCE Z3: Target	Self-reset
GROUND DISTANCE Z3: Events	Enabled
GROUND DISTANCE Z4: Function	Enabled
GROUND DISTANCE Z4: Direction	Reverse
GROUND DISTANCE Z4: Shape	Quad
GROUND DISTANCE Z4: Z0/Z1 Mag	3.41
GROUND DISTANCE Z4: Z0/Z1 Ang	3 deg

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C:\USERS\MMISSENE\DESKTOP\MMM\ACTUALIZACIУN CRAPS\TINGU\A10
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ORDER CODE: D60-K03-HCH-F8L-H6U-M6U-P6U-U6U-W6T
VERSION: 5.7X
UR SERIAL NUMBER: AE5C09000045
SETTINGS SEND TO RELAY: SATURDAY, FEBRUARY 07, 2015 09:58:17
DESCRIPTION: (NONE)
TEXT COLOR

GROUND DISTANCE [GROUP 1] (continued from last page)

GROUND DISTANCE Z4: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z4: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z4: Reach	67.75 ohms
GROUND DISTANCE Z4: RCA	90 deg
GROUND DISTANCE Z4: Rev Reach	0.02 ohms
GROUND DISTANCE Z4: Rev Reach RCA	77 deg
GROUND DISTANCE Z4: POL Current	Neg-seq
GROUND DISTANCE Z4: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z4: Comp Limit	90 deg
GROUND DISTANCE Z4: DIR RCA	49 deg
GROUND DISTANCE Z4: DIR Comp Limit	71 deg
GROUND DISTANCE Z4: Quad Right Blinder	67.75 ohms
GROUND DISTANCE Z4: Quad Right Blinder RCA	77 deg
GROUND DISTANCE Z4: Quad Left Blinder	67.75 ohms
GROUND DISTANCE Z4: Quad Left Blinder RCA	77 deg
GROUND DISTANCE Z4: Supervision	0.100 pu
GROUND DISTANCE Z4: Volt Level	0.000 pu
GROUND DISTANCE Z4: Delay	2.500 s
GROUND DISTANCE Z4: Block	Blq.21Z1 21N On (VO2)
GROUND DISTANCE Z4: Target	Self-reset
GROUND DISTANCE Z4: Events	Enabled
GROUND DISTANCE Z5: Function	Enabled
GROUND DISTANCE Z5: Direction	Forward
GROUND DISTANCE Z5: Shape	Quad
GROUND DISTANCE Z5: Z0/Z1 Mag	3.41
GROUND DISTANCE Z5: Z0/Z1 Ang	3 deg
GROUND DISTANCE Z5: Z0M/Z1 Mag	0.00
GROUND DISTANCE Z5: Z0M/Z1 Ang	0 deg
GROUND DISTANCE Z5: Reach	66.95 ohms
GROUND DISTANCE Z5: RCA	90 deg
GROUND DISTANCE Z5: Rev Reach	0.02 ohms
GROUND DISTANCE Z5: Rev Reach RCA	77 deg
GROUND DISTANCE Z5: POL Current	Neg-seq
GROUND DISTANCE Z5: Non-Homogen Ang	0.0 deg
GROUND DISTANCE Z5: Comp Limit	90 deg
GROUND DISTANCE Z5: DIR RCA	49 deg
GROUND DISTANCE Z5: DIR Comp Limit	71 deg
GROUND DISTANCE Z5: Quad Right Blinder	66.95 ohms
GROUND DISTANCE Z5: Quad Right Blinder RCA	77 deg
GROUND DISTANCE Z5: Quad Left Blinder	66.95 ohms
GROUND DISTANCE Z5: Quad Left Blinder RCA	77 deg
GROUND DISTANCE Z5: Supervision	0.100 pu
GROUND DISTANCE Z5: Volt Level	0.000 pu
GROUND DISTANCE Z5: Delay	1.500 s
GROUND DISTANCE Z5: Block	Blq.21Z1 21N On (VO2)
GROUND DISTANCE Z5: Target	Self-reset
GROUND DISTANCE Z5: Events	Enabled

POWER SWING DETECT [GROUP 1]

Function	Enabled
Source	SRC 1 (SRC 1)
Shape	Quad Shape
Mode	Two Step
Supv	0.200 pu
Fwd Reach	157.25 ohms
Quad Fwd Mid	161.17 ohms
Quad Fwd Out	162.92 ohms
Fwd Rca	77 deg
Rev Reach	122.40 ohms
Quad Rev Mid	126.32 ohms
Quad Rev Out	128.06 ohms
Rev Rca	77 deg
Outer Limit Angle	120 deg
Middle Limit Angle	80 deg
Inner Limit Angle	74 deg

URS A10 DESPUÏS DE CAMBIO DE AJUSTES 27.03.2015.URS
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DEVICE DEFINITION
FILES
ORDER CODE: D60-K03-HCH-F8L-H6U-M6U-P6U-U6U-W6T
VERSION: 5.7X
UR SERIAL NUMBER: AE5C09000045
SETTINGS SEND TO RELAY: SATURDAY, FEBRUARY 07, 2015 09:58:17
DESCRIPTION: (NONE)
TEXT COLOR

POWER SWING DETECT [GROUP 1] (continued from last page)

Outer Rgt Bld	128.06 ohms
Outer Lft Bld	110.64 ohms
Midle Rgt Bld	160.65 ohms
Midle Lft Bld	69.44 ohms
Inner Rgt Bld	122.40 ohms
Inner Lft Bld	104.72 ohms
Delay 1 Pickup	0.002 s
Delay 1 Reset	0.050 s
Delay 2 Pickup	0.017 s
Delay 3 Pickup	0.009 s
Delay 4 Pickup	0.017 s
Seal-In Delay	0.400 s
Trip Mode	Delayed
Block	NEUTRAL TOC1 PKP
Target	Self-reset
Event	Enabled

PHASE CURRENT

PHASE TOC [GROUP 1]

PHASE TOC1: Function	Enabled
PHASE TOC1: Signal Source	SRC 1 (SRC 1)
PHASE TOC1: Input	Phasor
PHASE TOC1: Pickup	0.720 pu
PHASE TOC1: Curve	IEC Curve A
PHASE TOC1: TD Multiplier	0.10
PHASE TOC1: Reset	Instantaneous
PHASE TOC1: Voltage Restraint	Disabled
PHASE TOC1: Block A	VT ok On (VO8)
PHASE TOC1: Block B	VT ok On (VO8)
PHASE TOC1: Block C	VT ok On (VO8)
PHASE TOC1: Target	Self-reset
PHASE TOC1: Events	Enabled

NEUTRAL CURRENT

NEUTRAL TOC [GROUP 1]

NEUTRAL TOC1: Function	Enabled
NEUTRAL TOC1: Source	SRC 1 (SRC 1)
NEUTRAL TOC1: Input	Phasor
NEUTRAL TOC1: Pickup	0.050 pu
NEUTRAL TOC1: Curve	IEC Curve A
NEUTRAL TOC1: TD Multiplier	0.30
NEUTRAL TOC1: Reset	Instantaneous
NEUTRAL TOC1: Block	VT ok On (VO8)
NEUTRAL TOC1: Target	Self-reset
NEUTRAL TOC1: Events	Enabled
NEUTRAL TOC2: Function	Enabled
NEUTRAL TOC2: Source	SRC 1 (SRC 1)
NEUTRAL TOC2: Input	Phasor
NEUTRAL TOC2: Pickup	0.050 pu
NEUTRAL TOC2: Curve	IEC Curve A
NEUTRAL TOC2: TD Multiplier	0.30
NEUTRAL TOC2: Reset	Instantaneous
NEUTRAL TOC2: Block	NEG SEQ DIR OC1 REV
NEUTRAL TOC2: Target	Self-reset
NEUTRAL TOC2: Events	Enabled

NEGATIVE SEQUENCE CURRENT

NEGATIVE SEQUENCE DIRECTIONAL OC [GROUP 1]

NEGATIVE SEQ DIR OC1: Function	Enabled
NEGATIVE SEQ DIR OC1: Source	SRC 1 (SRC 1)
NEGATIVE SEQ DIR OC1: Offset	0.00 ohms
NEGATIVE SEQ DIR OC1: Type	Neg Sequence
NEGATIVE SEQ DIR OC1: POS SEQ Restraint	0.000
NEGATIVE SEQ DIR OC1: Forward ECA	78 ° Lag
NEGATIVE SEQ DIR OC1: Forward Limit Angle	80 deg

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DESCRIPTION: (NONE)
TEXT COLOR

NEGATIVE SEQUENCE DIRECTIONAL OC [GROUP 1] (continued from last page)

NEGATIVE SEQ DIR OC1: Forward Pickup	0.050 pu
NEGATIVE SEQ DIR OC1: Reverse Limit Angle	80 deg
NEGATIVE SEQ DIR OC1: Reverse Pickup	0.015 pu
NEGATIVE SEQ DIR OC1: Block	Blq.21Z1 21N On (VO2)
NEGATIVE SEQ DIR OC1: Target	Self-reset
NEGATIVE SEQ DIR OC1: Events	Enabled

BREAKER FAILURE [GROUP 1]

BF1: Function	Enabled
BF1: Mode	3-Pole
BF1: Source	SRC 1 (SRC 1)
BF1: Current Supervision	Yes
BF1: Use Seal-In	No
BF1: Three Pole Initiate	Start 50BF On (VO4)
BF1: Block	OFF
BF1: Phase Current Supv Pickup	0.150 pu
BF1: Neutral Current Supv Pickup	0.150 pu
BF1: Use Timer 1	Yes
BF1: Timer 1 Pickup Delay	0.200 s
BF1: Use Timer 2	No
BF1: Timer 2 Pickup Delay	0.000 s
BF1: Use Timer 3	No
BF1: Timer 3 Pickup Delay	0.000 s
BF1: Breaker Pos1 Phase A/3P	Polo 1 cerr On(H7c)
BF1: Breaker Pos2 Phase A/3P	OFF
BF1: Breaker Test On	ON
BF1: Phase Current HiSet Pickup	0.150 pu
BF1: Neutral Current HiSet Pickup	0.150 pu
BF1: Phase Current LoSet Pickup	0.150 pu
BF1: Neutral Current LoSet Pickup	0.150 pu
BF1: LoSet Time Delay	0.000 s
BF1: Trip Dropout Delay	0.000 s
BF1: Target	Self-reset
BF1: Events	Enabled
BF1: Phase A Initiate	Trip polo 1 On(W5c)
BF1: Phase B Initiate	Trip polo 2 On(W6a)
BF1: Phase C Initiate	Trip polo 3 On(W6c)
BF1: Breaker Pos1 Phase B	Polo 2 cerr On(H8a)
BF1: Breaker Pos1 Phase C	Polo 3 cerr On(H8c)
BF1: Breaker Pos2 Phase B	OFF
BF1: Breaker Pos2 Phase C	OFF

CONTROL ELEMENTS

TRIP OUTPUT

Trip Mode	3 Pole & 1 Pole
Trip 3-Pole Input1	Trip 3p On (VO1)
Trip 3-Pole Input2	OFF
Trip 3-Pole Input3	OFF
Trip 3-Pole Input4	OFF
Trip 3-Pole Input5	OFF
Trip 3-Pole Input6	OFF
Trip 1-Pole Input1	GND DIST Z1 OP
Trip 1-Pole Input2	OFF
Trip 1-Pole Input3	OFF
Trip 1-Pole Input4	OFF
Trip 1-Pole Input5	OFF
Trip 1-Pole Input6	OFF
Trip Reclose Input1	GND DIST Z1 OP
Trip Reclose Input2	AR 3P START On (VO17)
Trip Reclose Input3	OFF
Trip Reclose Input4	OFF
Trip Reclose Input5	OFF
Trip Reclose Input6	OFF
Trip Seal in Delay	0.000 s
Trip Reset	Pole Curr OR Custom

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TRIP OUTPUT (continued from last page)

Start Timer Z2Ph In1	OFF
Start Timer Z2Ph In2	OFF
Start Timer Z2Gr In1	OFF
Start Timer Z2Gr In2	OFF
BKR Phase A Open	OFF
BKR Phase B Open	OFF
BKR Phase C Open	OFF
Trip Force 3-Pole	OFF
Trip Pilot Priority	0.000 s
Reverse Fault	OFF
Trip Delay On Evolving Faults	0.000 s
Trip Events	Disabled

SYNCHROCHECK

SYNCHROCHECK1: Function	Enabled
SYNCHROCHECK1: Block	OFF
SYNCHROCHECK1: V1 Source	SRC 1 (SRC 1)
SYNCHROCHECK1: V2 Source	SRC 2 (SRC 2)
SYNCHROCHECK1: Max Volt Diff	40173 V
SYNCHROCHECK1: Max Angle Diff	30 deg
SYNCHROCHECK1: Max Freq Diff	0.10 Hz
SYNCHROCHECK1: Freq Hysteresis	0.06 Hz
SYNCHROCHECK1: Dead Source Select	None
SYNCHROCHECK1: Dead V1 Max Volt	0.20 pu
SYNCHROCHECK1: Dead V2 Max Volt	0.20 pu
SYNCHROCHECK1: Live V1 Min Volt	0.70 pu
SYNCHROCHECK1: Live V2 Min Volt	0.70 pu
SYNCHROCHECK1: Target	Self-reset
SYNCHROCHECK1: Events	Enabled

MONITORING ELEMENTS

VT FUSE FAILURE

VT FUSE FAILURE 1: Function	Enabled

OPEN POLE

Function	Enabled
Block	OFF
Voltage SUPV	Disabled
Current Pickup	0.030 pu
Open Pole Line XC1	9999.9 ohms
Open Pole Line XC0	9999.9 ohms
Open Pole REM Current PKP	0.050 pu
Open Pole Mode	Accelerated
Open Pole Detection	I AND V AND CBaux
Target	Latched
Events	Enabled

PILOT SCHEMES

1P HYBRID POTT SCHEME

Function	Enabled
Block	OFF
Permissive Echo	Custom
Echo Condition	ECHO TX On (VO67)
Weak Infeed	Disabled
W/I Condition	OFF
Rx Pickup Delay	0.001 s
Trans Block Pickup Delay	0.030 s
Trans Block Reset Delay	0.170 s
Echo Duration	0.100 s
Echo Lockout	0.250 s
Seal-In Delay	0.100 s
Gnd Dir OC Fwd	OFF
Gnd Dir OC Rev	OFF
No of Comm Bits	1
Rx1	RX. 85A On (VO21)

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DESCRIPTION: (NONE)
TEXT COLOR

1P HYBRID POTT SCHEME (continued from last page)

Rx2	OFF
Rx3	OFF
Rx4	OFF
Target	Self-reset
Event	Enabled

AUTORECLOSE 1P

Function	Enabled
Mode	3 Pole - B
Max Number Of Shots	1
AR Initiate Mode	Protection only
Block BKR1	Bloq. 79 On (VO6)
Close Time BKR1	0.10 s
BKR Man Close	OFF
Blk Time Upon Man Cls	8.00 s
1-P Init	OFF
3-P Init	AR 3P START On (VO17)
3-P TD Init	OFF
Multi P Fault	OFF
BKR 1 Pole Open	OFF
BKR 3 Pole Open	52A10 Abiert On(M7a)
3-P Dead Time 1	0.50 s
3-P Dead Time 2	1.20 s
3-P Dead Time 3	2.00 s
3-P Dead Time 4	4.00 s
Extend Dead T1	OFF
Dead T1 Extension	0.00 s
Reset	BREAKER 1 CLOSED
Reset Time	8.00 s
BKR Closed	OFF
Block	Bloq. 79 On (VO6)
Pause	OFF
Inc Seq Time	5.00 s
Block BKR2	OFF
Close Time BKR2	0.10 s
Transfer 1 to 2	No
Transfer 2 to 1	No
BKR1 Fail Option	Continue
BKR2 Fail Option	Continue
1-P Dead Time	1.00 s
BKR Sequence	1
Transfer Time	4.00 s
BUS FLT Init	OFF
Event	Enabled

INPUTS/OUTPUTS

CONTACT INPUTS

[H7A] Contact Input 1 ID	52 apto
[H7A] Contact Input 1 Debounce Time	2.0 ms
[H7A] Contact Input 1 Events	Disabled
[H7C] Contact Input 2 ID	Polo 1 cerr
[H7C] Contact Input 2 Debounce Time	2.0 ms
[H7C] Contact Input 2 Events	Disabled
[H8A] Contact Input 3 ID	Polo 2 cerr
[H8A] Contact Input 3 Debounce Time	2.0 ms
[H8A] Contact Input 3 Events	Disabled
[H8C] Contact Input 4 ID	Polo 3 cerr
[H8C] Contact Input 4 Debounce Time	2.0 ms
[H8C] Contact Input 4 Events	Disabled
[M7A] Contact Input 5 ID	52A10 Abiert
[M7A] Contact Input 5 Debounce Time	2.0 ms
[M7A] Contact Input 5 Events	Disabled
[M7C] Contact Input 6 ID	Cont Ip 6
[M7C] Contact Input 6 Debounce Time	2.0 ms
[M7C] Contact Input 6 Events	Disabled

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DESCRIPTION: (NONE)
TEXT COLOR

CONTACT INPUTS (continued from last page)

[M8A] Contact Input 7 ID	P.Cort. Abie
[M8A] Contact Input 7 Debounce Time	2.0 ms
[M8A] Contact Input 7 Events	Disabled
[M8C] Contact Input 8 ID	P.Cort. Cerr
[M8C] Contact Input 8 Debounce Time	2.0 ms
[M8C] Contact Input 8 Events	Disabled
[P7A] Contact Input 9 ID	Rec. en prog
[P7A] Contact Input 9 Debounce Time	2.0 ms
[P7A] Contact Input 9 Events	Disabled
[P7C] Contact Input 10 ID	Bloq. 79 p43
[P7C] Contact Input 10 Debounce Time	2.0 ms
[P7C] Contact Input 10 Events	Disabled
[P8A] Contact Input 11 ID	Aviso Cierre
[P8A] Contact Input 11 Debounce Time	2.0 ms
[P8A] Contact Input 11 Events	Disabled
[P8C] Contact Input 12 ID	Op. 86B
[P8C] Contact Input 12 Debounce Time	2.0 ms
[P8C] Contact Input 12 Events	Disabled
[U7A] Contact Input 13 ID	Falla TP Lin
[U7A] Contact Input 13 Debounce Time	2.0 ms
[U7A] Contact Input 13 Events	Disabled
[U7C] Contact Input 14 ID	Falla TP Bar
[U7C] Contact Input 14 Debounce Time	2.0 ms
[U7C] Contact Input 14 Events	Disabled
[U8A] Contact Input 15 ID	Rx. 85A1
[U8A] Contact Input 15 Debounce Time	2.0 ms
[U8A] Contact Input 15 Events	Disabled
[U8C] Contact Input 16 ID	Rx. 85D
[U8C] Contact Input 16 Debounce Time	2.0 ms
[U8C] Contact Input 16 Events	Disabled
[W5A] Contact Input 17 ID	Hab. Reconex
[W5A] Contact Input 17 Debounce Time	2.0 ms
[W5A] Contact Input 17 Events	Disabled
[W5C] Contact Input 18 ID	Trip polo 1
[W5C] Contact Input 18 Debounce Time	2.0 ms
[W5C] Contact Input 18 Events	Disabled
[W6A] Contact Input 19 ID	Trip polo 2
[W6A] Contact Input 19 Debounce Time	2.0 ms
[W6A] Contact Input 19 Events	Disabled
[W6C] Contact Input 20 ID	Trip polo 3
[W6C] Contact Input 20 Debounce Time	2.0 ms
[W6C] Contact Input 20 Events	Disabled
[W7A] Contact Input 21 ID	Start BF 87B
[W7A] Contact Input 21 Debounce Time	2.0 ms
[W7A] Contact Input 21 Events	Disabled
[W7C] Contact Input 22 ID	Rx. 85A2
[W7C] Contact Input 22 Debounce Time	2.0 ms
[W7C] Contact Input 22 Events	Disabled
[W8A] Contact Input 23 ID	Rx. 85C 1
[W8A] Contact Input 23 Debounce Time	2.0 ms
[W8A] Contact Input 23 Events	Disabled
[W8C] Contact Input 24 ID	Rx.85C 2
[W8C] Contact Input 24 Debounce Time	2.0 ms
[W8C] Contact Input 24 Events	Disabled

CONTACT INPUT THRESHOLDS

52 apto, Polo 1 cerr, Polo 2 cerr, Polo 3 cerr(H7a, H7c, H8a, H8c)	33 Vdc
52A10 Abiert, Cont Ip 6, P.Cort. Abie, P.Cort. Cerr(M7a, M7c, M8a, M8c)	33 Vdc
Rec. en prog, Bloq. 79 p43, Aviso Cierre, Op. 86B(P7a, P7c, P8a, P8c)	33 Vdc
Falla TP Lin, Falla TP Bar, Rx. 85A1, Rx. 85D(U7a, U7c, U8a, U8c)	33 Vdc
Hab. Reconex, Trip polo 1, Trip polo 2, Trip polo 3(W5a, W5c, W6a, W6c)	33 Vdc
Start BF 87B, Rx. 85A2, Rx. 85C 1, Rx.85C 2(W7a, W7c, W8a, W8c)	33 Vdc

CONTACT OUTPUTS

[H1] Contact Output 1 ID	50BF

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TEXT COLOR

CONTACT OUTPUTS (continued from last page)

[H1] Contact Output 1 Operate	BKR FAIL 1 T1 OP
[H1] Contact Output 1 Seal-In	OFF
[H1] Contact Output 1 Events	Enabled
[H2] Contact Output 2 ID	79 52AR
[H2] Contact Output 2 Operate	AR CLOSE BKR 1
[H2] Contact Output 2 Seal-In	OFF
[H2] Contact Output 2 Events	Enabled
[H3] Contact Output 3 ID	PKP Z3 EDAG
[H3] Contact Output 3 Operate	PKP Z3 On (VO66)
[H3] Contact Output 3 Seal-In	OFF
[H3] Contact Output 3 Events	Enabled
[H6] Contact Output 6 ID	TRIP SCADA
[H6] Contact Output 6 Operate	TRIP OUTPUT OP
[H6] Contact Output 6 Seal-In	OFF
[H6] Contact Output 6 Events	Enabled
[M3] Contact Output 9 ID	TX 85A1
[M3] Contact Output 9 Operate	Emision 85A On (VO24)
[M3] Contact Output 9 Seal-In	OFF
[M3] Contact Output 9 Events	Enabled
[M4] Contact Output 10 ID	TX 85D
[M4] Contact Output 10 Operate	Tx. 85D On (VO22)
[M4] Contact Output 10 Seal-In	OFF
[M4] Contact Output 10 Events	Enabled
[M5] Contact Output 11 ID	TRIP
[M5] Contact Output 11 Operate	BKR FAIL 1 T1 OP
[M5] Contact Output 11 Seal-In	OFF
[M5] Contact Output 11 Events	Enabled
[M6] Contact Output 12 ID	Rec. en prog
[M6] Contact Output 12 Operate	AR RIP
[M6] Contact Output 12 Seal-In	OFF
[M6] Contact Output 12 Events	Enabled
[P1] Contact Output 13 ID	Prueba HPOTT
[P1] Contact Output 13 Operate	HYBRID POTT OP
[P1] Contact Output 13 Seal-In	OFF
[P1] Contact Output 13 Events	Enabled
[P2] Contact Output 14 ID	TRIP POLO A
[P2] Contact Output 14 Operate	TRIP PHASE A
[P2] Contact Output 14 Seal-In	OFF
[P2] Contact Output 14 Events	Enabled
[P3] Contact Output 15 ID	TRIP POLO B
[P3] Contact Output 15 Operate	TRIP PHASE B
[P3] Contact Output 15 Seal-In	OFF
[P3] Contact Output 15 Events	Enabled
[P4] Contact Output 16 ID	TRIP POLO C
[P4] Contact Output 16 Operate	TRIP PHASE C
[P4] Contact Output 16 Seal-In	OFF
[P4] Contact Output 16 Events	Enabled
[P5] Contact Output 17 ID	TRIP POLO A
[P5] Contact Output 17 Operate	TRIP PHASE A
[P5] Contact Output 17 Seal-In	OFF
[P5] Contact Output 17 Events	Enabled
[P6] Contact Output 18 ID	TRIP POLO B
[P6] Contact Output 18 Operate	TRIP PHASE B
[P6] Contact Output 18 Seal-In	OFF
[P6] Contact Output 18 Events	Enabled
[U1] Contact Output 19 ID	TRIP POLO C
[U1] Contact Output 19 Operate	TRIP PHASE C
[U1] Contact Output 19 Seal-In	OFF
[U1] Contact Output 19 Events	Enabled
[U2] Contact Output 20 ID	orden 79
[U2] Contact Output 20 Operate	AR CLOSE BKR 1
[U2] Contact Output 20 Seal-In	OFF
[U2] Contact Output 20 Events	Enabled
[U3] Contact Output 21 ID	RETRIP A
[U3] Contact Output 21 Operate	BKR FAIL 1 RETRIP

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DESCRIPTION: (NONE)
TEXT COLOR

CONTACT OUTPUTS (continued from last page)

[U3] Contact Output 21 Seal-In	OFF
[U3] Contact Output 21 Events	Enabled
[U4] Contact Output 22 ID	RETRIP B
[U4] Contact Output 22 Operate	BKR FAIL 1 RETRIP
[U4] Contact Output 22 Seal-In	OFF
[U4] Contact Output 22 Events	Enabled
[U5] Contact Output 23 ID	RETRIP C
[U5] Contact Output 23 Operate	BKR FAIL 1 RETRIP
[U5] Contact Output 23 Seal-In	OFF
[U5] Contact Output 23 Events	Enabled
[W1] Contact Output 25 ID	TX. 85A2
[W1] Contact Output 25 Operate	Emision 85A On (VO24)
[W1] Contact Output 25 Seal-In	OFF
[W1] Contact Output 25 Events	Enabled
[W2] Contact Output 26 ID	TX. 85D
[W2] Contact Output 26 Operate	Tx. 85D On (VO22)
[W2] Contact Output 26 Seal-In	OFF
[W2] Contact Output 26 Events	Enabled

VIRTUAL OUTPUTS

Virtual Output 1 ID	Trip 3p
Virtual Output 1 Events	Enabled
Virtual Output 2 ID	Blq.21Z1 21N
Virtual Output 2 Events	Enabled
Virtual Output 3 ID	Blq.21Z2-Z5
Virtual Output 3 Events	Enabled
Virtual Output 4 ID	Start 50BF
Virtual Output 4 Events	Enabled
Virtual Output 5 ID	Trip 85D
Virtual Output 5 Events	Enabled
Virtual Output 6 ID	Bloq. 79
Virtual Output 6 Events	Enabled
Virtual Output 7 ID	Open 3p
Virtual Output 7 Events	Enabled
Virtual Output 8 ID	VT ok
Virtual Output 8 Events	Enabled
Virtual Output 9 ID	LED Z1 Op.
Virtual Output 9 Events	Disabled
Virtual Output 10 ID	LED Z1B Op.
Virtual Output 10 Events	Disabled
Virtual Output 11 ID	LED Z2 Op.
Virtual Output 11 Events	Disabled
Virtual Output 12 ID	LED Z3 Op.
Virtual Output 12 Events	Disabled
Virtual Output 13 ID	LED Z4 Op.
Virtual Output 13 Events	Disabled
Virtual Output 14 ID	LED 51-51N
Virtual Output 14 Events	Disabled
Virtual Output 15 ID	LED ECHO
Virtual Output 15 Events	Disabled
Virtual Output 16 ID	LED 67N
Virtual Output 16 Events	Disabled
Virtual Output 17 ID	AR 3P START
Virtual Output 17 Events	Enabled
Virtual Output 21 ID	RX. 85A
Virtual Output 21 Events	Enabled
Virtual Output 22 ID	Tx. 85D
Virtual Output 22 Events	Enabled
Virtual Output 23 ID	BLOCK HYBRID
Virtual Output 23 Events	Enabled
Virtual Output 24 ID	Emision 85A
Virtual Output 24 Events	Enabled
Virtual Output 30 ID	DNP 79 BLOQ
Virtual Output 30 Events	Disabled
Virtual Output 31 ID	DNP 79 ON

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VIRTUAL OUTPUTS (continued from last page)

Virtual Output 31 Events	Disabled
Virtual Output 32 ID	DNP TP LINEA
Virtual Output 32 Events	Disabled
Virtual Output 33 ID	DNP TP BARRA
Virtual Output 33 Events	Disabled
Virtual Output 34 ID	DNP RX RAN
Virtual Output 34 Events	Disabled
Virtual Output 35 ID	DNP TX 85A
Virtual Output 35 Events	Disabled
Virtual Output 36 ID	DNP RX JAH
Virtual Output 36 Events	Disabled
Virtual Output 37 ID	DNP ECHO
Virtual Output 37 Events	Disabled
Virtual Output 38 ID	DNP 79 CLOSE
Virtual Output 38 Events	Disabled
Virtual Output 39 ID	DNP 21/21N
Virtual Output 39 Events	Disabled
Virtual Output 40 ID	DNP 67N
Virtual Output 40 Events	Disabled
Virtual Output 41 ID	DNP 50BF
Virtual Output 41 Events	Disabled
Virtual Output 42 ID	DNP Z1B
Virtual Output 42 Events	Disabled
Virtual Output 43 ID	DNP Z1
Virtual Output 43 Events	Disabled
Virtual Output 44 ID	DNP Z2
Virtual Output 44 Events	Disabled
Virtual Output 45 ID	DNP Z3
Virtual Output 45 Events	Disabled
Virtual Output 46 ID	DNP Z4
Virtual Output 46 Events	Disabled
Virtual Output 47 ID	DNP 51/51N
Virtual Output 47 Events	Disabled
Virtual Output 48 ID	DNP TRIP A
Virtual Output 48 Events	Disabled
Virtual Output 49 ID	DNP TRIP B
Virtual Output 49 Events	Disabled
Virtual Output 50 ID	DNP TRIP C
Virtual Output 50 Events	Disabled
Virtual Output 51 ID	DNP TRIP GND
Virtual Output 51 Events	Disabled
Virtual Output 52 ID	DNP TRIP S1
Virtual Output 52 Events	Disabled
Virtual Output 53 ID	DNP PICKUP
Virtual Output 53 Events	Disabled
Virtual Output 54 ID	DNP MOD EMER
Virtual Output 54 Events	Disabled
Virtual Output 55 ID	DNP SOTF
Virtual Output 55 Events	Disabled
Virtual Output 56 ID	DNP VT FAIL
Virtual Output 56 Events	Disabled
Virtual Output 57 ID	DNP PSWING
Virtual Output 57 Events	Disabled
Virtual Output 58 ID	DNP 79BLQ EX
Virtual Output 58 Events	Disabled
Virtual Output 59 ID	DNP RX85D
Virtual Output 59 Events	Disabled
Virtual Output 60 ID	DNP TX85D
Virtual Output 60 Events	Disabled
Virtual Output 61 ID	DNP INC PCOR
Virtual Output 61 Events	Disabled
Virtual Output 64 ID	Osc Trigger
Virtual Output 64 Events	Enabled
Virtual Output 65 ID	Z5 EDAG
Virtual Output 65 Events	Disabled

URS A10 DESPUÏS DE CAMBIO DE AJUSTES 27.03.2015.URS
C:\USERS\MMISSENE\DESKTOP\MMM\ACTUALIZACIУN CRAPS\TINGU\A10
DEVICE DEFINITION
FILES
ORDER CODE: D60-K03-HCH-F8L-H6U-M6U-P6U-U6U-W6T
VERSION: 5.7X
UR SERIAL NUMBER: AE5C09000045
SETTINGS SEND TO RELAY: SATURDAY, FEBRUARY 07, 2015 09:58:17
DESCRIPTION: (NONE)
TEXT COLOR

VIRTUAL OUTPUTS (continued from last page)

Virtual Output 66 ID	PKP Z3
Virtual Output 66 Events	Enabled
Virtual Output 67 ID	ECHO TX
Virtual Output 67 Events	Enabled

REMOTE DEVICES

Remote Device 1 ID	Remote Device 1
Remote Device 1 ETYPE APPID	0
Remote Device 1 DATASET	Fixed
Remote Device 2 ID	Remote Device 2
Remote Device 2 ETYPE APPID	0
Remote Device 2 DATASET	Fixed
Remote Device 3 ID	Remote Device 3
Remote Device 3 ETYPE APPID	0
Remote Device 3 DATASET	Fixed
Remote Device 4 ID	Remote Device 4
Remote Device 4 ETYPE APPID	0
Remote Device 4 DATASET	Fixed
Remote Device 5 ID	Remote Device 5
Remote Device 5 ETYPE APPID	0
Remote Device 5 DATASET	Fixed
Remote Device 6 ID	Remote Device 6
Remote Device 6 ETYPE APPID	0
Remote Device 6 DATASET	Fixed
Remote Device 7 ID	Remote Device 7
Remote Device 7 ETYPE APPID	0
Remote Device 7 DATASET	Fixed
Remote Device 8 ID	Remote Device 8
Remote Device 8 ETYPE APPID	0
Remote Device 8 DATASET	Fixed
Remote Device 9 ID	Remote Device 9
Remote Device 9 ETYPE APPID	0
Remote Device 9 DATASET	Fixed
Remote Device 10 ID	Remote Device 10
Remote Device 10 ETYPE APPID	0
Remote Device 10 DATASET	Fixed
Remote Device 11 ID	Remote Device 11
Remote Device 11 ETYPE APPID	0
Remote Device 11 DATASET	Fixed
Remote Device 12 ID	Remote Device 12
Remote Device 12 ETYPE APPID	0
Remote Device 12 DATASET	Fixed
Remote Device 13 ID	Remote Device 13
Remote Device 13 ETYPE APPID	0
Remote Device 13 DATASET	Fixed
Remote Device 14 ID	Remote Device 14
Remote Device 14 ETYPE APPID	0
Remote Device 14 DATASET	Fixed
Remote Device 15 ID	Remote Device 15
Remote Device 15 ETYPE APPID	0
Remote Device 15 DATASET	Fixed
Remote Device 16 ID	Remote Device 16
Remote Device 16 ETYPE APPID	0
Remote Device 16 DATASET	Fixed

IEC 61850 GOOSE ANALOGS INPUTS

IEC61850 GOOSE Analog Input 1 Default Value	1000.000
IEC61850 GOOSE Analog Input 1 Mode	Default Value
IEC61850 GOOSE Analog Input 1 Units	
IEC61850 GOOSE Analog Input 1 PU Base	1.000
IEC61850 GOOSE Analog Input 2 Default Value	1000.000
IEC61850 GOOSE Analog Input 2 Mode	Default Value
IEC61850 GOOSE Analog Input 2 Units	
IEC61850 GOOSE Analog Input 2 PU Base	1.000
IEC61850 GOOSE Analog Input 3 Default Value	1000.000

URS A10 DESPUÏS DE CAMBIO DE AJUSTES 27.03.2015.URS
C:\USERS\MMISSENE\DESKTOP\MMM\ACTUALIZACIУN CRAPS\TINGU\A10
DEVICE DEFINITION
FILES
ORDER CODE: D60-K03-HCH-F8L-H6U-M6U-P6U-U6U-W6T
VERSION: 5.7X
UR SERIAL NUMBER: AE5C09000045
SETTINGS SEND TO RELAY: SATURDAY, FEBRUARY 07, 2015 09:58:17
DESCRIPTION: (NONE)
TEXT COLOR

IEC 61850 GOOSE ANALOGS INPUTS (continued from last page)

IEC61850 GOOSE Analog Input 3 Mode	Default Value
IEC61850 GOOSE Analog Input 3 Units	
IEC61850 GOOSE Analog Input 3 PU Base	1.000
IEC61850 GOOSE Analog Input 4 Default Value	1000.000
IEC61850 GOOSE Analog Input 4 Mode	Default Value
IEC61850 GOOSE Analog Input 4 Units	
IEC61850 GOOSE Analog Input 4 PU Base	1.000
IEC61850 GOOSE Analog Input 5 Default Value	1000.000
IEC61850 GOOSE Analog Input 5 Mode	Default Value
IEC61850 GOOSE Analog Input 5 Units	
IEC61850 GOOSE Analog Input 5 PU Base	1.000
IEC61850 GOOSE Analog Input 6 Default Value	1000.000
IEC61850 GOOSE Analog Input 6 Mode	Default Value
IEC61850 GOOSE Analog Input 6 Units	
IEC61850 GOOSE Analog Input 6 PU Base	1.000
IEC61850 GOOSE Analog Input 7 Default Value	1000.000
IEC61850 GOOSE Analog Input 7 Mode	Default Value
IEC61850 GOOSE Analog Input 7 Units	
IEC61850 GOOSE Analog Input 7 PU Base	1.000
IEC61850 GOOSE Analog Input 8 Default Value	1000.000
IEC61850 GOOSE Analog Input 8 Mode	Default Value
IEC61850 GOOSE Analog Input 8 Units	
IEC61850 GOOSE Analog Input 8 PU Base	1.000
IEC61850 GOOSE Analog Input 9 Default Value	1000.000
IEC61850 GOOSE Analog Input 9 Mode	Default Value
IEC61850 GOOSE Analog Input 9 Units	
IEC61850 GOOSE Analog Input 9 PU Base	1.000
IEC61850 GOOSE Analog Input 10 Default Value	1000.000
IEC61850 GOOSE Analog Input 10 Mode	Default Value
IEC61850 GOOSE Analog Input 10 Units	
IEC61850 GOOSE Analog Input 10 PU Base	1.000
IEC61850 GOOSE Analog Input 11 Default Value	1000.000
IEC61850 GOOSE Analog Input 11 Mode	Default Value
IEC61850 GOOSE Analog Input 11 Units	
IEC61850 GOOSE Analog Input 11 PU Base	1.000
IEC61850 GOOSE Analog Input 12 Default Value	1000.000
IEC61850 GOOSE Analog Input 12 Mode	Default Value
IEC61850 GOOSE Analog Input 12 Units	
IEC61850 GOOSE Analog Input 12 PU Base	1.000
IEC61850 GOOSE Analog Input 13 Default Value	1000.000
IEC61850 GOOSE Analog Input 13 Mode	Default Value
IEC61850 GOOSE Analog Input 13 Units	
IEC61850 GOOSE Analog Input 13 PU Base	1.000
IEC61850 GOOSE Analog Input 14 Default Value	1000.000
IEC61850 GOOSE Analog Input 14 Mode	Default Value
IEC61850 GOOSE Analog Input 14 Units	
IEC61850 GOOSE Analog Input 14 PU Base	1.000
IEC61850 GOOSE Analog Input 15 Default Value	1000.000
IEC61850 GOOSE Analog Input 15 Mode	Default Value
IEC61850 GOOSE Analog Input 15 Units	
IEC61850 GOOSE Analog Input 15 PU Base	1.000
IEC61850 GOOSE Analog Input 16 Default Value	1000.000
IEC61850 GOOSE Analog Input 16 Mode	Default Value
IEC61850 GOOSE Analog Input 16 Units	
IEC61850 GOOSE Analog Input 16 PU Base	1.000
IEC61850 GOOSE Analog Input 17 Default Value	1000.000
IEC61850 GOOSE Analog Input 17 Mode	Default Value
IEC61850 GOOSE Analog Input 17 Units	
IEC61850 GOOSE Analog Input 17 PU Base	1.000
IEC61850 GOOSE Analog Input 18 Default Value	1000.000
IEC61850 GOOSE Analog Input 18 Mode	Default Value
IEC61850 GOOSE Analog Input 18 Units	
IEC61850 GOOSE Analog Input 18 PU Base	1.000
IEC61850 GOOSE Analog Input 19 Default Value	1000.000
IEC61850 GOOSE Analog Input 19 Mode	Default Value

URS A10 DESPUÏS DE CAMBIO DE AJUSTES 27.03.2015.URS
C:\USERS\MMISSENE\DESKTOP\MMM\ACTUALIZACIУN CRAPS\TINGU\A10
DEVICE DEFINITION
FILES
ORDER CODE: D60-K03-HCH-F8L-H6U-M6U-P6U-U6U-W6T
VERSION: 5.7X
UR SERIAL NUMBER: AE5C09000045
SETTINGS SEND TO RELAY: SATURDAY, FEBRUARY 07, 2015 09:58:17
DESCRIPTION: (NONE)
TEXT COLOR

IEC 61850 GOOSE ANALOGS INPUTS (continued from last page)

IEC61850 GOOSE Analog Input 19 Units	
IEC61850 GOOSE Analog Input 19 PU Base	1.000
IEC61850 GOOSE Analog Input 20 Default Value	1000.000
IEC61850 GOOSE Analog Input 20 Mode	Default Value
IEC61850 GOOSE Analog Input 20 Units	
IEC61850 GOOSE Analog Input 20 PU Base	1.000
IEC61850 GOOSE Analog Input 21 Default Value	1000.000
IEC61850 GOOSE Analog Input 21 Mode	Default Value
IEC61850 GOOSE Analog Input 21 Units	
IEC61850 GOOSE Analog Input 21 PU Base	1.000
IEC61850 GOOSE Analog Input 22 Default Value	1000.000
IEC61850 GOOSE Analog Input 22 Mode	Default Value
IEC61850 GOOSE Analog Input 22 Units	
IEC61850 GOOSE Analog Input 22 PU Base	1.000
IEC61850 GOOSE Analog Input 23 Default Value	1000.000
IEC61850 GOOSE Analog Input 23 Mode	Default Value
IEC61850 GOOSE Analog Input 23 Units	
IEC61850 GOOSE Analog Input 23 PU Base	1.000
IEC61850 GOOSE Analog Input 24 Default Value	1000.000
IEC61850 GOOSE Analog Input 24 Mode	Default Value
IEC61850 GOOSE Analog Input 24 Units	
IEC61850 GOOSE Analog Input 24 PU Base	1.000
IEC61850 GOOSE Analog Input 25 Default Value	1000.000
IEC61850 GOOSE Analog Input 25 Mode	Default Value
IEC61850 GOOSE Analog Input 25 Units	
IEC61850 GOOSE Analog Input 25 PU Base	1.000
IEC61850 GOOSE Analog Input 26 Default Value	1000.000
IEC61850 GOOSE Analog Input 26 Mode	Default Value
IEC61850 GOOSE Analog Input 26 Units	
IEC61850 GOOSE Analog Input 26 PU Base	1.000
IEC61850 GOOSE Analog Input 27 Default Value	1000.000
IEC61850 GOOSE Analog Input 27 Mode	Default Value
IEC61850 GOOSE Analog Input 27 Units	
IEC61850 GOOSE Analog Input 27 PU Base	1.000
IEC61850 GOOSE Analog Input 28 Default Value	1000.000
IEC61850 GOOSE Analog Input 28 Mode	Default Value
IEC61850 GOOSE Analog Input 28 Units	
IEC61850 GOOSE Analog Input 28 PU Base	1.000
IEC61850 GOOSE Analog Input 29 Default Value	1000.000
IEC61850 GOOSE Analog Input 29 Mode	Default Value
IEC61850 GOOSE Analog Input 29 Units	
IEC61850 GOOSE Analog Input 29 PU Base	1.000
IEC61850 GOOSE Analog Input 30 Default Value	1000.000
IEC61850 GOOSE Analog Input 30 Mode	Default Value
IEC61850 GOOSE Analog Input 30 Units	
IEC61850 GOOSE Analog Input 30 PU Base	1.000
IEC61850 GOOSE Analog Input 31 Default Value	1000.000
IEC61850 GOOSE Analog Input 31 Mode	Default Value
IEC61850 GOOSE Analog Input 31 Units	
IEC61850 GOOSE Analog Input 31 PU Base	1.000
IEC61850 GOOSE Analog Input 32 Default Value	1000.000
IEC61850 GOOSE Analog Input 32 Mode	Default Value
IEC61850 GOOSE Analog Input 32 Units	
IEC61850 GOOSE Analog Input 32 PU Base	1.000

IEC 61850 GOOSE UINTEGERS INPUTS

IEC61850 GOOSE UInteger Input 1 Default Value	1000
IEC61850 GOOSE UInteger Input 1 Mode	Default Value
IEC61850 GOOSE UInteger Input 2 Default Value	1000
IEC61850 GOOSE UInteger Input 2 Mode	Default Value
IEC61850 GOOSE UInteger Input 3 Default Value	1000
IEC61850 GOOSE UInteger Input 3 Mode	Default Value
IEC61850 GOOSE UInteger Input 4 Default Value	1000
IEC61850 GOOSE UInteger Input 4 Mode	Default Value
IEC61850 GOOSE UInteger Input 5 Default Value	1000

URS A10 DESPUÏS DE CAMBIO DE AJUSTES 27.03.2015.URS
C:\USERS\MMISSENE\DESKTOP\MMM\ACTUALIZACIУN CRAPS\TINGU\A10
DEVICE DEFINITION
FILES
ORDER CODE: D60-K03-HCH-F8L-H6U-M6U-P6U-U6U-W6T
VERSION: 5.7X
UR SERIAL NUMBER: AE5C09000045
SETTINGS SEND TO RELAY: SATURDAY, FEBRUARY 07, 2015 09:58:17
DESCRIPTION: (NONE)
TEXT COLOR

IEC 61850 GOOSE UINTEGERS INPUTS (continued from last page)

IEC61850 GOOSE UInteger Input 5 Mode	Default Value
IEC61850 GOOSE UInteger Input 6 Default Value	1000
IEC61850 GOOSE UInteger Input 6 Mode	Default Value
IEC61850 GOOSE UInteger Input 7 Default Value	1000
IEC61850 GOOSE UInteger Input 7 Mode	Default Value
IEC61850 GOOSE UInteger Input 8 Default Value	1000
IEC61850 GOOSE UInteger Input 8 Mode	Default Value
IEC61850 GOOSE UInteger Input 9 Default Value	1000
IEC61850 GOOSE UInteger Input 9 Mode	Default Value
IEC61850 GOOSE UInteger Input 10 Default Value	1000
IEC61850 GOOSE UInteger Input 10 Mode	Default Value
IEC61850 GOOSE UInteger Input 11 Default Value	1000
IEC61850 GOOSE UInteger Input 11 Mode	Default Value
IEC61850 GOOSE UInteger Input 12 Default Value	1000
IEC61850 GOOSE UInteger Input 12 Mode	Default Value
IEC61850 GOOSE UInteger Input 13 Default Value	1000
IEC61850 GOOSE UInteger Input 13 Mode	Default Value
IEC61850 GOOSE UInteger Input 14 Default Value	1000
IEC61850 GOOSE UInteger Input 14 Mode	Default Value
IEC61850 GOOSE UInteger Input 15 Default Value	1000
IEC61850 GOOSE UInteger Input 15 Mode	Default Value
IEC61850 GOOSE UInteger Input 16 Default Value	1000
IEC61850 GOOSE UInteger Input 16 Mode	Default Value

INFORME (s) CDEC Nº: **IF N° 00035/2016**	FECHA DE FALLA: **07 DE ENERO 2016**
INSTALACIÓN (ES) EDAC CONTINGENCIA EXTREMA SE SAN VICENTE DE TAGUA-TAGUA	

1. CAUSA U ORIGEN DE LA FALLA

1.1. Fecha y hora de la Falla

Fecha	**07 de Enero de 2016**
Hora	01:13

1.2. Localización de la falla

Falla externa, que de acuerdo a lo informado por medios oficiales del CDEC-SIC se origina por la desconexión de la línea de 154 kV Tinguiririca – Rancagua – Alto Jahuel N°2 de propiedad de Transelec S.A. (Ver Novedades relevantes del CDEC-SIC en Anexo N°3).

1.3. Causa de la Falla

Falla externa, que de acuerdo a lo informado por medios oficiales del CDEC-SIC se origina por la desconexión de la línea de 154 kV Tinguiririca – Rancagua – Alto Jahuel N°2 de propiedad de Transelec S.A. (Ver Novedades relevantes del CDEC-SIC en Anexo N°3).
Lo anterior provoca la inestabilidad de frecuencia del sistema generando la operación del esquema EDAC por Contingencia Extrema.

1.4. Código falla

Causas de Falla	**Código**	**Descripción**
Fenómeno Físico	(*)	
Elemento del Sistema Eléctrico	(*)	
Fenómeno Eléctrico	FR81	Frecuencia
Modo	13	Opera según lo esperado

(*) La falla se produjo en la línea 154 kV Alto Jahuel – Rancagua – Tinguiririca, de propiedad de TRASNELEC. No corresponde a Transnet pronunciarse sobre falla en instalaciones de terceros.

INFORME (s) CDEC Nº: **IF N° 00035/2016**	FECHA DE FALLA: **07 DE ENERO 2016**
INSTALACIÓN (ES) EDAC CONTINGENCIA EXTREMA SE SAN VICENTE DE TAGUA-TAGUA	

Comuna donde se originó la falla

Comuna_ID	Nombre Comuna	Provincia	Región
6117	San Vicente	Cachapoal	Región del Libertador

1.5. Reiteración

No hay

2. INSATALACIONES AFECTADAS

SUBESTACIÓN	Interruptor operado	Consumos afectados
San Vicente de Tagua-Tagua	52BT2	Transformador N°2 66/15Kv SE San Vicente de Tagua-Tagua

3. RESUMEN DE OPERACIÓN DE ESQUEMA EDAC DE CONTINGENCIA EXTREMA ZONA DE CACHAPOAL

CONSUMO TOTAL PREVIO A LA OPER. EDAC(MW)	**344 MW**
DESPRENDIMIENTO TOTAL ZONA CACHAPOAL (MW)	**12,86 MW**
DESPRENDIMIENTO ZONA CACHAPOAL (%)	**3,73 %**

Tabla N°1 – Consumos y desprendimiento de EDACxCEx

INFORME (s) CDEC Nº: **IF N° 00035/2016**	FECHA DE FALLA: **07 DE ENERO 2016**
INSTALACIÓN (ES) EDAC CONTINGENCIA EXTREMA SE SAN VICENTE DE TAGUA-TAGUA	

Escalón EDAC	**Ajuste Frecuencia**	**Instalación con EDAC Operado**	**Hora Activación Escalón**	**Hora Desconexión Escalón (Interruptor)**	**Tiempo de operación Escalón (ms)**	**Monto de carga desconectada MW**	**Tasa Variación de frecuencia**	**Hora de recuperación de consumos**
EDAC 1	49,5 Hz & -0.9 Hz/s	SE SAN VICENTE T.T 52BT2	01:13:10.4188	01:13:10.4663	47,5	12,86	-2.217	03:13
					Potencia Total	12,86 (*)		

(*) Nota: Considera 5,32 MW asociados a los circuitos C1, C2, C4 y C5 de SE San Vicente de Tagua-Tagua pertenecientes a CGED, mientras que 7,54 MW asociado al circuito C3 de SE San Vicente de Tagua-Tagua perteneciente a Agrosuper.

Tabla N°2 – Resumen de operación EDACxCEx

INFORME (s) CDEC Nº: **IF N° 00035/2016**	FECHA DE FALLA: **07 DE ENERO 2016**
INSTALACIÓN (ES) EDAC CONTINGENCIA EXTREMA SE SAN VICENTE DE TAGUA-TAGUA	

4. ANÁLISIS DE REGISTROS DE LOS ESQUEMAS DE EDACxCE

4.1. REGISTRO DE FRECUENCIA

Oscilografía Nº1 – Registro de frecuencia (PMV13) y df/dt (PMV18) al momento de la operación del escalón N°1 (canal amarillo) y desconexión de carga (canal morado).

La oscilografía muestran las variables de interés involucradas en la operación del EDACxCEx para analizar el evento. La descripción de cada una de ellas es la siguiente:

- PMV13: Función de cálculo determinista de la frecuencia (evaluada 8 veces por ciclo).
- PMV18: Función de cálculo determinista del dF/dT (evaluada 8 veces por ciclo)
- PSV21: Función lógica involucrada en la activación del Escalón N°1 EDACxCEx SE San Vicente de Tagua-Tagua.
- OUT101 y TRIP: Orden de apertura al interruptor 52T2 de SE San Vicente de Tagua-Tagua.
- IN202 y 3PO: Instante de apertura del interruptor 52BT2 de SE San Vicente de Tagua-Tagua.

INFORME (s) CDEC Nº: **IF N° 00035/2016**	FECHA DE FALLA: **07 DE ENERO 2016**
INSTALACIÓN (ES) EDAC CONTINGENCIA EXTREMA SE SAN VICENTE DE TAGUA-TAGUA	

4.2 ANÁLISIS DE LA OSCILOGRAFÍA N°1

Se observa de la Oscilografía N°1 la activación del escalón N°1 por EDACxCEx en SE San Vicente de Tagua-Tagua a través del elemento auxiliar PSV21, dando orden de TRIP hacia el interruptor 52BT2 de SE San Vicente de Tagua-Tagua (0UT101=1). La frecuencia calculada de forma determinística (PMV13) al momento de la activación es de 49,41 Hz y el gradiente de frecuencia (PMV18) de -2,22 Hz/seg, lo cual cumple con la condición de activación del Escalón N°1 de SE San Vicente de Tagua-Tagua (frecuencia menor a 49,5 Hz y gradiente menor a -0,9 Hz/seg).

Se observa la confirmación de la apertura del interruptor 52BT2 de SE San Vicente de Tagua-Tagua a través de la función IN202=1 y 3PO=1, donde la tasa de frecuencia aumenta a -1,99 Hz/seg y la frecuencia (PMV13) disminuye a 49,33 Hz, continuando con la caída de frecuencia hasta los 48,5 Hz al final del registro.

INFORME (s) CDEC Nº: **IF N° 00035/2016**	FECHA DE FALLA: **07 DE ENERO 2016**
INSTALACIÓN (ES) EDAC CONTINGENCIA EXTREMA SE SAN VICENTE DE TAGUA-TAGUA	

4.3 REGISTROS DE EVENTOS SER RELE SEL-451 EDACxCEx SAN VICENTE DE TAGUA-TAGUA

EDACxCEx
SE SVTT
FID=SEL-451-5-R314-V0-Z019012-D20130618

Date: 01/13/2016 Time: 10:25:10.345
Serial Number: 1132530086

#	DATE	TIME	ELEMENT	STATE
66	01/06/2016	20:07:26.6739	OUT105	ASSERTED
65	01/06/2016	20:07:26.6789	OUT105	DEASSERTED
64	01/06/2016	20:07:26.7214	OUT105	ASSERTED
63	01/06/2016	20:13:09.9188	PCT01Q	ASSERTED
62	01/06/2016	20:13:09.9288	PCT02Q	ASSERTED
61	01/06/2016	20:13:09.9614	PCT03Q	ASSERTED
60	01/06/2016	20:13:10.4188	PSV21	ASSERTED
59	01/06/2016	20:13:10.4188	PSV22	ASSERTED
58	01/06/2016	20:13:10.4188	PSV23	ASSERTED
57	01/06/2016	20:13:10.4188	PCT11Q	ASSERTED
56	01/06/2016	20:13:10.4188	OUT101	ASSERTED
55	01/06/2016	20:13:10.4188	OUT104	ASSERTED
54	01/06/2016	20:13:10.4188	OUT106	ASSERTED
53	01/06/2016	20:13:10.4438	IN201	DEASSERTED
52	01/06/2016	20:13:10.4663	IN202	ASSERTED
51	01/06/2016	20:13:10.4714	PSV23	DEASSERTED
50	01/06/2016	20:13:10.4714	PCT03Q	DEASSERTED
49	01/06/2016	20:13:10.4764	PSV21	DEASSERTED
48	01/06/2016	20:13:10.4764	PSV22	DEASSERTED
47	01/06/2016	20:13:10.4764	PCT01Q	DEASSERTED
46	01/06/2016	20:13:10.4764	PCT02Q	DEASSERTED
45	01/06/2016	20:13:10.4813	PCT11Q	DEASSERTED
44	01/06/2016	20:13:10.5413	PCT11Q	ASSERTED
43	01/06/2016	20:13:10.6163	PSV21	ASSERTED
42	01/06/2016	20:13:10.6163	PCT01Q	ASSERTED
41	01/06/2016	20:13:10.6188	PSV22	ASSERTED
40	01/06/2016	20:13:10.6188	PCT02Q	ASSERTED
39	01/06/2016	20:13:10.6213	PSV23	ASSERTED
38	01/06/2016	20:13:10.6213	PCT03Q	ASSERTED
37	01/06/2016	20:13:10.6263	PSV23	DEASSERTED
36	01/06/2016	20:13:10.6263	PCT03Q	DEASSERTED
35	01/06/2016	20:13:10.7588	PSV22	DEASSERTED
34	01/06/2016	20:13:10.7588	PCT02Q	DEASSERTED
33	01/06/2016	20:13:10.7638	PSV21	DEASSERTED
32	01/06/2016	20:13:10.7638	PCT01Q	DEASSERTED
31	01/06/2016	20:13:10.8188	OUT101	DEASSERTED
30	01/06/2016	20:13:10.8188	OUT104	DEASSERTED
29	01/06/2016	20:13:10.8188	OUT106	DEASSERTED
28	01/06/2016	20:13:10.8963	PSV21	ASSERTED
27	01/06/2016	20:13:10.8963	PCT01Q	ASSERTED
26	01/06/2016	20:13:10.8963	OUT101	ASSERTED
25	01/06/2016	20:13:10.8963	OUT104	ASSERTED
24	01/06/2016	20:13:10.8963	OUT106	ASSERTED
23	01/06/2016	20:13:10.9063	PSV22	ASSERTED
22	01/06/2016	20:13:10.9063	PCT02Q	ASSERTED
21	01/06/2016	20:13:10.9188	PSV22	DEASSERTED
20	01/06/2016	20:13:10.9188	PCT02Q	DEASSERTED
19	01/06/2016	20:13:10.9338	PSV21	DEASSERTED
18	01/06/2016	20:13:10.9338	PCT01Q	DEASSERTED
17	01/06/2016	20:13:11.2963	OUT101	DEASSERTED
16	01/06/2016	20:13:11.2963	OUT104	DEASSERTED
15	01/06/2016	20:13:11.2963	OUT106	DEASSERTED
14	01/06/2016	20:13:20.7438	PCT11Q	DEASSERTED
13	01/06/2016	20:16:57.2263	PCT01Q	ASSERTED
12	01/06/2016	20:16:57.2413	PCT02Q	ASSERTED
11	01/06/2016	20:16:57.2988	PCT02Q	DEASSERTED
10	01/06/2016	20:16:57.3263	PCT01Q	DEASSERTED
9	01/06/2016	20:19:07.2563	OUT105	DEASSERTED
8	01/06/2016	22:11:09.5831	IN202	DEASSERTED
7	01/06/2016	22:11:09.6081	IN201	ASSERTED

INFORME (s) CDEC Nº: **IF N° 00035/2016**	FECHA DE FALLA: **07 DE ENERO 2016**
INSTALACIÓN (ES) EDAC CONTINGENCIA EXTREMA SE SAN VICENTE DE TAGUA-TAGUA	

Del registro de eventos SER se observa que en el registro N°60 se activa el escalón N°1 del EDACxCEx en SE San Vicente tagua-Tagua mediante la variable lógica PSV21, que da orden de TRIP al interruptor 52BT2 a través de la variable OUT101 en el registro N°56. Finalmente en el registro N°52 se muestra la apertura del interruptor con la variable IN202. El tiempo de apertura desde la orden de TRIP hasta que se efectúa la apertura del equipo es de 47,5 ms (Tiempo entre el registro N°56 y N°52).

5. CONCLUSIONES

De acuerdo a los registros oscilográficos y secuenciales expuestos en los puntos anteriores, y en función de la frecuencia y gradiente medido por el relé SEL 451 del paño 52BT2 a la hora de operación del escalón N°1 del EDACxCEx (frecuencia de 49,41 Hz y df/dt -2,22 Hz/seg) se aprecia la correcta operación en función de los umbrales programados para el escalón N°1 (frecuencia de 49,5 Hz y df/dt -0,9 Hz/seg), sin embargo la operación del presente esquema EDACxCEx está diseñado para afrontar una falla y desvinculación del sistema Charrúa – Ancoa en 500 kV. Bajo este concepto se concluye la indeseada operación del esquema EDACxCEx de SE San Vicente de Tagua – Tagua. En el marco de lo anteriormente expuesto, y según lo indicado en comunicaciones oficiales con el CDEC-SIC vía carta UER N°754/2015 (Ver Anexo N°5), Transnet cuenta con una propuesta de mejoras a la lógica de operación y muestreo del relé SEL451 del paño BT2 de SE San Vicente de Tagua - Tagua confeccionada por la empresa TECMA (desarrollador del presente esquema EDACxCEx), las cuales considera incorporación de ecuaciones que generan mayor seguridad ante la detección de componentes de secuencia negativa y directa, utilización del ángulo del fasor de secuencia positiva para el cálculo del ángulo entre otras.

Las pruebas efectivas de dichas mejoras en los laboratorios de TECMA, según lo indicado por la carta UER N°754/2015 y disponibilidad de la empresa TECMA está coordinada para la segunda semana de Febrero del 2016, donde participarán especialistas de Transnet para emitir una versión final del ajuste, lo cual será comunicado oportunamente a través de los medios habituales a la DO del CDEC-SIC. La implementación final de las mejoras se tiene planificada para el primer semestre del 2016 en los relés EDACxCEx de Transnet.

INFORME (s) CDEC Nº: **IF N° 00035/2016**	FECHA DE FALLA: **07 DE ENERO 2016**
INSTALACIÓN (ES) EDAC CONTINGENCIA EXTREMA SE SAN VICENTE DE TAGUA-TAGUA	

6. ANÁLISIS CONJUNTO

El día Jueves 07 de Enero de 2016, a las 01:13 hrs se produce la operación del esquema EDAC por contingencias extremas en Transformador N°2 de SE San Vicente de Tagua-Tagua producto de una falla en las líneas 154KV Tinguiririca – Rancagua – Alto Jahuel N°1 y N°2, propiedad de Transelec, con una potencia total interrumpida de 12,86 MW.

Posteriormente en coordinación con el CDC del CDEC-SIC se procede a normalizar las SE afectadas, recuperando la totalidad de los consumos operados por el presente EDAC a las 03:13 hrs.

INFORME (s) CDEC Nº: **IF N° 00035/2016**	FECHA DE FALLA: **07 DE ENERO 2016**
INSTALACIÓN (ES) EDAC CONTINGENCIA EXTREMA SE SAN VICENTE DE TAGUA-TAGUA	

ANEXO N°1

ESTAMPA DE TIEMPO SINCRONIZADA

INFORME (s) CDEC Nº: **IF N° 00035/2016**	FECHA DE FALLA: **07 DE ENERO 2016**
INSTALACIÓN (ES) EDAC CONTINGENCIA EXTREMA SE SAN VICENTE DE TAGUA-TAGUA	

S/E San Vicente de T.T

Eventos

Fecha Inicio:	1/7/2016	Fecha Termino:	1/7/2016
Hora Inicio:	00:00:00.000	Hora Termino:	23:00:00:000
Zona:	Rancagua	SE:	San Vicente de TT

SE	Fecha	Hora	Estado	Descripcion
San Vicente de TT	2016/01/07	01:07:26.726	1	SVicente_ALM_ReléSEL321_52B4_PérdPoten
San Vicente de TT	2016/01/07	01:13:10.461	1	SVicente_66_ST_Abierto_52BT2
San Vicente de TT	2016/01/07	01:13:10.461	1	SVicente_ALM_Apertura_52BT2
San Vicente de TT	2016/01/07	03:10:35.152	1	SVicente_15_ST_Abierto_52CT2
San Vicente de TT	2016/01/07	03:10:35.153	1	SVicente_ALM_Apertura_52CT2
San Vicente de TT	2016/01/07	03:11:09.576	0	SVicente_ALM_Apertura_52BT2
San Vicente de TT	2016/01/07	03:11:09.602	1	SVicente_66_ST_Cerrado_52BT2
San Vicente de TT	2016/01/07	03:13:26.702	0	SVicente_ALM_Apertura_52CT2
San Vicente de TT	2016/01/07	03:13:26.718	1	SVicente_15_ST_Cerrado_52CT2

INFORME (s) CDEC Nº: **IF N° 00035/2016**	FECHA DE FALLA: **07 DE ENERO 2016**
INSTALACIÓN (ES) EDAC CONTINGENCIA EXTREMA SE SAN VICENTE DE TAGUA-TAGUA	

ANEXO N°2

Setting relé SEL-451
ESQUEMA EDACxCE SSEE SAN VICENTE TT

INFORME (s) CDEC Nº: **IF N° 00035/2016**	FECHA DE FALLA: **07 DE ENERO 2016**
INSTALACIÓN (ES) EDAC CONTINGENCIA EXTREMA SE SAN VICENTE DE TAGUA-TAGUA	

SSEE SAN VICENTE

```
EDACxCEx                                    Date: 01/09/2015  Time: 05:49:01.778
SE SVTT                                     Serial Number: 1132530086

Level 1

=>SHO□□□DATE□□□□SHO
Group 1

Line Configuration

CTRW    := 40       CTRX    := 40       PTRY    := 600.0    VNOMY   := 120
PTRZ    := 600.0    VNOMZ   := 120      Z1MAG   := 10.00    Z1ANG   := 90.00
Z0MAG   := 10.00    Z0ANG   := 90.00    EFLOC   := N

Relay Configuration

ESOTF   := N        ELOAD   := N        E50P    := N        E50G    := N
E50Q    := N        E51S    := N        E59     := N        E27     := N
E81     := 1        E32     := N        ECOMM   := N        EBFL1   := N
E25BK1  := N        E79     := N        EMANCL  := N        ELOP    := Y
EDEM    := THM      EXFMRHB := N        EADVS   := Y
VMEMC   := 0


81 Elements

81UVSP  := 50.00    81D1P   := 49.70    81D1D   := 0.20

Pole Open Detection

EPO     := 52       3POD    := 0.500

Demand Metering

DMTC    := 15       PDEMP   := OFF      GDEMP   := OFF      QDEMP   := OFF


Trip Logic

TR      := PLT32 AND PSV21
BK1MTR  := NA
ULTR    := IN202
ULMTR1  := NA
TULO    := 3        TDUR3D  := 20.000
ER      := PSV21 OR PSV22 OR PSV23 OR 81D1UDR

=>SHO S
Group 1

Line Configuration

CTRW    := 40       CTRX    := 40       PTRY    := 600.0    VNOMY   := 120
PTRZ    := 600.0    VNOMZ   := 120      Z1MAG   := 10.00    Z1ANG   := 90.00
Z0MAG   := 10.00    Z0ANG   := 90.00    EFLOC   := N

Relay Configuration

ESOTF   := N        ELOAD   := N        E50P    := N        E50G    := N
```

INFORME (s) CDEC Nº: **IF N° 00035/2016**	FECHA DE FALLA: **07 DE ENERO 2016**
INSTALACIÓN (ES) EDAC CONTINGENCIA EXTREMA SE SAN VICENTE DE TAGUA-TAGUA	

```
E50Q    := N        E51S    := N        E59     := N        E27     := N
E81     := 1        E32     := N        ECOMM   := N        EBFL1   := N
E25BK1  := N        E79     := N        EMANCL  := N        ELOP    := Y
EDEM    := THM      EXFMRHB := N        EADVS   := Y
VMEMC   := 0


81 Elements

81UVSP  := 50.00    81D1P   := 49.70    81D1D   := 0.20

Pole Open Detection

EPO     := 52       3POD    := 0.500

Demand Metering

DMTC    := 15       PDEMP   := OFF      GDEMP   := OFF      QDEMP   := OFF


Trip Logic

TR      := PLT32 AND PSV21
BK1MTR  := NA
ULTR    := IN202
ULMTR1  := NA
TULO    := 3        TDUR3D  := 20.000
ER      := PSV21 OR PSV22 OR PSV23 OR 81D1UDR

=>SHO A
Automation 1

1: AMV001 := IAXM * 600.000000
2: AMV002 := VAZM * 100.000000
3: AMV003 := ((VABYM + VBCYM + VCAYM) / 3.000000) * 0.100000
4: AMV004 := ((IAWM + IBWM + ICWM) / 3.000000) * 600.000000
5: AMV005 := 3PF * 100.000000
6: ALT01S := TRIP # PARA LED 1 - TRIP ESCALON 1
7: ALT01R := PCT04Q
8: ALT02S := PSV21 # PARA LED 2 - ESCALON 1
9: ALT02R := PCT04Q
10: ALT03S := PSV22 # PARA LED 3 - ESCALON 2
11: ALT03R := PCT04Q
12: ALT04S := PSV23 # PARA LED 4 - ESCALON 3
13: ALT04R := PCT04Q

=>SHO D
DNP 1

DNP Object Default Map Enables

MINDIST := OFF      MAXDIST := OFF

Binary Input Map
(Binary Input Label)

1: RLYDIS
2: TRIPLED
3: STFAIL
4: STWARN
5: STSET
```

INFORME (s) CDEC Nº: **IF N° 00035/2016**	FECHA DE FALLA: **07 DE ENERO 2016**
INSTALACIÓN (ES) EDAC CONTINGENCIA EXTREMA SE SAN VICENTE DE TAGUA-TAGUA	

6: SALARM
7: HALARM
8: BADPASS
9: UNRDEV
10: 3PO
11: BK1RS
12: BK2RS
13: BK1LO
14: BK2LO
15: 52AA1
16: 52AB1
17: 52AC1
18: 52AAL1
19: 52AA2
20: 52AB2
21: 52AC2
22: 52AAL2
23: TLED_1
24: TLED_2
25: COMM
26: SOTF
27: NEG_SEQ
28: 79_RST
29: 79_CYC
30: 79_LO
31: A_FAULT
32: B_FAULT
33: C_FAULT
34: GND
35: LOPTN
36: VAY_ON
37: VBY_ON
38: VCY_ON
39: LDATPFW
40: LDBTPFW
41: LDCTPFW
42: LD3TPFW
43: IN101
44: IN102
45: IN103
46: IN104
47: IN105
48: IN106
49: IN107
50: PSV01
51: PSV02
52: PSV03
53: PSV04
54: PSV05
55: PSV06
56: PSV07
57: PSV08
58: ASV001
59: ASV002
60: ASV003
61: ASV004
62: ASV005
63: ASV006
64: ASV007
65: ASV008
66: OUT101

INFORME (s) CDEC Nº: **IF N° 00035/2016**	FECHA DE FALLA: **07 DE ENERO 2016**
INSTALACIÓN (ES) EDAC CONTINGENCIA EXTREMA SE SAN VICENTE DE TAGUA-TAGUA	

67: OUT102
68: OUT103
69: OUT104
70: OUT105
71: OUT106
72: OUT107

Binary Output Map
(Binary Output Label)

1: RB01
2: RB02
3: RB03
4: RB04
5: RB05
6: RB06
7: RB07
8: RB08
9: RB09
10: RB10
11: RB11
12: RB12
13: RB13
14: RB14
15: RB15
16: RB16
17: RB17
18: RB18
19: RB19
20: RB20
21: RB21
22: RB22
23: RB23
24: RB24
25: RB25
26: RB26
27: RB27
28: RB28
29: RB29
30: RB30
31: RB31
32: RB32
33: OC1
34: CC1
35: OC2
36: CC2
37: 89OC01
38: 89CC01
39: 89OC02
40: 89CC02
41: 89OC03
42: 89CC03
43: 89OC04
44: 89CC04
45: 89OC05
46: 89CC05
47: 89OC06
48: 89CC06
49: 89OC07
50: 89CC07

INFORME (s) CDEC Nº: **IF N° 00035/2016**	FECHA DE FALLA: **07 DE ENERO 2016**
INSTALACIÓN (ES) EDAC CONTINGENCIA EXTREMA SE SAN VICENTE DE TAGUA-TAGUA	

51: 89OC08
52: 89CC08
53: 89OC09
54: 89CC09
55: 89OC10
56: 89CC10
57: RST_DEM
58: RST_PDM
59: RST_ENE
60: RST_BK1
61: RST_BK2
62: RSTTRGT
63: RSTMML
64: RSTDNPE

Counter Map
(Counter Label, Deadband)

1: ACTGRP
2: BKR1OPA
3: BKR1OPB
4: BKR1OPC
5: BKR2OPA
6: BKR2OPB
7: BKR2OPC

Analog Input Map
(Analog Input Label, Scale Factor, Deadband)

1: LIAFM
2: LIAFA
3: LIBFM
4: LIBFA
5: LICFM
6: LICFA
7: B1IAFM
8: B1IAFA
9: B1IBFM
10: B1IBFA
11: B1ICFM
12: B1ICFA
13: B2IAFM
14: B2IAFA
15: B2IBFM
16: B2IBFA
17: B2ICFM
18: B2ICFA
19: VAFM
20: VAFA
21: VBFM
22: VBFA
23: VCFM
24: VCFA
25: VPM
26: NVS1M
27: NVS2M
28: LIGM
29: LIGA
30: LI1M

INFORME (s) CDEC Nº: **IF N° 00035/2016**	FECHA DE FALLA: **07 DE ENERO 2016**
INSTALACIÓN (ES) EDAC CONTINGENCIA EXTREMA SE SAN VICENTE DE TAGUA-TAGUA	

```
31: LI1A
32: L3I2M
33: L3I2A
34: 3V0M
35: 3V0A
36: V1M
37: V1A
38: 3V2M
39: 3V2A
40: PA_F
41: PB_F
42: PC_F
43: 3P_F
44: QA_F
45: QB_F
46: QC_F
47: 3Q_F
48: DPFA
49: DPFB
50: DPFC
51: 3DPF
52: DC1
53: DC2
54: FREQ
55: MWHAIN
56: MWHAOUT
57: MWHBIN
58: MWHBOUT
59: MWHCIN
60: MWHCOUT
61: 3MWHIN
62: 3MWHOUT
63: IAD
64: IBD
65: ICD
66: IGD
67: 3I2D
68: PAD
69: PBD
70: PCD
71: 3PD
72: IAPKD
73: IBPKD
74: ICPKD
75: IGPKD
76: 3I2PKD
77: PAPKD
78: PBPKD
79: PCPKD
80: 3PPKD
81: B1BCWPA
82: B1BCWPB
83: B1BCWPC
84: B2BCWPA
85: B2BCWPB
86: B2BCWPC
87: FTYPE, , 0
88: FTAR1, , 0
89: FTAR2, , 0
90: FSLOC, , 0
91: FCURR, , 0
```

INFORME (s) CDEC Nº: **IF N° 00035/2016**	FECHA DE FALLA: **07 DE ENERO 2016**
INSTALACIÓN (ES) EDAC CONTINGENCIA EXTREMA SE SAN VICENTE DE TAGUA-TAGUA	

```
92: FFREQ, , 0
93: FGRP, , 0
94: FTIMEUH, , 0
95: FTIMEUM, , 0
96: FTIMEUL, , 0
97: FSHOT1, , 0
98: FSHOT2, , 0
99: FUNR, , 0
100: SHOT3_T
101: RLYTEMP


Analog Output Map
(Analog Output Label)

1: ACTGRP

=> SHO F
Front Panel

Front Panel Settings

FP_TO   := 15
PB1_LED := PLT32
PB2_LED := NOT PLT32
PB3_LED := 0
PB4_LED := 0
PB5_LED := 0
PB6_LED := 0
PB7_LED := 0
PB8_LED := PCT31Q
T1_LED  := ALT01
T1LEDL  := N
T2_LED  := ALT02
T2LEDL  := N
T3_LED  := ALT03
T3LEDL  := N
T4_LED  := ALT04
T4LEDL  := N
T5_LED  := PSV28
T5LEDL  := N
T6_LED  := PSV29
T6LEDL  := N
T7_LED  := NOT TSOK
T7LEDL  := N
T8_LED  := NOT PLT32
T8LEDL  := N
T9_LED  := 0
T9LEDL  := N
T10_LED := 0
T10LEDL := N
T11_LED := 0
T11LEDL := N
T12_LED := 0
T12LEDL := N
T13_LED := 0
T13LEDL := N
T14_LED := 0
T14LEDL := N
T15_LED := 0
T15LEDL := N
```

INFORME (s) CDEC Nº: **IF N° 00035/2016**	FECHA DE FALLA: **07 DE ENERO 2016**
INSTALACIÓN (ES) EDAC CONTINGENCIA EXTREMA SE SAN VICENTE DE TAGUA-TAGUA	

```
T16_LED := 0
T16LEDL := N

Selectable Screens for the Front Panel

SCROLD  := 5        ONELINE := N        RMS_V   := Y        RMS_I   := Y
RMS_VPP := Y        RMS_W   := Y        FUNDVAR := N        RMS_VA  := N
RMS_PF  := N        RMS_BK1 := N        RMS_BK2 := N        STA_BAT := N
FUND_VI := N        FUNDSEQ := N        FUND_BK := N

Selectable Operator Pushbuttons

PB1_HMI := OFF      PB2_HMI := OFF      PB3_HMI := OFF      PB4_HMI := OFF
PB5_HMI := OFF      PB6_HMI := OFF      PB7_HMI := OFF      PB8_HMI := OFF


Front Panel Event Display

DISP_ER := Y        TYPE_ER := ALL

Display Points and Aliases
(Boolean):RWB Name, "Label", "Set String", "Clear String", "Text Size"
(Analog) : Analog Quantity Name, "User Text and Formatting", "Text Size"



Local Control
(Local Bit, Local Label, Local Set State, Local Clear State, Pulse Enable)



SER Parameters

SER_PP  := N
=>

=>SHO G
Global

General Global Settings

SID     := "SE SVTT"
RID     := "EDACxCEx"
NUMBK   := 1
BID1    := "52BT2"
NFREQ   := 50       PHROT   := ABC
FAULT   := NA


Global Enables

EDCMON  := 1        EICIS   := Y        EDRSTC  := N        EGADVS  := Y
EPMU    := Y

Station DC1 Monitor

DC1LFP  := OFF      DC1LWP  := OFF      DC1HWP  := 38       DC1HFP  := 43
DC1RP   := 9        DC1GF   := 1.05

Control Inputs
```

INFORME (s) CDEC Nº: **IF N° 00035/2016**	FECHA DE FALLA: **07 DE ENERO 2016**
INSTALACIÓN (ES) EDAC CONTINGENCIA EXTREMA SE SAN VICENTE DE TAGUA-TAGUA	

```
GINDF   := 80

Main Board Control Inputs

IN101PU := 0.0000   IN101DO := 0.0000   IN102PU := 0.0000   IN102DO := 0.0000
IN103PU := 0.0000   IN103DO := 0.0000   IN104PU := 0.0000   IN104DO := 0.0000
IN105PU := 0.0000   IN105DO := 0.0000   IN106PU := 0.0000   IN106DO := 0.0000
IN107PU := 0.0000   IN107DO := 0.0000

Interface Board # 1 Control Inputs

IN201P  := 30       IN202P  := 30       IN203P  := 30       IN204P  := 30
IN205P  := 30       IN206P  := 30       IN207P  := 30       IN208P  := 30
IN201PU := 0.1250   IN201DO := 0.1250   IN202PU := 0.1250   IN202DO := 0.1250
IN203PU := 0.1250   IN203DO := 0.1250   IN204PU := 0.1250   IN204DO := 0.1250
IN205PU := 0.1250   IN205DO := 0.1250   IN206PU := 0.1250   IN206DO := 0.1250
IN207PU := 0.1250   IN207DO := 0.1250   IN208PU := 0.1250   IN208DO := 0.1250


Settings Group Selection

SS1     := 1
SS2     := 0
SS3     := 0
SS4     := 0
SS5     := 0
SS6     := 0
TGR     := 180

Frequency Estimation

EAFSRC  := 0
VF01    := ZERO     VF02    := ZERO     VF03    := ZERO     VF11    := ZERO
VF12    := ZERO     VF13    := ZERO

Time-Error Calculation

STALLTE := NA
LOADTE  := NA


Current and Voltage Source Selection

ESS     := N

Synchronized Phasor Configuration Settings

MFRMT   := C37.118  MRATE   := 2        PMAPP   := N        NUMPHDC := 1


Synchrophasor Data Configuration 1

PMSTN1  := "STATION A"
PMID1   := 1


Phasors Included in the Data 1

Terminal Name, Relay Word Bit, Alternate Terminal Name

FNR1    := I
```

INFORME (s) CDEC Nº: **IF N° 00035/2016**	FECHA DE FALLA: **07 DE ENERO 2016**
INSTALACIÓN (ES) EDAC CONTINGENCIA EXTREMA SE SAN VICENTE DE TAGUA-TAGUA	

```
Synchrophasor Analog Quantities in Data Configuration 1
(Maximum 16 Analog Quantities)


Synchrophasor Digitals in Data Configuration 1
(Maximum 64 Digitals)


TREA1   := NA
TREA2   := NA
TREA3   := NA
TREA4   := NA
PMTRIG  := NA
PMTEST  := NA
PHCOMP  := Y

Synchronized Phasor Recorder Settings

EPMDR   := N

Synchronized Phasor Real Time Control Settings

RTCRATE := 2        MRTCDLY := 500

Time and Date Management

DATE_F  := MDY      IRIGC   := C37.118  UTCOFF  := -8.0
BEG_DST := "2,2,1,3"
END_DST := "2,1,1,11"


DNP

EVELOCK := 0        DNPSRC  := UTC
=>

=>

=>SHO L
Protection 1

1: PSV60 := VAFIM > 50.000000 # VOLTAJE MAYOR QUE 50 VOLTS
2: PMV01 := PMV02
3: PMV02 := PMV03
4: PMV03 := PMV04
5: PMV04 := PMV05
6: PMV05 := PMV06
7: PMV06 := PMV07
8: PMV07 := PMV08
9: PMV08 := PMV09 # MEMORIA Y ARCHIVO DE LAS ULTIMAS 8 MEDIDAS
10: PMV09 := ((VAYA * PCT32Q) + (VAZA * NOT PCT32Q)) * PSV60 # MEDIDA \
            ACTUAL DEL ANGULO DE LA TENSION Y CONFIRMACION DE VOLTAJE \
            SOBRE 50 V
11: #
12: PMV11 := PMV09 - PMV01 # DIFERENCIA DE ANGULO 1 CICLO DESPUES
13: PMV10 := 0.000000 - 180.000000
14: PSV61 := (PMV11 > 180.000000)
15: PSV62 := PMV11 < PMV10
```

INFORME (s) CDEC Nº: **IF N° 00035/2016**	FECHA DE FALLA: **07 DE ENERO 2016**
INSTALACIÓN (ES) EDAC CONTINGENCIA EXTREMA SE SAN VICENTE DE TAGUA-TAGUA	

```
16: PMV11 := PMV11 - (360.000000 * PSV61) + (360.000000 * PSV62) # EL \
          ANGULO ENTRE -180 Y 180 GRADOS
17: # FRECUENCIA
18: PMV12 := FREQ * (1.000000 + PMV11 / 360.000000) # ECUACION DE LA \
          FRECUENCIA + DELTA FRECUENCIA
19: # FILTRO
20: PMV13 := (7.000000 / 8.000000) * PMV13 + (1.000000 / 8.000000) * PMV12
21: # DFDT
22: PMV21 := PMV22
23: PMV22 := PMV23
24: PMV23 := PMV24
25: PMV24 := PMV25
26: PMV25 := PMV26
27: PMV26 := PMV27
28: PMV27 := PMV28
29: PMV28 := PMV29
30: PMV29 := PMV13
31: PMV16 := PMV29 - PMV21
32: PMV17 := PMV16 * FREQ #    DELTA FRECUENCIA / DELTA T
33: PMV18 := (7.000000 / 8.000000) * PMV18 + (1.000000 / 8.000000) * \
          PMV17 #   FILTRO PARA EL DF/DT
34: #
35: # ESCALON 1
36: #
37: PMV31 := -0.900000 # - 0.9 HZ / SEG
38: PMV41 := 0.950000 * PMV31
39: PLT01S := PMV18 < PMV31
40: PLT01R := PMV18 > PMV41
41: PCT01PU := 5.000000 # DELAY 100 MSEG
42: PCT01IN := PLT01
43: PSV11 := PMV13 < 49.500000
44: PCT11PU := 2.000000
45: PCT11IN := PSV11
46: PSV21 := PCT01Q AND PCT11Q AND PSV60
47: #
48: # ESCALON 2
49: #
50: PMV32 := -1.200000 # - 1.2 HZ / SEG
51: PMV42 := 0.950000 * PMV32
52: PLT02S := PMV18 < PMV32
53: PLT02R := PMV18 > PMV42
54: PCT02PU := 5.000000 # DELAY 100 MSEG
55: PCT02IN := PLT02
56: PSV22 := PCT02Q AND PCT11Q AND PSV60
57: #
58: # ESCALON 3
59: #
60: PMV33 := -1.900000 # - 1.9 HZ / SEG
61: PMV43 := 0.950000 * PMV33
62: PLT03S := PMV18 < PMV33
63: PLT03R := PMV18 > PMV43
64: PCT03PU := 5.000000 # DELAY 100 MSEG
65: PCT03IN := PLT03
66: PSV23 := PCT03Q AND PCT11Q AND PSV60
67: #
68: PCT32PU := 250.000000
69: PCT32DO := 250.000000
70: PCT32IN := VAYM > 20.000000 AND VBYM > 20.000000 AND VCYM > 20.000000
71: #
72: #PANEL FRONTAL
73: #
```

INFORME (s) CDEC Nº: **IF N° 00035/2016**	FECHA DE FALLA: **07 DE ENERO 2016**
INSTALACIÓN (ES) EDAC CONTINGENCIA EXTREMA SE SAN VICENTE DE TAGUA-TAGUA	

```
74: PST01IN := PB8
75: PST01PT := 150.000000
76: PST01R := R_TRIG PB8
77: PCT31IN := R_TRIG PST01Q
78: PCT31PU := 0.000000
79: PCT31DO := 1000.000000
80: PLT32S := PB1_PUL AND PCT31Q
81: PLT32R := PB2_PUL AND PCT31Q # ECUACIONES EDAC ON-OFF POR PANEL FRONTAL
82: #
83: #ALARMAS PERDIDA DE POTENCIAL
84: #
85: PSV24 := VAYM < 20.000000 OR VBYM < 20.000000 OR VCYM < 20.000000 # VY \
           CON AL MENOS UN POTENCIAL MENOS
86: PSV25 := VAYM > 20.000000 AND VBYM > 20.000000 AND VCYM > 20.000000 # \
           VY CON AL MENOS UN PORTENCIAL OK
87: PSV26 := VAZM < 20.000000 OR VBZM < 20.000000 OR VCZM < 20.000000 # VZ \
           CON AL MENOS UN POTENCIAL MENOS
88: PSV27 := VAZM > 20.000000 AND VBZM > 20.000000 AND VCZM > 20.000000 # \
           VZ CON AL MENOS UN PORTENCIAL OK
89: PSV28 := PSV24 AND PSV27 #CONDICION ALARMA PERD POT PRINCIPAL
90: PSV29 := PSV26 AND PSV25 #CONDICION ALARMA PERD POT SECUNDARIO
91: #
92: PCT04IN := TRGTR
93: PCT04PU := 0.000000
94: PCT04DO := 100.000000

=>

=>SHO M
Breaker Monitor

Enables

EB1MON  := N        EVSSI   := N

Breaker 1 Inputs

52AA1   := IN201

=>

=>SHO O
Output

Main Board

OUT101  := TRIP #TRIP 52BT2
OUT102  := NA
OUT103  := NA
OUT104  := TRIP #EDAC OPERADO
OUT105  := PSV28 OR PSV29 OR NOT TSOK #PERDIDA DE POTENCIALES O IRIGB
OUT106  := TRIP #EDACXCEX ESCALON_1
OUT107  := PLT32 # ESQUEMA HAB-DESHAB
OUT108  := NOT (SALARM OR HALARM)


Interface Board #1

OUT201  := NA
OUT202  := NA
OUT203  := NA
```

```
OUT204  := NA
OUT205  := NA
OUT206  := NA
OUT207  := NA
OUT208  := NA
OUT209  := NA
OUT210  := NA
OUT211  := NA
OUT212  := NA
OUT213  := NA
OUT214  := NA
OUT215  := NA


Mirrored Bits Transmit Equations

TMB1A   := NA
TMB2A   := NA
TMB3A   := NA
TMB4A   := NA
TMB5A   := NA
TMB6A   := NA
TMB7A   := NA
TMB8A   := NA
TMB1B   := NA
TMB2B   := NA
TMB3B   := NA
TMB4B   := NA
TMB5B   := NA
TMB6B   := NA
TMB7B   := NA
TMB8B   := NA

=>

=>SHO P
Port F

Protocol Selection

EPORT   := Y        PROTO   := SEL

Communications Settings

SPEED   := 38400    DATABIT := 8        PARITY  := N        STOPBIT := 1
RTSCTS  := N

SEL Protocol Settings

TIMEOUT := 15       AUTO    := N        FASTOP  := Y        TERTIM1 := 1
TERSTRN := "\005"
TERTIM2 := 0

Fast Message Read Data Access

FMRENAB := Y        FMRLCL  := N        FMRMTR  := Y        FMRDMND := Y
FMRTAR  := Y        FMRHIS  := N        FMRBRKR := N        FMRSTAT := N
FMRANA  := Y
=>

=>
```

INFORME (s) CDEC Nº: **IF N° 00035/2016**	FECHA DE FALLA: **07 DE ENERO 2016**
INSTALACIÓN (ES) EDAC CONTINGENCIA EXTREMA SE SAN VICENTE DE TAGUA-TAGUA	

```
=>SHO R
Report

SER Chatter Criteria

ESERDEL := N

SER Points
(Relay Word Bit, Reporting Name, Set State Name, Clear State Name, HMI Alarm)

1: PSV01,"PSV01","ASSERTED","DEASSERTED",N
2: PSV02,"PSV02","ASSERTED","DEASSERTED",N
3: PSV03,"PSV03","ASSERTED","DEASSERTED",N
4: PSV04,"PSV04","ASSERTED","DEASSERTED",N
5: PSV05,"PSV05","ASSERTED","DEASSERTED",N
6: PSV06,"PSV06","ASSERTED","DEASSERTED",N
7: PSV07,"PSV07","ASSERTED","DEASSERTED",N
8: PSV08,"PSV08","ASSERTED","DEASSERTED",N
9: PSV20,"PSV20","ASSERTED","DEASSERTED",N
10: PSV21,"PSV21","ASSERTED","DEASSERTED",N
11: PSV22,"PSV22","ASSERTED","DEASSERTED",N
12: PSV23,"PSV23","ASSERTED","DEASSERTED",N
13: PSV24,"PSV24","ASSERTED","DEASSERTED",N
14: PSV25,"PSV25","ASSERTED","DEASSERTED",N
15: PCT01Q,"PCT01Q","ASSERTED","DEASSERTED",N
16: PCT02Q,"PCT02Q","ASSERTED","DEASSERTED",N
17: PCT03Q,"PCT03Q","ASSERTED","DEASSERTED",N
18: PCT04Q,"PCT04Q","ASSERTED","DEASSERTED",N
19: PCT31Q,"PCT31Q","ASSERTED","DEASSERTED",N
20: PCT32Q,"PCT32Q","ASSERTED","DEASSERTED",N
21: TSOK,"TSOK","ASSERTED","DEASSERTED",N
22: PCT21Q,"PCT21Q","ASSERTED","DEASSERTED",N
23: PCT22Q,"PCT22Q","ASSERTED","DEASSERTED",N
24: PCT23Q,"PCT23Q","ASSERTED","DEASSERTED",N
25: PCT24Q,"PCT24Q","ASSERTED","DEASSERTED",N
26: PCT25Q,"PCT25Q","ASSERTED","DEASSERTED",N
27: PCT11Q,"PCT11Q","ASSERTED","DEASSERTED",N
28: OUT101,"OUT101","ASSERTED","DEASSERTED",N
29: OUT102,"OUT102","ASSERTED","DEASSERTED",N
30: OUT103,"OUT103","ASSERTED","DEASSERTED",N
31: OUT104,"OUT104","ASSERTED","DEASSERTED",N
32: OUT105,"OUT105","ASSERTED","DEASSERTED",N
33: OUT106,"OUT106","ASSERTED","DEASSERTED",N
34: OUT107,"OUT107","ASSERTED","DEASSERTED",N
35: OUT108,"OUT108","ASSERTED","DEASSERTED",N
36: IN201,"IN201","ASSERTED","DEASSERTED",N
37: IN202,"IN202","ASSERTED","DEASSERTED",N
38: PSV60,"PSV60","ASSERTED","DEASSERTED",N
39: TRGTR,"TRGTR","ASSERTED","DEASSERTED",N
40: PLT32,"PLT32","ASSERTED","DEASSERTED",N
41: 81D1UDR,"F<49,7HZ","ASSERTED","DEASSERTED",N


Signal Profile
(Maximum 20 Analog Quantities)


Event Reporting
```

INFORME (s) CDEC Nº: **IF N° 00035/2016**	FECHA DE FALLA: **07 DE ENERO 2016**
INSTALACIÓN (ES) EDAC CONTINGENCIA EXTREMA SE SAN VICENTE DE TAGUA-TAGUA	

```
SRATE   := 2        LER     := 2.00     PRE     := 1.00

Event Reporting Analog Quantities
(Maximum 20 Analog Quantities)

1: PMV11
2: PMV12
3: PMV13
4: PMV16
5: PMV17
6: PMV18
7: PMV29
8: PMV31
9: FREQPM
10: DFDTPM
11: FREQ
12: FREQP
13: DFDTP


Event Reporting Digital Elements
(800 Relay Word Bits Maximum from 100 Rows Maximum)

1: T3P1
2: T3P2
3: #
4: VPOLV
5: ZLOAD
6: LOP
7: #
8: F32P
9: R32P
10: 81D1UDR
11: 32QF
12: 32QR
13: 32VE
14: 32GF
15: 32GR
16: #
17: SOTFT
18: #
19: 50P1
20: 50P2
21: 67P1
22: 67P2
23: 67P1T
24: 67P2T
25: #
26: 50G1
27: 50G2
28: 67G1
29: 67G2
30: 67G1T
31: 67G2T
32: #
33: 50Q1
34: 50Q2
35: 67Q1
36: 67Q2
37: 67Q1T
38: 67Q2T
```

INFORME (s) CDEC Nº: **IF N° 00035/2016**	FECHA DE FALLA: **07 DE ENERO 2016**
INSTALACIÓN (ES) EDAC CONTINGENCIA EXTREMA SE SAN VICENTE DE TAGUA-TAGUA	

```
39: #
40: 51S1
41: 51S1T
42: 51S1R
43: #
44: 51S2
45: 51S2T
46: 51S2R
47: #
48: 51S3
49: 51S3T
50: 51S3R
51: #
52: BK1RS
53: BK1LO
54: BK1CL
55: BK1CFT
56: BFTRIP1
57: #
58: BK2RS
59: BK2LO
60: BK2CL
61: BK2CFT
62: BFTRIP2
63: #
64: 79CY3
65: 3PSHOT0
66: 3PSHOT1
67: 3PSHOT2
68: 3PSHOT3
69: 3PSHOT4
70: #
71: 25A1BK1
72: 25A1BK2
73: #
74: 52AA1
75: 52AA2
76: 3PO
77: #
78: #
79: IN101
80: IN102
81: IN103
82: IN104
83: IN105
84: IN106
85: IN107
86: #
87: OUT101
88: OUT102
89: OUT103
90: OUT104
91: OUT105
92: OUT106
93: OUT107
94: OUT108
95: #
96: RMB1A
97: RMB2A
98: RMB3A
99: RMB4A
```

INFORME (s) CDEC Nº: **IF N° 00035/2016**	FECHA DE FALLA: **07 DE ENERO 2016**
INSTALACIÓN (ES) EDAC CONTINGENCIA EXTREMA SE SAN VICENTE DE TAGUA-TAGUA	

```
100: RMB5A
101: RMB6A
102: RMB7A
103: RMB8A
104: #
105: TMB1A
106: TMB2A
107: TMB3A
108: TMB4A
109: TMB5A
110: TMB6A
111: TMB7A
112: TMB8A
113: #
114: ROKA
115: RBADA
116: CBADA
117: LBOKA
118: ANOKA
119: DOKA
120: #
121: PSV01
122: PSV02
123: PSV03
124: PSV04
125: PSV05
126: PSV06
127: PSV07
128: PSV08
129: #
130: PLT01
131: PLT02
132: PLT03
133: PLT04
134: PLT05
135: PLT06
136: PLT07
137: PLT08
138: #
139: PCT01Q
140: PCT02Q
141: PCT03Q
142: PCT04Q
143: PCT05Q
144: PCT06Q
145: PCT07Q
146: PCT08Q
147: #
148: PT
149: Z3RB
150: KEY
151: COMPRM
152: #
153: PB7
154: PB8
155: CC1
156: OC1
157: PSV16
158: PSV15
159: PSV14
160: PSV13
```

INFORME (s) CDEC Nº: **IF N° 00035/2016**	FECHA DE FALLA: **07 DE ENERO 2016**
INSTALACIÓN (ES) EDAC CONTINGENCIA EXTREMA SE SAN VICENTE DE TAGUA-TAGUA	

161: PSV12
162: PSV11
163: PSV10
164: PSV09
165: PSV24
166: PSV23
167: PSV22
168: PSV21
169: PSV20
170: PSV19
171: PSV18
172: PSV17
173: PSV32
174: PSV31
175: PSV30
176: PSV29
177: PSV28
178: PSV27
179: PSV26
180: PSV25
181: PSV40
182: PSV39
183: PSV38
184: PSV37
185: PSV36
186: PSV35
187: PSV34
188: PSV33
189: PSV48
190: PSV47
191: PSV46
192: PSV45
193: PSV44
194: PSV43
195: PSV42
196: PSV41
197: PSV56
198: PSV55
199: PSV54
200: PSV53
201: PSV52
202: PSV51
203: PSV50
204: PSV49
205: PSV64
206: PSV63
207: PSV62
208: PSV61
209: PSV60
210: PSV59
211: PSV58
212: PSV57
213: PLT16
214: PLT15
215: PLT14
216: PLT13
217: PLT12
218: PLT11
219: PLT10
220: PLT09
221: PLT24

INFORME (s) CDEC Nº: **IF N° 00035/2016**	FECHA DE FALLA: **07 DE ENERO 2016**
INSTALACIÓN (ES) EDAC CONTINGENCIA EXTREMA SE SAN VICENTE DE TAGUA-TAGUA	

```
222: PLT23
223: PLT22
224: PLT21
225: PLT20
226: PLT19
227: PLT18
228: PLT17
229: PLT32
230: PLT31
231: PLT30
232: PLT29
233: PLT28
234: PLT27
235: PLT26
236: PLT25
237: PCT16Q
238: PCT15Q
239: PCT14Q
240: PCT13Q
241: PCT12Q
242: PCT11Q
243: PCT10Q
244: PCT09Q
245: PCT24Q
246: PCT23Q
247: PCT22Q
248: PCT21Q
249: PCT20Q
250: PCT19Q
251: PCT18Q
252: PCT17Q
253: PCT32Q
254: PCT31Q
255: PCT30Q
256: PCT29Q
257: PCT28Q
258: PCT27Q
259: PCT26Q
260: PCT25Q
261: IN202
262: IN201
263: SALARM
264: HALARM
265: BADPASS
266: HALARML
267: HALARMP
268: HALARMA
269: ACCESS
270: ACCESSP
271: SETCHG
272: GRPSW
273: PASSDIS
274: BRKENAB

=>

=>

=>SHO T
Alias
```

INFORME (s) CDEC Nº: **IF N° 00035/2016**	FECHA DE FALLA: **07 DE ENERO 2016**
INSTALACIÓN (ES) EDAC CONTINGENCIA EXTREMA SE SAN VICENTE DE TAGUA-TAGUA	

```
Relay Aliases
(RW Bit or Analog Qty. 7 Character Alias [0-9 A-Z _])

1: EN,"RLY_EN"
2: TLED_3,"COMM"
3: TLED_4,"SOTF"
4: TLED_5,"NEG_SEQ"
5: TLED_6,"79_RST"
6: TLED_7,"79_CYC"
7: TLED_8,"79_LO"
8: TLED_9,"A_FAULT"
9: TLED_10,"B_FAULT"
10: TLED_11,"C_FAULT"
11: TLED_12,"GND"
12: TLED_13,"LOPTN"
13: TLED_14,"VAY_ON"
14: TLED_15,"VBY_ON"
15: TLED_16,"VCY_ON"
16: TLED_17,"VAZ_ON"
17: TLED_18,"VBZ_ON"
18: TLED_19,"VCZ_ON"
19: TLED_20,"BK1FAIL"
20: TLED_21,"BK1WEAR"
21: TLED_22,"EXTTRIP"
22: TLED_23,"51PICUP"
23: TLED_24,"IRIGLCK"

=> SHO Z
Group 1

Line Configuration

Z1MAG   := 10.00    Z1ANG   := 90.00    Z0MAG   := 10.00    Z0ANG   := 90.00
EFLOC   := N

Relay Configuration

ESOTF   := N        ELOAD   := N        E50P    := N        E50G    := N
E50Q    := N        E51S    := N        E59     := N        E27     := N
E81     := 1        E32     := N        ECOMM   := N        EBFL1   := N
E25BK1  := N        E79     := N        EMANCL  := N        ELOP    := Y
EDEM    := THM      EXFMRHB := N        EADVS   := Y
VMEMC   := 0


81 Elements

81UVSP  := 50.00    81D1P   := 49.70    81D1D   := 0.20

Pole Open Detection

EPO     := 52       3POD    := 0.500

Demand Metering

DMTC    := 15       PDEMP   := OFF      GDEMP   := OFF      QDEMP   := OFF


Trip Logic

TR      := PLT32 AND PSV21
```

INFORME (s) CDEC Nº: **IF N° 00035/2016**	FECHA DE FALLA: **07 DE ENERO 2016**
INSTALACIÓN (ES) EDAC CONTINGENCIA EXTREMA SE SAN VICENTE DE TAGUA-TAGUA	

```
BK1MTR  := NA
ULTR    := IN202
ULMTR1  := NA
TULO    := 3        TDUR3D  := 20.000
ER      := PSV21 OR PSV22 OR PSV23 OR 81D1UDR

=>
```

INFORME (s) CDEC Nº: **IF N° 00035/2016**	FECHA DE FALLA: **07 DE ENERO 2016**
INSTALACIÓN (ES) EDAC CONTINGENCIA EXTREMA SE SAN VICENTE DE TAGUA-TAGUA	

ANEXO N°3

NOVEDADES RELEVANTES DEL CDEC-SIC 07-01-2015

INFORME (s) CDEC Nº: **IF N° 00035/2016**	FECHA DE FALLA: **07 DE ENERO 2016**
INSTALACIÓN (ES) EDAC CONTINGENCIA EXTREMA SE SAN VICENTE DE TAGUA-TAGUA	

CDEC SIC

Hora	Observación
00:00	Cs. Pehuenche, Colbún y Rapel ratifican condición de agotamiento.
00:06	C. Ralco U-2 toma la regulación de frecuencia.
00:07	C. San Isidro II TV disponible y sincronizada.
00:41	Línea de 66 kV Pan de Azúcar – Marquesa interrupción forzada por protecciones, se pierden 12 MW de consumos.
01:04	C. San Isidro TG se retira por control suministro de gas.
01:08	Línea de 154 kV Tinguiririca – Rancagua – Alto Jahuel 2 interrupción forzada por protecciones, se pierden 77 MW de consumos correspondientes a SS/EE Cachapoal, Machalí, Loreto, Lo Miranda, Tuniche, Quinta de Tilcoco, Las Cabras y El Manzano. Causa informada: Robo de conductor entre estructuras Nº 354 y 355.
01:08	S/E Tinguiririca línea de 154 kV Itahue – Tinguiririca 2 interrupción forzada por protecciones, en S/E Itahue se encontraba abierto por control de oscilaciones.
01:10	C. La Higuera U-1 F/S a solicitud del CDC para eliminar las oscilaciones en línea de 154 kV Tinguiririca – Rancagua – Alto Jahuel 1.
01:12	Cerrada línea de 66 kV Pan de Azúcar – Marquesa y normalizado los consumos.
01:12	S/E Punta de Cortés CC de Transelec abre interruptores de línea de 154 kV Tinguiririca – Rancagua – Alto Jahuel 1 y 2, no autorizado por el CDC. Centrales que inyectan en S/E Tinguiririca quedan generando en isla alimentando los consumos de SS/EE San Fernando y Teno. Por operación de EDAC se pierden 23 y 25 MW de consumos correspondientes a SS/EE San Fernando y Teno, se autoriza la reposición inmediata.
01:12	C. La Confluencia U-1 sale del servicio en forma intempestiva con 77 MW.
01:12	C. El Paso U-2 y U-3 salen del servicio en forma intempestiva con 40 MW.
01:12	S/E Teno Planta Papeles Arauco pierde 1,3 MW de consumos por operación de EDAC.
01:17	S/E Itahue sincronizada línea de 154 kV Itahue – Tinguiririca 1.
01:19	Recuperado los consumos de SS/EE Quinta de Tilcoco, Las Cabras y El Manzano.
01:19	Línea de 154 kV Punta de Cortés – Rancagua – Alto Jahuel 1 interrupción forzada por protecciones, se pierden 87 MW de consumos correspondientes a SS/EE Buin TR Nº 2, Fátima, Hospital, Isla de Maipo, Graneros, San Francisco de Mostazal y Papelera Talagante. Causa informada: Robo de conductor entre estructuras Nº 354 y 355.
01:19	S/E Rancagua alimentado en isla desde S/E Sauzal.
01:21	S/E Teno Planta Papeles Arauco normalizado consumos.
01:21	Recuperado los consumos del TR Nº 2 de S/E Buin.
01:27	S/E Alto Jahuel cierre manual sin éxito de línea de 154 kV Punta de Cortés – Rancagua – Alto Jahuel 1.
01:28	S/E Alto Jahuel cierre manual sin éxito de línea de 154 kV Punta de Cortés – Rancagua – Alto Jahuel 2.
01:32	Cerrada línea de 154 kV Itahue – Tinguiririca 2.
01:36	C. Coya U-5 F/S a solicitud del CDC para transferir su inyección hacia S/E Rancagua para mejorar condiciones de tensión y frecuencia en la zona.
01:43	Línea de 66 kV Rancagua – Rosario se realiza microcorte para transferir consumos desde S/E Rancagua hacia S/E Malloa, para mejorar regulación de frecuencia y voltaje en área de Rancagua alimentada en isla desde C. Sauzal.
01:43	C. Chacayes U-1 sale del servicio en forma intempestiva con 60 MW.
01:50	C. Sauzalito sale del servicio en forma intempestiva con 11.5 MW.
01:51	C. Coya U-5 sincronizada hacia Rancagua.
01:53	C. Coya U-5 F/S a solicitud del CDC para transferir su inyección hacia S/E Alto Jahuel.
01:57	S/E Rancagua F/S a solicitud del CDC para transferir consumos hacia S/E Alto Jahuel, debido a mala regulación de frecuencia, tensión y recuperar la mayor cantidad de consumos pérdidos en la zona.
02:00	C. La Higuera empieza a verter.
02:10	C. Coya U-5 sincronizada hacia S/E Alto Jahuel.
02:12	C. Sauzal U-2 F/S a solicitud del CDC para transferir su inyección hacia S/E Alto Jahuel.
02:40	S/E Rancagua E/S desde S/E Alto Jahuel.
02:41	Recuperados los consumos de SS/EE Hospital y Fátima parcialmente.
02:51	Recuperados los consumos del TR 1 de S/E Isla de Maipo.
03:00	C. Sauzal U-2 sincronizada hacia S/E Alto Jahuel.
03:09	Recuperados el 100% de los consumos de S/E Isla de Maipo.
03:15	Recuperados los consumos de SS/EE Cachapoal y Machalí.
03:37	C. Esperanza unidades con informe de limitación, no obedecen orden de partida remota.
03:42	Recuperado 2 MW de consumos de S/E Papelera Talagante.
03:47	C. Chacayes U-1 sincronizada hacia S/E Alto Jahuel.

INFORME (s) CDEC Nº: **IF N° 00035/2016**	FECHA DE FALLA: **07 DE ENERO 2016**
INSTALACIÓN (ES) EDAC CONTINGENCIA EXTREMA SE SAN VICENTE DE TAGUA-TAGUA	

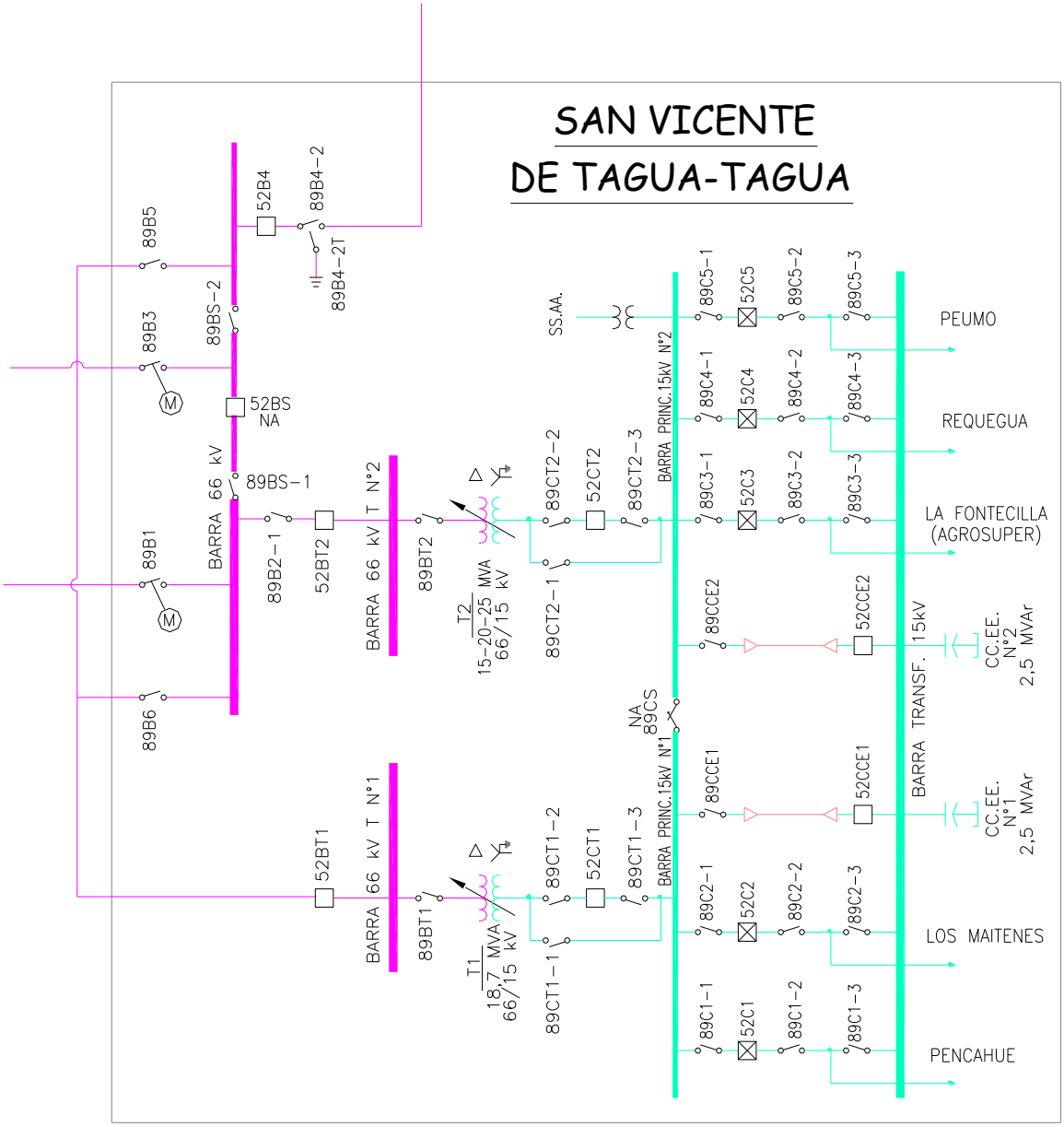
Hora	Observación
04:01	Recuperado los consumos de S/E Tuniche.
04:19	S/E Punta de Cortés con solicitud de intervención de curso forzoso. Causa informada: A solicitud de Transelec para iniciar reparación de línea de 154 kV Tinguiririca – Rancagua – Alto Jahuel 1 y 2.
04:19	S/E Malloa con solicitud de intervención de curso forzoso. Causa informada: A solicitud de Transelec para iniciar reparación de línea de 154 kV Tinguiririca – Rancagua – Alto Jahuel 1 y 2
04:23	C. Esperanza unidades DS-1 y DS-2 sincronizadas, TG-1 indisponible. Causa informada: Falla en la partida por problemas en el calefactor del aceite.
05:07	C. M. Valle Central CDC solicita reducir sus consumos desde 28 a 5 MW (consumos esenciales), para controlar la transferencia en transformadores de 110/154 kV de S/E Sauzal.
05:18	C. Sauzalito sincronizada.
05:54	Se recuperan 3.5 MW de S/E Lo Miranda.
06:13	Se recuperan los consumos de S/E Loreto.
06:13	Se recuperan 1,8 MW de S/E Lo Miranda.
07:06	C. Guacolda U-5 baja al mínimo técnico con solicitud de intervención de curso forzoso. Causa informada: Realizar revisión al motor del calentador de aire de la caldera por ruido anormal, este equipo es crítico para la unidad.
07:28	Chilectra SDAC habilitado.
08:11	S/E Rancagua se reduce 1 MW de consumos a solicitud del CDC por control de transferencia del TR4 de 110/154 kV.
08:16	S/E Rancagua alimentador Berrios reduce 3 MW de consumos a solicitud del CDC por control de transferencia de TR4 de 110/154 kV.
08:23	Compañía Papelera Talagante reduce 1 MW de consumos por control de transferencia de línea de 66 kV Paine – Bajo Melipilla.
08:26	S/E Rancagua alimentador Río Peuco reduce 3 MW de consumos a solicitud del CDC por control de transferencia de TR4 de 110/154 kV.
08:41	S/E Rancagua se reduce 4,3 MW de consumos a solicitud del CDC por control de transferencia de TR4 de 110/154 kV.
08:42	Línea de 44 kV Carena - Puente Alto interrupción forzada por protecciones.
08:42	C. Carena sale del servicio en forma intempestiva con 9 MW.
08:47	Cerrada línea de 154 kV Rancagua – A. Jahuel 1 queda abierto puentes en estructura 359, CDC solicita normalizar el 100 % de los consumos de SS/EE Rancagua y Paine.
09:03	C. Guacolda U-5 cancelada solicitud de intervención de curso forzoso y queda con solicitud de desconexión de curso forzoso. Causa informada: Falla en motor de calentador de aire de la caldera.
09:06	C. Guacolda U-3 sincronizada.
09:17	Compañía Papelera Talagante normaliza el 100 % de los consumos.
09:37	S/E Cerro Navia habilitado trip por contingencia específica del ATR Nº 2 ó 5 de 220/110 kV, 400 MVA sobre la línea de 110 kV Cerro Navia – El Salto 2.
09:39	CDC solicita a C. Minera Valle Central reducir sus consumos a 0 MW para realizar cambio de barra de 110 kV en S/E Sauzal.
09:40	CDC solicita a C. Minera Valle Central normalizar el 100 % de sus consumos, queda alimentado desde S/E Rancagua.
10:13	C. Sauzal U-2 cambia su inyección hacia S/E Rancagua.
10:20	S/E Lo Miranda reduce 2,5 MW de consumos por control de transferencia de línea de 66 kV Rancagua – Punta de Cortés.
10:15	S/E Nahuelbuta interruptor 52CT1 general de barra de 13,2 kV interrupción forzada por protecciones, se pierden 2.9 MW de consumos correspondientes a los alimentadores Roblería y Parronal.
10:37	S/E Nahuelbuta cerrado interruptor 52CT1 general de barra de 13,2 kV y normalizados consumos.
10:39	S/E Punta de Cortés cerrado interruptor 52A2 de línea 1 de 154 kV Tinguiririca – T 342.
10:39	Línea de 154 kV Tinguiririca – Rancagua – A. Jahuel 1 con solicitud de intervención de curso forzoso. Causa informada: Trabajos en circuito adyacente.
10:41	C. Quintero TG-1B sincronizada por disponibilidad de GNL.
10:56	S/E Rancagua abierto interruptor 52B5 de línea de 66 kV Rancagua – Punta de Cortés para realizar microcorte afectando los consumos de S/E Punta de Cortés con 54 MW. Causa informada: Normalización de topología por 154 kV.
10:56	S/E Punta de Cortés cerrado 52AT quedando normalizada topología por 154 kV y normalizado el 100 % de los consumos.

INFORME (s) CDEC Nº: **IF N° 00035/2016**	FECHA DE FALLA: **07 DE ENERO 2016**
INSTALACIÓN (ES) EDAC CONTINGENCIA EXTREMA SE SAN VICENTE DE TAGUA-TAGUA	

ANEXO N°4

UNILINEAL SE SAN VICENTE DE TAGUA-TAGUA

INFORME (s) CDEC Nº: **IF N° 00035/2016**	FECHA DE FALLA: **07 DE ENERO 2016**
INSTALACIÓN (ES) EDAC CONTINGENCIA EXTREMA SE SAN VICENTE DE TAGUA-TAGUA	



INFORME (s) CDEC Nº: **IF N° 00035/2016**	FECHA DE FALLA: **07 DE ENERO 2016**
INSTALACIÓN (ES) EDAC CONTINGENCIA EXTREMA SE SAN VICENTE DE TAGUA-TAGUA	

ANEXO N°5

CARTA UNIDAD DE EXPLOTACIÓN DE LA RED UER N°754-2015 QUE COMPLEMENTA CARTA GIO N°383/2015 EN RPTA a DO 819-2015_ VERIFICACIÓN RELÉ EDAC SAN VICENTE TT

INFORME (s) CDEC Nº: **IF N° 00035/2016**	FECHA DE FALLA: **07 DE ENERO 2016**
INSTALACIÓN (ES) EDAC CONTINGENCIA EXTREMA SE SAN VICENTE DE TAGUA-TAGUA	

CONAFE emelat GRUPO CGE elecda GRUPO CGE CGE DISTRIBUCION TRANSNET GRUPO CGE

Santiago, 30 de Diciembre de 2015
Unidad de Explotación de la Red Nº754

Señor
Ernesto Huber J.
Subdirector de Operación
CDEC-SIC
Teatinos 280, piso 11
Santiago

Ref.: Complementa carta GIO 383/2015 en Respuesta a carta DO N°819-2015. Apertura Intempestiva 52BT2 San Vicente TT ocurrida el 27 de Mayo 2015

Estimado Señor:

En relación a nuestra Carta GIO N°383/2015 que da respuesta a carta DO N°819-2015, en relación al evento de la referencia, con el objeto de hacer seguimiento a la actividad siguiente:

-Verificación y resultados de una revisión del sistema de medición de la frecuencia y su gradiente en el relé asociado al escalón 1 del EDACxCEx en San Vicente de Tagua Tagua. Lo anterior, debido a que los registros informados por su representada no se condicen con el comportamiento observado de la frecuencia y su gradiente en el sistema en el día y horario de este evento, provocando de este modo la operación incorrecta de este escalón.

Al respecto, indicamos a usted que en Anexo a la presente se encuentra respuesta a lo solicitado.

Quedamos a su disposición para atender consultas sobre el particular.

Atentamente,

CGE DISTRIBUCION S.A.
COMPAÑÍA NACIONAL DE FUERZA ELÉCTRICA S.A.
EMPRESA ELÉCTRICA DE ANTOFAGASTA S.A.
EMPRESA ELÉCTRICA ATACAMA S.A.
TRANSNET S.A.

Roberto Espinoza Rodriguez

Encargado D.O. Empresas grupo CGE

MQS

c.c.: Unidad de Gestor de Red de Electricidad
Unidad de Explotacion de la Red

Inc: Anexo

Av. Presidente Riesco 5561, Piso 15
Las Condes, Santiago, Chile
Teléfono: (56) 2 2280 70 00
Fax: (56) 2 2280 73 76

INFORME (s) CDEC Nº: **IF N° 00035/2016**	FECHA DE FALLA: **07 DE ENERO 2016**
INSTALACIÓN (ES) EDAC CONTINGENCIA EXTREMA SE SAN VICENTE DE TAGUA-TAGUA	

Anexo Carta UER N°754/2015 Complementa carta GIO 383/2015 en Respuesta a carta DO N°819-2015

Verificación y resultados de una revisión del sistema de medición de la frecuencia y su gradiente en el relé asociado al escalón 1 del EDACxCEx en San Vicente de Tagua Tagua. Lo anterior, debido a que los registros informados por su representada no se condicen con el comportamiento observado de la frecuencia y su gradiente en el sistema en el día y horario de este evento, provocando de este modo la operación incorrecta de este escalón.

A la fecha de hoy, hemos recibido una propuesta de mejoras al software del relé por parte de la empresa TECMA, la cual considera la incorporación de ecuaciones que generan mayor seguridad ante la detección de componentes de secuencia negativa y directa, así como también la utilización del ángulo del fasor de secuencia positiva para el cálculo del ángulo y umbrales de tensión de bloqueo requeridos por norma.

Dentro de las actividades pendientes de desarrollo se encuentra el análisis del ajuste por parte de Transnet, pruebas de la mejoras en Reles en laboratorios del proveedor, para luego implementar esta Lógica de Operación en los relé EDACxCE de Transnet.

La actividad de pruebas en laboratorio de relés EDAC con las modificaciones propuestas, fue coordinada para realizarse la segunda semana de Febrero 2016 e incluye la participación de especialistas de Transnet, de esa manera se puede emitir la versión final del ajuste. Una vez finalizada esta etapa se procederá a la implementación la cual se espera realizar en el primer semestre del 2016 .

En el archivo anexo "Protocolo de pruebas EDACxCE_SVTT_V3.pdf" enviamos el informe de protocolo de pruebas del reles realizado durante le mes de Agosto 2015 , y en esa oportunidad se quedó a la espera de la proposición de la lógica por parte del fabircante. Según los resultados obtenidos en ese protocolo, se concluye que el relé de protección opera correctamente según sus ajustes y se encuentra apto para seguir en servicio.

Enviamos los respaldos de la propuesta de mejora con el setting propuesto en archivo Word "adjunto Setting_451-5_Propuesto_V0.doc" y la nueva lógica del rele en el el archivo "SEL-451-5_EDACxCE_SE-SVTT_Enacsel_V0.rbd"

Av. Presidente Riesco 5561, Piso 15
Las Condes, Santiago, Chile
Teléfono: (56) 2 2280 70 00
Fax: (56) 2 2280 73 76

TRANSNET
GRUPO CGE

INFORME DE FALLA

REQUERIMIENTO NORMA TÉCNICA DE SyCS

INFORME (s) CDEC Nº: **IF 00038/2016**	FECHA DE FALLA: **07 de enero 2016**
INSTALACIÓN (ES): SSEE Rauquen y Curicó	

OPERACIÓN DE EDAC ZONA MAULE.

1. CAUSA U ORIGEN DE LA FALLA:

1.1. Fecha y hora de la Falla:

Fecha	**07 de enero de 2016**
Hora	01:13

1.2. Localización de la falla:

Externa al sistema de TRANSNET S.A., que de acuerdo a lo informado por medios oficiales del CDEC-SIC se debió a falla en instalaciones de propiedad de Transelec.

1.3. Causa de la Falla:

Falla externa a instalaciones de Transnet, que de acuerdo a lo informado por medios oficiales del CDEC-SIC, fue a causa de perturbación en instalaciones de Transelec lo cual origino la operación de los esquemas de desconexión automática de carga EDAC en distintos puntos del sistema.

1.4. Código falla:

Causas de Falla	**Código**	**Descripción**
Fenómeno Físico	(*)	
Elemento del Sistema Eléctrico	(*)	
Fenómeno Eléctrico	FR81	Frecuencia
Modo	13	Opera según lo esperado

(*) Falla en instalación de terceros, no corresponde a Transnet indicar código.

1.5. Comuna donde se originó la operación:

Comuna_ID	**Nombre Comuna**	**Provincia**	**Región**
7301	Curicó	Curicó	Maule

1.6. Reiteración:

IF N°	**Fecha falla**	**Hora falla**
IF00602/2015	10/03/2015	16:36

INFORME (s) CDEC Nº: **IF 00038/2016**	FECHA DE FALLA: **07 de enero 2016**
INSTALACIÓN (ES): SSEE Rauquen y Curicó	

2. Resumen por subestaciones:

CONSUMO TOTAL ZONA MAULE PREVIO A LA OPER. EDAC (MW)	**454,87 MW**
DESPRENDIMIENTO TOTAL POR EDAC ZONA MAULE (MW)	**13,16 MW**
DESPRENDIMIENTO ZONA MAULE (%)	**2,89 %**

2.1 Operación EDAC subestación RAUQUÉN:

CONSUMO TOTAL ZONA MAULE PREVIO A LA OPER. EDAC (MW)	**454,87 MW**
DESPRENDIMIENTO TOTAL POR EDAC ZONA MAULE (MW)	**9,03 MW**
DESPRENDIMIENTO ZONA MAULE (%)	**1,99 %**

INFORME DE FALLA

REQUERIMIENTO NORMA TÉCNICA DE SyCS

INFORME (s) CDEC Nº: **IF 00038/2016**	FECHA DE FALLA: **07 de enero 2016**
INSTALACIÓN (ES): SSEE Rauquen y Curicó	

Reporte del evento

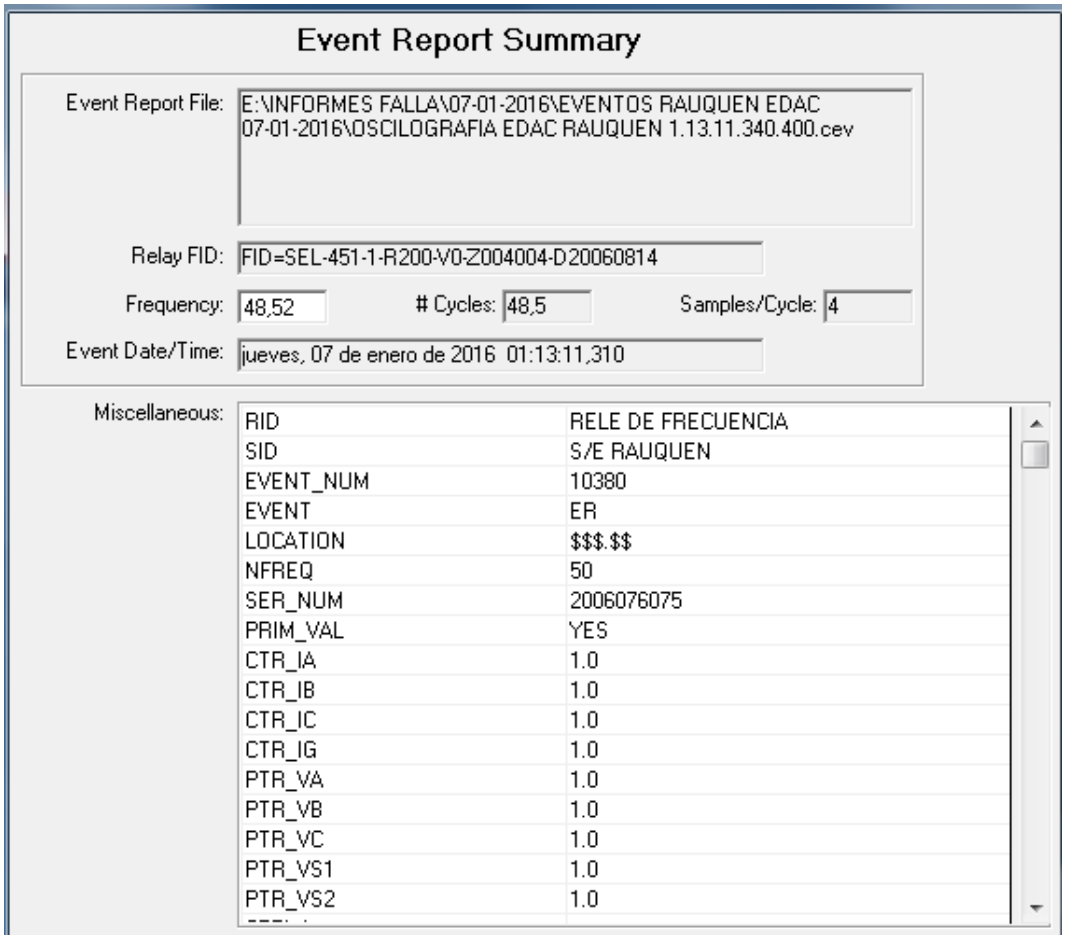


Figura 1. Resumen del evento. Se muestra la fecha y hora de la falla y otros datos.

INFORME DE FALLA

REQUERIMIENTO NORMA TÉCNICA DE SyCS

INFORME (s) CDEC Nº: **IF 00038/2016**	FECHA DE FALLA: **07 de enero 2016**
INSTALACIÓN (ES): SSEE Rauquen y Curicó	

Oscilografías .

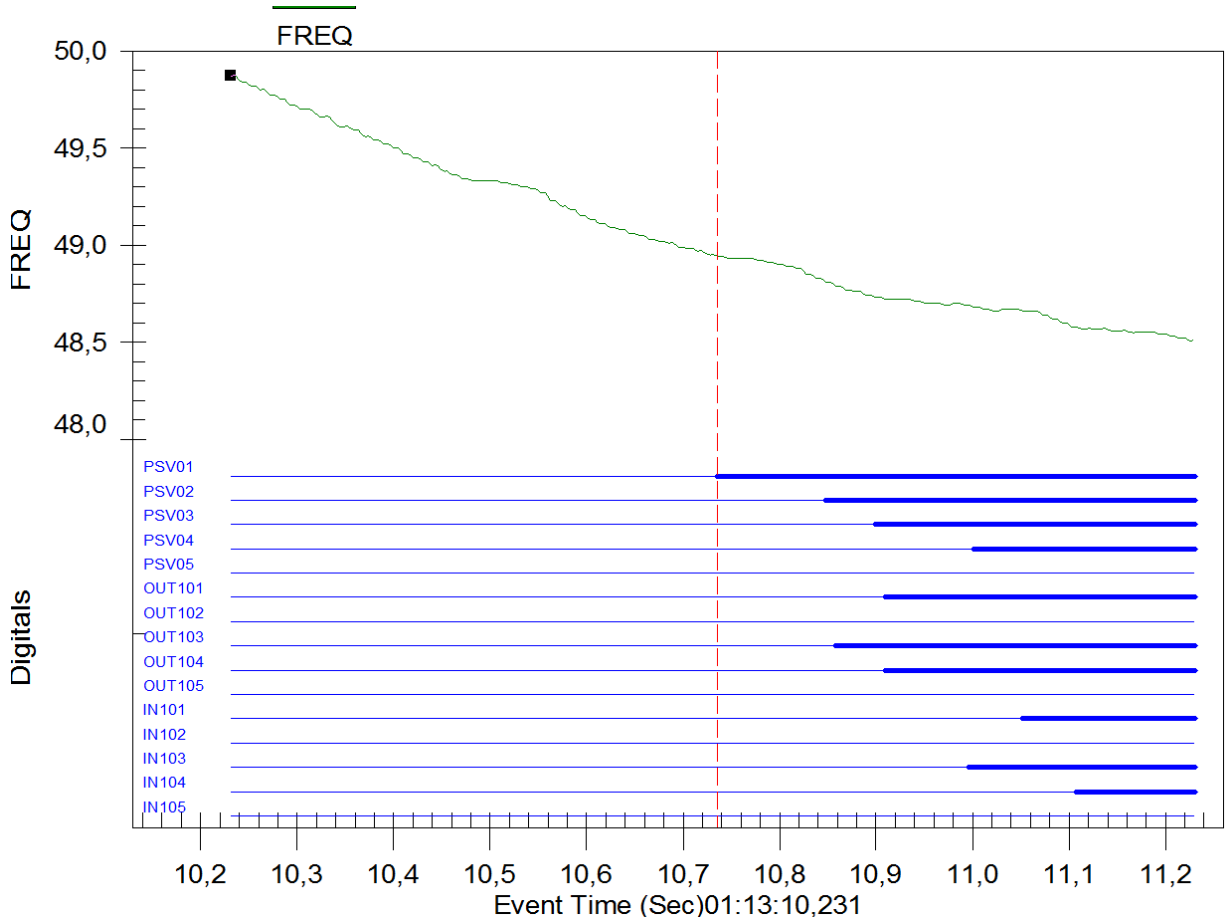


Figura 2. Oscilografía y variables digitales de salida activadas del relé.

La oscilografía muestra las variables de interés para analizar el evento en cuestión. La descripción de cada una de ellas es la siguiente:

- OUT101: Escalón EDAC 3, apertura circuito Los Vidales 52C2.
- OUT103: Escalón EDAC 2, apertura circuito Quilvo 52C4.
- OUT104: Escalón EDAC 3, apertura circuito Sarmiento 52C5.
- OUT106: Alarma EDAC operado.

INFORME (s) CDEC Nº: **IF 00038/2016**	FECHA DE FALLA: **07 de enero 2016**
INSTALACIÓN (ES): SSEE Rauquen y Curicó	

La variable PSV02 corresponde a la activación de EDAC2 (48.9 Hz).
La variable PSV03 corresponde a la activación de EDAC3 (48.8 Hz y -0,6 Hz/seg).

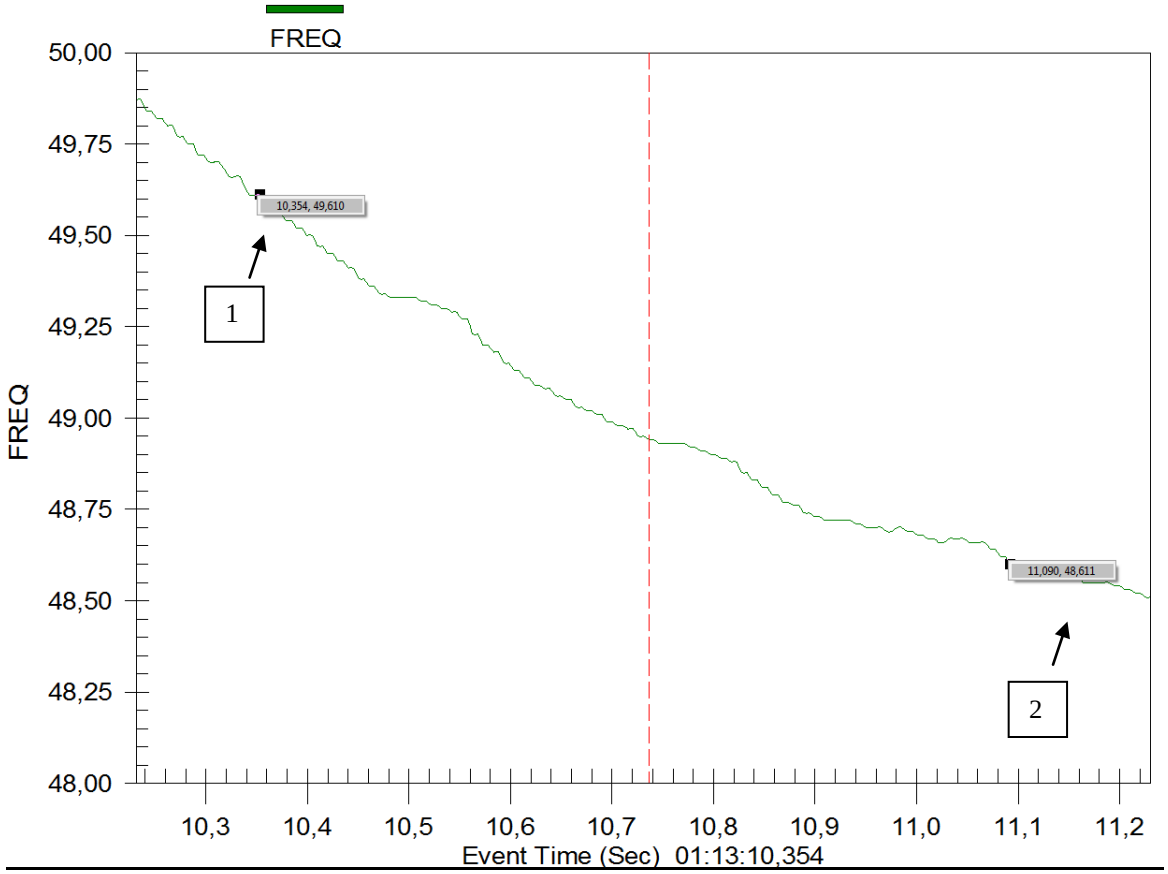


Figura 3. Zoom realizado a la oscilografía para cálculo de df/dt.

Escalón EDAC 3

1 = 49.610 Hz, 10.354 seg.
2 = 48.611 Hz, 11.090 seg.

El cálculo gráfico de la velocidad de caída de la frecuencia es:
df/dt = (49.610 – 48.611) / (10.354-11.090) = -1.357 Hz/seg, es menor a -0.6 Hz/seg, por lo que se confirma la correcta operación del escalón EDAC 3.

TRANSNET
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INFORME DE FALLA

REQUERIMIENTO NORMA TÉCNICA DE SyCS

INFORME (s) CDEC Nº: **IF 00038/2016**	FECHA DE FALLA: **07 de enero 2016**
INSTALACIÓN (ES): SSEE Rauquen y Curicó	

REGISTROS SER

RELE DE FRECUENCIA Date: 11/01/2016 Time: 12:06:25.691

S/E RAUQUEN Serial Number: 2006076075

FID=SEL-451-1-R200-V0-Z004004-D20060814

#	DATE	TIME	ELEMENT	STATE
34	21/12/2015	13:31:13.375	Los Vidales ex Rauqu 52C2	cerrado
33	07/01/2016	01:13:10.733	EDAC1	Asserted
32	07/01/2016	01:13:10.845	EDAC2	Asserted
31	07/01/2016	01:13:10.858	QUILVO	Asserted
30	07/01/2016	01:13:10.858	Quilvo	Trip EDAC 2
29	07/01/2016	01:13:10.896	EDAC3	Asserted
28	07/01/2016	01:13:10.909	CTO_RAUQUEN	Asserted
27	07/01/2016	01:13:10.909	SARMIENTO	Asserted
26	07/01/2016	01:13:10.909	Los Vidales ex Rauq	Trip EDAC 3
25	07/01/2016	01:13:10.909	Sarmiento	Trip EDAC 3
24	07/01/2016	01:13:10.996	Cto Quilvo	52C4 abierto
23	07/01/2016	01:13:10.999	EDAC4	Asserted
22	07/01/2016	01:13:11.050	Los Vidales ex Rauqu 52C2	abierto
21	07/01/2016	01:13:11.109	Cto Sarmiento	52C5 abierto
20	07/01/2016	01:13:11.307	EDAC5	Asserted
19	07/01/2016	01:13:11.917	EDAC6	Asserted
18	07/01/2016	01:13:12.321	EDAC1	Deasserted
17	07/01/2016	01:13:12.321	EDAC3	Deasserted
16	07/01/2016	01:13:12.333	Los Vidales ex Rauq	Reset Trip EDAC 3
15	07/01/2016	01:13:12.333	Sarmiento	Reset Trip EDAC 3
14	07/01/2016	01:13:13.227	EDAC6	Deasserted
13	07/01/2016	01:13:13.636	EDAC5	Deasserted
12	07/01/2016	01:13:13.932	EDAC4	Deasserted
11	07/01/2016	01:13:14.433	EDAC2	Deasserted
10	07/01/2016	01:13:14.446	Quilvo	Reset Trip EDAC 2
9	07/01/2016	01:13:14.525	EDAC2	Asserted

INFORME DE FALLA

REQUERIMIENTO NORMA TÉCNICA DE SyCS

INFORME (s) CDEC Nº: **IF 00038/2016**	FECHA DE FALLA: **07 de enero 2016**
INSTALACIÓN (ES): SSEE Rauquen y Curicó	

8	07/01/2016	01:13:14.540	Quilvo	Trip EDAC 2
7	07/01/2016	01:13:17.440	EDAC2	Deasserted
6	07/01/2016	01:13:17.456	Quilvo	Reset Trip EDAC 2
5	07/01/2016	01:23:51.000	Los Vidales ex Rauqu	52C2 cerrado
4	07/01/2016	01:30:11.811	Cto Quilvo	52C4 Cerrado
3	07/01/2016	01:59:46.651	Cto Sarmiento	52C5 Cerrado
2	08/01/2016	08:53:44.114	Los Vidales ex Rauqu	52C2 abierto
1	08/01/2016	08:53:44.149	Los Vidales ex Rauqu	52C2 cerrado

De acuerdo a estos registros, se tiene la correcta operación de la protección:

EDAC 2 Alimentador Quilvo
EDAC 3 Alimentadores Sarmiento y Los Vidales

INFORME DE FALLA

REQUERIMIENTO NORMA TÉCNICA DE SyCS

INFORME (s) CDEC Nº: **IF 00038/2016**	FECHA DE FALLA: **07 de enero 2016**
INSTALACIÓN (ES): SSEE Rauquen y Curicó	

Resumen operación EDAC

De acuerdo a los registros SER, puede establecerse la siguiente secuencia de operación.

Escalón EDAC	Ajuste Frecuencia	Alimentador	Hora Activación Escalón	Hora Desconexión Escalón (alimentador)	Tiempo de operación Escalón (ms)	Monto de carga disponible MW	Monto de carga desconectada MW	Hora de recuperación de consumos
EDAC1	49 Hz & -0,6 Hz/s	Sin aplicación	------	------	------	No corresponde	No corresponde	------
EDAC2	48,9 Hz	52C4 Cto. Quilvo	01:13:10.845	01:13:10.858	13	3,81	3,81	07/01/2016 01:30
EDAC3	48,8 Hz & -0,6 Hz/s	52C2 Los Vidales	01:13:10.896	01:13:10.909	13	2,39	2,39	07/01/2016 01:24
EDAC3	48,8 Hz & -0,6 Hz/s	52C5 Sarmiento	01:13:10.896	01:13:10.909	13	2,83	2,83	07/01/2016 02:00
EDAC4	48,7 Hz	Sin aplicación	------	------	------	No corresponde	No corresponde	------
EDAC5	48,5 Hz	Sin aplicación	------	------	------	No corresponde	No corresponde	------
EDAC6	48,3 Hz	Sin aplicación	------	------	------	No corresponde	No corresponde	------
						Total	**9,03**	ENS=3,73 MWH

Tabla 1. La tabla resumen indica el tiempo de activación de los escalones de frecuencia EDAC 2 y EDAC 3, provocando la apertura de los alimentadores 52C2, 52C4 y 52C5. Además se señalan los ajustes de frecuencias para los distintos escalones y los montos de carga disponible y desconectada en MW.

En base a los registros SER y de Scada aportados en los puntos anteriores, se puede concluir que la protección SEL 451, en S.E Rauquen, operó en forma correcta, despejando la falla a traves de la activación de los escalones EDAC 2 y EDAC 3 provocando la operación de los alimentadores asociados a cada uno.

INFORME (s) CDEC Nº: **IF 00038/2016**	FECHA DE FALLA: **07 de enero 2016**
INSTALACIÓN (ES): SSEE Rauquen y Curicó	

2.2. Operación EDAC subestación CURICÓ

CONSUMO TOTAL ZONA MAULE PREVIO A LA OPER. EDAC (MW)	**454,87 MW**
DESPRENDIMIENTO TOTAL ZONA SE CURICO (MW)	**4,13 MW**
PORCENTAJE DEL DESPRENDIMIENTO ZONA SE CURICO (%)	**0,9 %**

INFORME DE FALLA

REQUERIMIENTO NORMA TÉCNICA DE SyCS

INFORME (s) CDEC Nº: **IF 00038/2016**	FECHA DE FALLA: **07 de enero 2016**
INSTALACIÓN (ES): SSEE Rauquen y Curicó	

Reporte

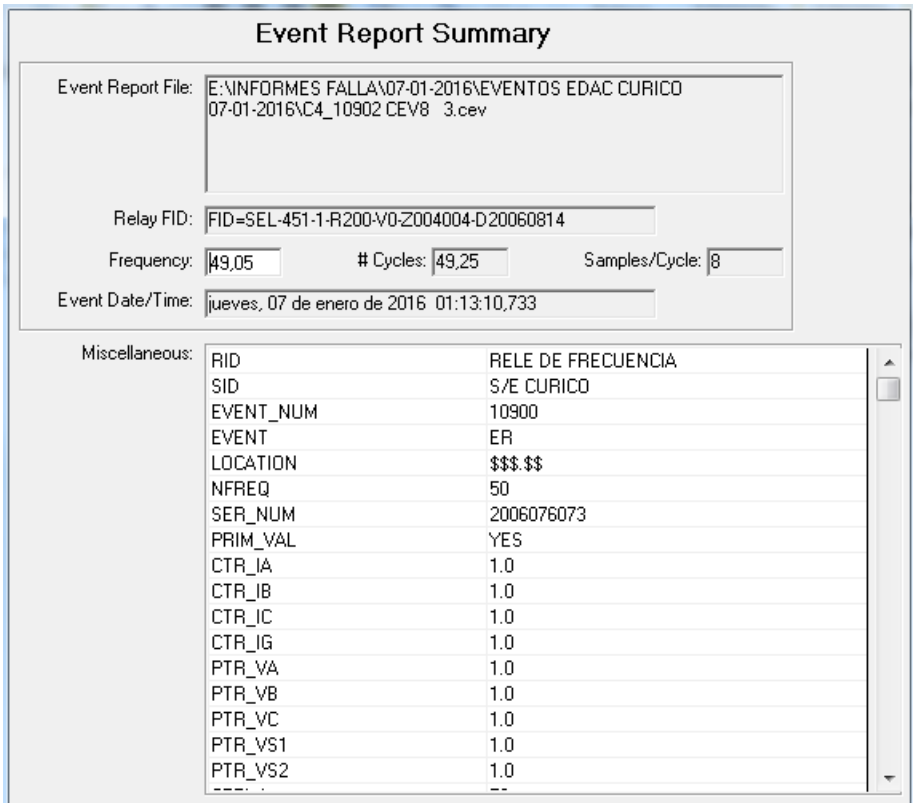

Figura 4. Resumen del evento. Se muestra la fecha y hora de la falla y otros datos.

INFORME (s) CDEC Nº: **IF 00038/2016**	FECHA DE FALLA: **07 de enero 2016**
INSTALACIÓN (ES): SSEE Rauquen y Curicó	

Oscilografía

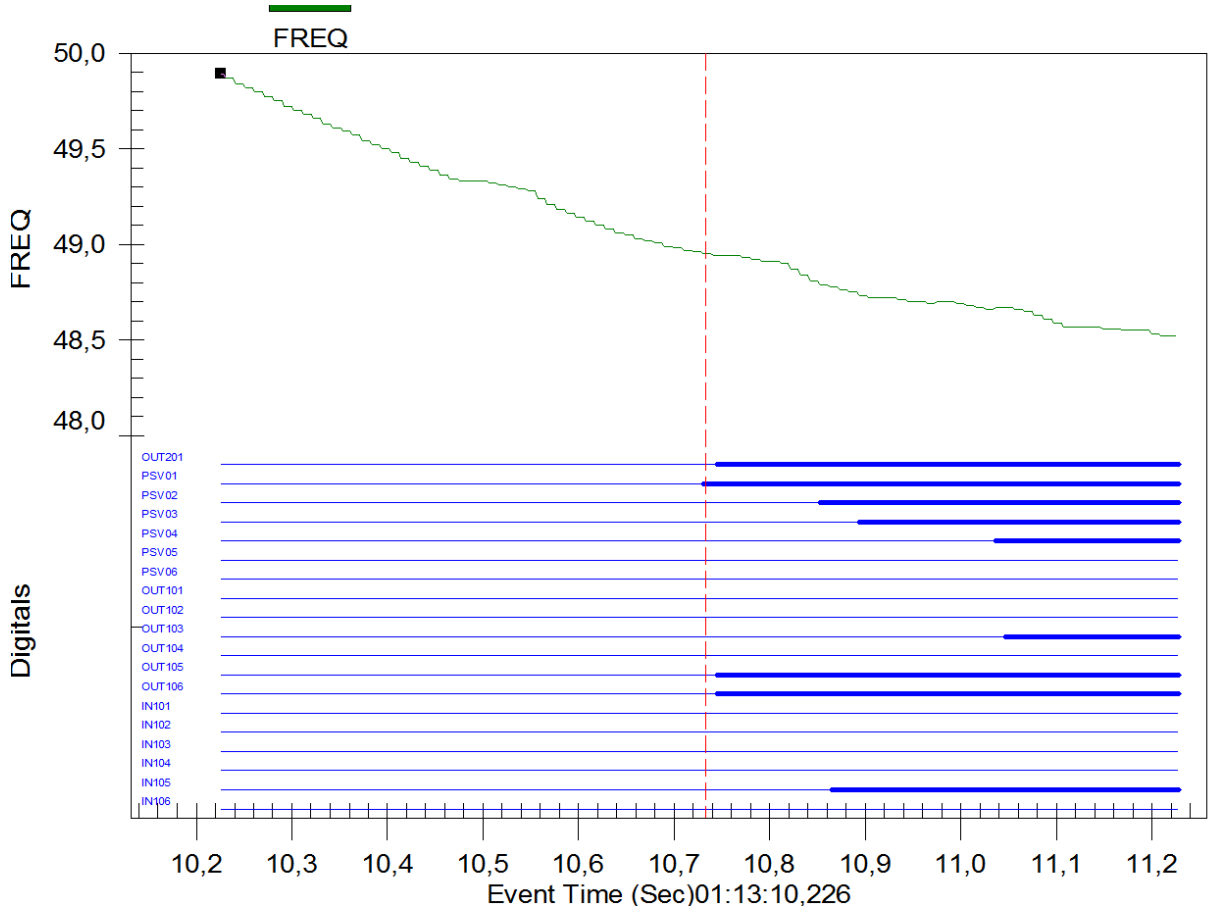

Figura 5. Oscilografía y variables digitales de salida activadas del relé.

La oscilografía muestra las variables de interés para analizar el evento en cuestión. La descripción de cada una de ellas es la siguiente:

- OUT105: Escalón EDAC 1, apertura circuito Aguas Negras 52C5.
- OUT201: Escalón EDAC 1, apertura circuito Zapallar 52C0.
- OUT103: Escalón EDAC 4, apertura circuito Rucatremo 52C3.
- OUT106: Alarma EDAC operado.

INFORME (s) CDEC Nº: **IF 00038/2016**	FECHA DE FALLA: **07 de enero 2016**
INSTALACIÓN (ES): SSEE Rauquen y Curicó	

Las variables PSV01, PSV02,PSV03, PSV04, PSV05 y PSV06 corresponden a la activación de EDAC1 (49 Hz & -0,6 Hz/s), EDAC2 (48.9 Hz), EDAC3 (48,8 Hz & -0,6 Hz/s), EDAC4 (48,7 Hz), EDAC5 y EDAC6 respectivamente.

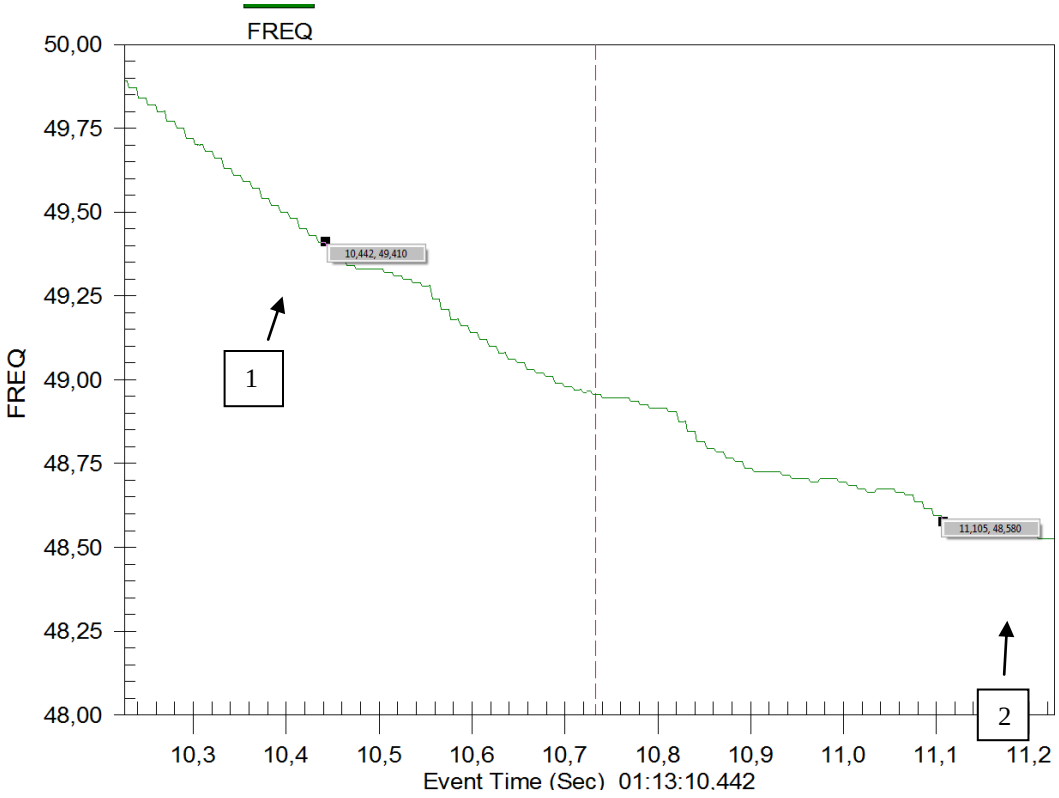

Figura 6. Zoom realizado a la oscilografía para cálculo de df/dt.

Escalón EDAC 1

1 = 49.410 Hz, 10.442 s.
2 = 48.580 Hz, 11.105 s.

El cálculo gráfico de la velocidad de caída de la frecuencia es:

df/dt = (49,410 – 48.580) / (10.442-11.105) = -1.25 Hz/seg, es menor a -0.6 Hz/seg, por lo que se confirma la correcta operación del escalón EDAC 1-

INFORME DE FALLA

REQUERIMIENTO NORMA TÉCNICA DE SyCS

INFORME (s) CDEC Nº: **IF 00038/2016**	FECHA DE FALLA: **07 de enero 2016**
INSTALACIÓN (ES): SSEE Rauquen y Curicó	

REGISTROS SER

RELE DE FRECUENCIA Date: 11/01/2016 Time: 12:42:44.996
S/E CURICO Serial Number: 2006076073

FID=SEL-451-1-R200-V0-Z004004-D20060814

#	DATE	TIME	ELEMENT	STATE
28	16/12/2015	13:13:35.995	BOMBERO GARRIDO	52C4 CERRADO
27	07/01/2016	01:13:10.731	EDAC1	Asserted
26	07/01/2016	01:13:10.746	C5_AGUAS_NEGRAS	Asserted
25	07/01/2016	01:13:10.746	C0_ZAPALLAR	Asserted
24	07/01/2016	01:13:10.746	AGUAS NEGRAS C5	Trip EDAC 1
23	07/01/2016	01:13:10.746	ZAPALLAR C0	TRip EDAC 1
22	07/01/2016	01:13:10.853	EDAC2	Asserted
21	07/01/2016	01:13:10.866	AGUAS NEGRAS	52C5 ABIERTO
20	07/01/2016	01:13:10.894	EDAC3	Asserted
19	07/01/2016	01:13:11.038	EDAC4	Asserted
18	07/01/2016	01:13:11.048	C3_RUCATREMO	Asserted
17	07/01/2016	01:13:11.048	RUCATREMO C3	TRIP EDAC4
16	07/01/2016	01:13:11.295	RUCATREMO	52C3 ABIERTO
15	07/01/2016	01:13:11.315	EDAC5	Asserted
14	07/01/2016	01:13:11.914	EDAC6	Asserted
13	07/01/2016	01:13:12.401	EDAC1	Deasserted
12	07/01/2016	01:13:12.401	EDAC3	Deasserted
11	07/01/2016	01:13:12.414	AGUAS NEGRAS C5	Reset Trip EDAC 1
10	07/01/2016	01:13:12.414	ZAPALLAR C0	Reset Trip EDAC 1
9	07/01/2016	01:13:13.224	EDAC6	Deasserted
8	07/01/2016	01:13:13.633	EDAC5	Deasserted
7	07/01/2016	01:13:13.930	EDAC4	Deasserted
6	07/01/2016	01:13:13.942	RUCATREMO C3	REset Trip EDAC 4
5	07/01/2016	01:13:14.430	EDAC2	Deasserted
4	07/01/2016	01:13:14.512	EDAC2	Asserted
3	07/01/2016	01:13:17.438	EDAC2	Deasserted
2	07/01/2016	01:25:29.763	RUCATREMO	52C3 CERRADO
1	07/01/2016	01:27:13.571	AGUAS NEGRAS	52C5 CERRADO

De acuerdo a estos registros, se demuestra la correcta operación de la protección del alimentador aguas negras 52C5, pero de los registros se observa la correcta orden de TRIP a la protección del alimentador 52C0 Zapallar, de lo cual no se produce la apertura.

EDAC 1 Alimentador Aguas Negras (52C5)
Alimentador Zapallar (52C0)
EDAC 4 Alimentador Rucatremo (52C3)

INFORME DE FALLA

REQUERIMIENTO NORMA TÉCNICA DE SyCS

INFORME (s) CDEC Nº: **IF 00038/2016**	FECHA DE FALLA: **07 de enero 2016**
INSTALACIÓN (ES): SSEE Rauquen y Curicó	

Resumen operación EDAC

De acuerdo a los registros SER, puede establecerse la siguiente secuencia de operación.

Escalón EDAC	Ajuste Frecuencia	Alimentador	Hora Activación Escalón	Hora Desconexión Escalón (alimentador)	Tiempo de operación Escalón (ms)	Monto de carga disponible MW	Monto de carga desconectada MW	Hora de recuperación de consumos
EDAC1	49 Hz & -0,6 Hz/s	52C0 Zapallar	01:13:10.731	No operó	----	----	----	------
EDAC1	49 Hz & -0,6 Hz/s	52C5 Aguas Negras	01:13:10.731	01:13:10.746	15	1,83	1,83	07/01/2016 01:27
EDAC2	48,9 Hz	Sin aplicación	------	------	------	No corresponde	No corresponde	------
EDAC3	48,8 Hz & -0,6 Hz/s	Sin aplicación	------	------	------	No corresponde	No corresponde	------
EDAC4	48,7 Hz	52C3 Rucatremo	01:13:11.038	01:13:11.048	10	2,3	2,3	07/01/2016 01:26
EDAC5	48,5 Hz	Sin aplicación	------	------	------	No corresponde	No corresponde	------
EDAC6	48,3 Hz	Sin aplicación	------	------	------	No corresponde	No corresponde	------
						Total	**4,13**	ENS=0,93 MWH

Tabla 2. La tabla resumen que indica el tiempo de activación de los escalones de frecuencia EDAC 1 y 4, los cuales provocan la apertura de los alimentadores 52C3 y 52C5 respectivamente. Además se señalan los ajustes de frecuencias para los distintos escalones y los montos de carga disponible y desconectada en MW.

En base a los registros SER y otros antecedentes aportados en los puntos anteriores, se puede concluir que la protección SEL 451, en S.E Curico, operó en forma correcta, a traves de la activación del escalón EDAC 1 y la operación del alimentador y 52C5 Aguas Negras, y del escalón EDAC 4 y la apertura del alimentador 52C3 Rucatremo. Pero no se realizó la apertura del alimentador Zapallar 52C0, aun cuando si se realizó la activación del escalon por EDAC 1 y se envió correcta orden de TRIP.

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3. ACCIONES CORRECTIVAS A CORTO PLAZO.

El dia 12 de enero a las 15:00 hrs se revisó visualmente el control SEL 351R del reconectador 52C0 alimentador Zapallar y los ajustes relacionados a la falla por EDAC 1 en SE Curicó, de lo cual visulamente no se encontró nada anormal, ya que el control se encontraba encedido y operativo con todos sus contactos correctamente conectados, por lo que se coordinó para el dia miércoles 20 de enero la revisión del alambrado de control.

Número :	SD01189/2016	Fecha :	12/01/2016
Empresa :	TRANSNET	Hora :	17:06

Instalación o Equipo a Desconectar :	CURICO_____066 Otro Elemento de Subestación : OTROS :
Descripción :	Intervención / Programada
Trabajo requiere:	Ninguno
Comentario:	Revisión de alambrado de control por no operación EDAC del interruptor 52C0 circuito Zapallar S/E Curicó.
Consumos Afectados :	Ningún Consumo Afectado
Fechas / Horas :	Inicio : 20/01/2016 - 08:00 hrs Término : 20/01/2016 - 18:00 hrs

4. ACCIONES CORRECTIVAS A LARGO PLAZO.

No Aplica

INFORME (s) CDEC Nº: **IF 00038/2016**	FECHA DE FALLA: **07 de enero 2016**
INSTALACIÓN (ES): SSEE Rauquen y Curicó	

5. CONCLUSIONES

De acuerdo a los antecedentes expuestos en los puntos anteriores, se concluye correcta la operación del esquema EDAC en S/E Rauquén, liberando carga a traves de la activación de los escalones de frecuencia EDAC 2 y EDAC 3, provocando la apertura de los alimentadores 52C2, 52C4 y 52C5.

También se concluye la correcta operación del esquema EDAC en S/E Curicó, liberando carga a través de la activación de los escalones de frecuencia EDAC 1 y EDAC 4, los cuales provocan la apertura de los alimentadores 52C5 y 52C3 respectivamente. Pero aun cuando se activó el escalon por EDAC 1 y se envió la orden de TRIP para el Circuito Zapallar 52C0, este no se abrió.

Lo anterior se produce a causa de una falla externas a instalaciones de TRANSNET, en particular se debió a falla en instalaciones de propiedad de Transelec, provocando la operación de los esquemas EDAC antes indicados.

6. ANÁLISIS CONJUNTO

El día jueves 07 de enero de 2016, a las 01:13 horas el Centro de Operaciones Transmisión (COT) informa la operación por EDAC de los circuitos 52C2, 52C4 y 52C5 de S/E Rauquén, con una potencia interrumpida de 9,03 MW y de los circuitos, 52C3 y 52C5 de S/E Curicó con una potencia interrumpida de 4,13 MW, lo que totaliza una potencia interrumpida 13,16 MW.

Posteriormente, se procede a normalizar los alimentadores de MT operados por EDAC, finalizando con la recuperación de suministro a las 02:00 horas.

INFORME (s) CDEC Nº: **IF 00038/2016**	FECHA DE FALLA: **07 de enero 2016**
INSTALACIÓN (ES): SSEE Rauquen y Curicó	

ANEXO N°1

AJUSTES RELE DE FRECUENCIA- EDAC

INFORME DE FALLA

REQUERIMIENTO NORMA TÉCNICA DE SyCS

INFORME (s) CDEC Nº: **IF 00038/2016**	FECHA DE FALLA: **07 de enero 2016**
INSTALACIÓN (ES): SSEE Rauquen y Curicó	

AJUSTES RELE DE FRECUENCIA- EDAC SE RAUQUÉN

```
Group 1
Line Configuration
CTRW    := 240      CTRX    := 240      PTRY    := 600      VNOMY   := 110
PTRZ    := 130      VNOMZ   := 106      Z1MAG   := 10.00    Z1ANG   := 85.00
Z0MAG   := 10.00    Z0ANG   := 85.00    EFLOC   := N
Relay Configuration
ESOTF   := N        ELOAD   := N        E50P    := N        E50G    := N
E50Q    := N        E51S    := N        E32     := N        ECOMM   := N
EBFL1   := N        E25BK1  := N        E79     := N        EMANCL  := N
ELOP    := N        EDEM    := N
Pole Open Detection
EPO     := 52       3POD    := 0.500
Trip Logic
TR      := NA
BK1MTR  := NA
ULTR    := NA
ULMTR1  := NA
TULO    := 1        TDUR3D  := 50.000
ER      := PSV43 OR PSV44
Global
General Global Settings
SID     := "S/E RAUQUEN"
RID     := "RELE DE FRECUENCIA"
NUMBK   := 1
BID1    := "S/E RAUQUEN"
NFREQ   := 50       PHROT   := ABC      DATE_F  := DMY
FAULT   := NA
Global Enables
EDCMON  := N        EICIS   := N        EDRSTC  := N        EGADVS  := Y
EPMU    := Y
Control Inputs
GINP    := 100      GINDF   := 80       IN1XXD  := 0.1250   IN2XXD  := 0.1250
Settings Group Selection
SS1     := NA
SS2     := NA
SS3     := NA
SS4     := NA
SS5     := NA
SS6     := NA
TGR     := 0
Frequency Estimation
EAFSRC  := NA
VF01    := VAY      VF02    := VBY      VF03    := VCY
Time-Error Calculation
STALLTE := NA
LOADTE  := NA
Current and Voltage Source Selection
ESS     := Y        LINEI   := COMB     ALINEI  := NA       BK1I    := NA
IPOL    := NA       ALINEV  := NA
```

INFORME DE FALLA

REQUERIMIENTO NORMA TÉCNICA DE SyCS

INFORME (s) CDEC Nº: **IF 00038/2016**	FECHA DE FALLA: **07 de enero 2016**
INSTALACIÓN (ES): SSEE Rauquen y Curicó	

```
Synchronized Phasor Measurement Settings
MFRMT   := C37.118  MRATE   := 2        PMAPP   := F        PHCOMP  := Y
PMSTN   := "S/E CHILLAN"
PMID    := 1
PHDATAV := V1       VCOMP   := 0.00     PHDATAI := NA       IWCOMP  := 0.00
IXCOMP  := 0.00     PHNR    := I        PHFMT   := R        FNR     := I
NUMANA  := 0        NUMDSW  := 1
TREA1   := NA
TREA2   := NA
TREA3   := NA
TREA4   := NA
PMTRIG  := NA
Output
Main Board
OUT101  := ASV101
OUT102  := ASV102
OUT103  := ASV103
OUT104  := ASV104
OUT105  := ASV105
OUT106  := ASV101 OR ASV102 OR ASV103 OR ASV104 OR ASV105 OR ASV105 OR \
           ASV106 OR ASV107 OR ASV108 OR ASV109 OR ASV110 #ALARMA POR \
           ALIMENTADOR OPERADO POR EDAC
OUT107  := PSV34 OR PSV35 #ALARMA PERDIDA DE POTENCIAL - NA - \
           PARALELO A OUT108
OUT108  := NOT HALARM AND NOT SALARM #NORMAL -CERRADO - \
           PARALELO A OUT107
Interface Board #1
OUT201  := ASV106
OUT202  := NA
OUT203  := NA
OUT204  := NA
OUT205  := NA
OUT206  := NA
OUT207  := NA
OUT208  := NA
OUT209  := NA
OUT210  := NA
OUT211  := NA
OUT212  := NA
OUT213  := NA
OUT214  := NA
OUT215  := NA
Mirrored Bits Transmit Equations
TMB1A   := NA
TMB2A   := NA
TMB3A   := NA
TMB4A   := NA
TMB5A   := NA
TMB6A   := NA
TMB7A   := NA
TMB8A   := NA
TMB1B   := NA
```

INFORME (s) CDEC Nº: **IF 00038/2016**	FECHA DE FALLA: **07 de enero 2016**
INSTALACIÓN (ES): SSEE Rauquen y Curicó	

```
TMB2B   := NA
TMB3B   := NA
TMB4B   := NA
TMB5B   := NA
TMB6B   := NA
TMB7B   := NA
TMB8B   := NA
Protection 1
1: PMV01 := -DFDT
2: PSV11 := 0.600000 < PMV01 AND FREQ < 49.000000 AND 10.000000 > PMV01
3: PCT01IN := PSV11
4: PCT01PU := 2.000000
5: PCT01DO := 50.000000
6: PSV01 := TSOK AND PCT01Q #EDAC1
7: PSV12 := FREQ < 48.900002 AND 10.000000 > PMV01
8: PCT02IN := PSV12
9: PCT02PU := 2.000000
10: PCT02DO := 50.000000
11: PSV02 := TSOK AND PCT02Q #EDAC2
12: PSV13 := 0.600000 < PMV01 AND FREQ < 48.799999 AND 10.000000 > PMV01
13: PCT03IN := PSV13
14: PCT03PU := 2.000000
15: PCT03DO := 50.000000
16: PSV03 := TSOK AND PCT03Q #EDAC3
17: PSV14 := FREQ < 48.700001 AND 10.000000 > PMV01
18: PCT04IN := PSV14
19: PCT04PU := 2.000000
20: PCT04DO := 50.000000
21: PSV04 := TSOK AND PCT04Q #EDAC4
22: PSV15 := FREQ < 48.500000 AND 10.000000 > PMV01
23: PCT05IN := PSV15
24: PCT05PU := 2.000000
25: PCT05DO := 50.000000
26: PSV05 := TSOK AND PCT05Q #EDAC5
27: PSV16 := FREQ < 48.299999 AND 10.000000 > PMV01
28: PCT06IN := PSV16
29: PCT06PU := 2.000000
30: PCT06DO := 50.000000
31: PSV06 := TSOK AND PCT06Q #EDAC6
32: PLT01S := PSV01 #TARGET LUZ EDAC1
33: PLT01R := TRGTR #RESET LUZ EDAC1
34: PLT02S := PSV02 #TARGET LUZ EDAC2
35: PLT02R := TRGTR #RESET LUZ EDAC2
36: PLT03S := PSV03 #TARGET LUZ EDAC3
37: PLT03R := TRGTR #RESET LUZ EDAC3
38: PLT04S := PSV04 #TARGET LUZ EDAC4
39: PLT04R := TRGTR #RESET LUZ EDAC4
40: PLT05S := PSV05 #TARGET LUZ EDAC5
41: PLT05R := TRGTR #RESET LUZ EDAC5
42: PLT06S := PSV06 #TARGET LUZ EDAC6
43: PLT06R := TRGTR #RESET LUZ EDAC6
44: PLT11S := ASV101 AND NOT IN101 #TARGET LUZ ALIM1
```

INFORME (s) CDEC Nº: **IF 00038/2016**	FECHA DE FALLA: **07 de enero 2016**
INSTALACIÓN (ES): SSEE Rauquen y Curicó	

```
45: PLT11R := TRGTR #RESET LUZ ALIM1
46: PLT12S := ASV102 AND NOT IN102 #TARGET LUZ ALIM2
47: PLT12R := TRGTR #RESET LUZ ALIM2
48: PLT13S := ASV103 AND NOT IN103 #TARGET LUZ ALIM3
49: PLT13R := TRGTR #RESET LUZ ALIM3
50: PLT14S := ASV104 AND NOT IN104 #TARGET LUZ ALIM4
51: PLT14R := TRGTR #RESET LUZ ALIM4
52: PLT15S := ASV105 AND NOT IN205 #TARGET LUZ ALIM5
53: PLT15R := TRGTR #RESET LUZ ALIM5
54: PLT16S := ASV106 AND NOT IN206 #TARGET LUZ ALIM6
55: PLT16R := TRGTR #RESET LUZ ALIM6
56: PLT17S := ASV107 AND NOT IN207 #TARGET LUZ ALIM7
57: PLT17R := TRGTR #RESET LUZ ALIM7
58: PLT18S := ASV108 AND NOT IN208 #TARGET LUZ ALIM8
59: PLT18R := TRGTR #RESET LUZ ALIM8
60: PSV30 := VAYM < 20.000000 OR VBYM < 20.000000 OR VCYM < 20.000000 #VY \
            CON AL MENOS UN POTENCIAL MENOS
61: PSV31 := VAYM > 20.000000 OR VBYM > 20.000000 OR VCYM > 20.000000 #VY \
            CON AL MENOS UN POTENCIAL OK
62: PSV32 := NA
63: PSV33 := NA
64: PSV34 := PSV30 #CONDICION ALARMA PERD POT PRINCIPAL
65: PSV35 := PSV31 #CONDICION ALARMA PERD POT SECUNDARIO
66: PCT07IN := PSV31 #INDICA VOLTAJE VY OK
67: PCT07PU := 500.000000 #ESPERA QUE VOLTAJE VY ESTE OK POR 10 SEG
68: PCT07DO := 500.000000 #AL MORIR VY ESPERA 10 SEG
69: PCT08IN := PSV33 #INDICA VOLTAJE VZ OK
70: PCT08PU := 500.000000 #ESPERA QUE VOLTAJE VZ ESTE OK POR 10 SEG
71: PCT08DO := 500.000000 #AL MORIR VY ESPERA 10 SEG
72: PSV20 := NOT PCT07Q AND PCT08Q #SE HACE 1 DESPUES DE 10 SEG QUE MUERE \
            VY SIEMPRE QUE VZ ESTE VIVO
73: PSV21 := PSV31 OR PSV33 #VOLTAJE VY OK O VOLTAJE VZ OK
74: PSV36 := PSV30 AND PSV32 #SIN POTENCIALES
75: PSV40 := 0.600000 >= PMV01 AND FREQ < 49.000000 #EVENTO FREQ < 49.0
76: PSV41 := 0.600000 >= PMV01 AND FREQ < 48.799999 #EVENTO FREQ < 48.8
77: PSV42 := R_TRIG PSV40 OR R_TRIG PSV41
78: PSV43 := R_TRIG PSV01 OR R_TRIG PSV02 OR R_TRIG PSV03 OR \
            R_TRIG PSV04 OR R_TRIG PSV05 OR R_TRIG PSV06 #PARA ER
79: PSV44 := R_TRIG IN101 OR R_TRIG IN102 OR R_TRIG IN103 OR \
            R_TRIG IN104 #PARA ER
80: PSV50 := R_TRIG TSOK
81: PSV51 := F_TRIG TSOK
```

INFORME DE FALLA

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INSTALACIÓN (ES): SSEE Rauquen y Curicó	

AJUSTES RELE DE FRECUENCIA- EDAC SE CURICO

```
Group 1
Line Configuration
CTRW    := 50       CTRX    := 50       PTRY    := 70       VNOMY   := 200
PTRZ    := 70       VNOMZ   := 200      Z1MAG   := 10.00    Z1ANG   := 85.00
Z0MAG   := 10.00    Z0ANG   := 85.00    EFLOC   := N
Relay Configuration
ESOTF   := N        ELOAD   := N        E50P    := N        E50G    := N
E50Q    := N        E51S    := N        E32     := N        ECOMM   := N
EBFL1   := N        E25BK1  := N        E79     := N        EMANCL  := N
ELOP    := N        EDEM    := N
Pole Open Detection
EPO     := 52       3POD    := 0.500
Trip Logic
TR      := NA
BK1MTR  := NA
ULTR    := NA
ULMTR1  := NA
TULO    := 1        TDUR3D  := 50.000
ER      := PSV43 OR PSV44
Global
General Global Settings
SID     := "S/E CURICO"
RID     := "RELE DE FRECUENCIA"
NUMBK   := 1
BID1    := "S/E CURICO"
NFREQ   := 50       PHROT   := ABC      DATE_F  := DMY
FAULT   := NA
Global Enables
EDCMON  := N        EICIS   := Y        EDRSTC  := N        EGADVS  := Y
EPMU    := Y
Control Inputs
GINDF   := 80
Main Board Control Inputs
IN101P  := 100      IN102P  := 36       IN103P  := 100      IN104P  := 36
IN105P  := 36       IN106P  := 100      IN107P  := 36       IN101PU := 0.1250
IN101DO := 0.1250   IN102PU := 0.1250   IN102DO := 0.1250   IN103PU := 0.1250
IN103DO := 0.1250   IN104PU := 0.1250   IN104DO := 0.1250   IN105PU := 0.1250
IN105DO := 0.1250   IN106PU := 0.1250   IN106DO := 0.1250   IN107PU := 0.1250
IN107DO := 0.1250
Interface Board # 1 Control Inputs
IN201P  := 36       IN202P  := 36       IN203P  := 36       IN204P  := 36
IN205P  := 36       IN206P  := 36       IN207P  := 36       IN208P  := 36
IN201PU := 0.1250   IN201DO := 0.1250   IN202PU := 0.1250   IN202DO := 0.1250
IN203PU := 0.1250   IN203DO := 0.1250   IN204PU := 0.1250   IN204DO := 0.1250
IN205PU := 0.1250   IN205DO := 0.1250   IN206PU := 0.1250   IN206DO := 0.1250
IN207PU := 0.1250   IN207DO := 0.1250   IN208PU := 0.1250   IN208DO := 0.1250
```

INFORME DE FALLA

REQUERIMIENTO NORMA TÉCNICA DE SyCS

INFORME (s) CDEC Nº: **IF 00038/2016**	FECHA DE FALLA: **07 de enero 2016**
INSTALACIÓN (ES): SSEE Rauquen y Curicó	

```
Settings Group Selection
SS1     := NA
SS2     := NA
SS3     := NA
SS4     := NA
SS5     := NA
SS6     := NA
TGR     := 0
Frequency Estimation
EAFSRC  := NA
VF01    := VAY      VF02    := VBY      VF03    := VCY
Time-Error Calculation
STALLTE := NA
LOADTE  := NA
Current and Voltage Source Selection
ESS     := Y        LINEI   := COMB     ALINEI  := NA       BK1I    := NA
IPOL    := NA       ALINEV  := NA
Synchronized Phasor Measurement Settings
MFRMT   := C37.118  MRATE   := 2        PMAPP   := F        PHCOMP  := Y
PMSTN   := "S/E CHILLAN"
PMID    := 1
PHDATAV := V1       VCOMP   := 0.00     PHDATAI := NA       IWCOMP  := 0.00
IXCOMP  := 0.00     PHNR    := I        PHFMT   := R        FNR     := I
NUMANA  := 0        NUMDSW  := 1
TREA1   := NA
TREA2   := NA
TREA3   := NA
TREA4   := NA
PMTRIG  := NA
Output
Main Board
OUT101  := ASV101
OUT102  := ASV102
OUT103  := ASV103
OUT104  := ASV104
OUT105  := ASV105
OUT106  := ASV101 OR ASV102 OR ASV103 OR ASV104 OR ASV105 OR ASV105 OR \
           ASV106 OR ASV107 OR ASV108 OR ASV109 OR ASV110 #ALARMA POR \
           ALIMENTADOR OPERADO POR EDAC
OUT107  := PSV34 #ALARMA PERDIDA DE POTENCIAL - NA - PARALELO A OUT108
OUT108  := NOT HALARM AND NOT SALARM #NORMAL -CERRADO - \
           PARALELO A OUT107
Interface Board #1
OUT201  := ASV106
OUT202  := ASV107
OUT203  := NA
OUT204  := NA
OUT205  := NA
OUT206  := NA
OUT207  := NA
OUT208  := NA
OUT209  := NA
```

INFORME (s) CDEC Nº: **IF 00038/2016**	FECHA DE FALLA: **07 de enero 2016**
INSTALACIÓN (ES): SSEE Rauquen y Curicó	

```
OUT210  := NA
OUT211  := NA
OUT212  := NA
OUT213  := NA
OUT214  := NA
OUT215  := NA
Mirrored Bits Transmit Equations
TMB1A   := NA
TMB2A   := NA
TMB3A   := NA
TMB4A   := NA
TMB5A   := NA
TMB6A   := NA
TMB7A   := NA
TMB8A   := NA
TMB1B   := NA
TMB2B   := NA
TMB3B   := NA
TMB4B   := NA
TMB5B   := NA
TMB6B   := NA
TMB7B   := NA
TMB8B   := NA
Protection 1
1: PMV01 := -DFDT
2: PSV11 := 0.600000 < PMV01 AND FREQ < 49.000000 AND 10.000000 > PMV01
3: PCT01IN := PSV11
4: PCT01PU := 2.000000
5: PCT01DO := 50.000000
6: PSV01 := TSOK AND PCT01Q #EDAC1
7: PSV12 := FREQ < 48.900002 AND 10.000000 > PMV01
8: PCT02IN := PSV12
9: PCT02PU := 2.000000
10: PCT02DO := 50.000000
11: PSV02 := TSOK AND PCT02Q #EDAC2
12: PSV13 := 0.600000 < PMV01 AND FREQ < 48.799999 AND 10.000000 > PMV01
13: PCT03IN := PSV13
14: PCT03PU := 2.000000
15: PCT03DO := 50.000000
16: PSV03 := TSOK AND PCT03Q #EDAC3
17: PSV14 := FREQ < 48.700001 AND 10.000000 > PMV01
18: PCT04IN := PSV14
19: PCT04PU := 2.000000
20: PCT04DO := 50.000000
21: PSV04 := TSOK AND PCT04Q #EDAC4
22: PSV15 := FREQ < 48.500000 AND 10.000000 > PMV01
23: PCT05IN := PSV15
24: PCT05PU := 2.000000
25: PCT05DO := 50.000000
26: PSV05 := TSOK AND PCT05Q #EDAC5
27: PSV16 := FREQ < 48.299999 AND 10.000000 > PMV01
28: PCT06IN := PSV16
```

INFORME (s) CDEC Nº: **IF 00038/2016**	FECHA DE FALLA: **07 de enero 2016**
INSTALACIÓN (ES): SSEE Rauquen y Curicó	

```
29: PCT06PU := 2.000000
30: PCT06DO := 50.000000
31: PSV06 := TSOK AND PCT06Q #EDAC6
32: PLT01S := PSV01 #TARGET LUZ EDAC1
33: PLT01R := TRGTR #RESET LUZ EDAC1
34: PLT02S := PSV02 #TARGET LUZ EDAC2
35: PLT02R := TRGTR #RESET LUZ EDAC2
36: PLT03S := PSV03 #TARGET LUZ EDAC3
37: PLT03R := TRGTR #RESET LUZ EDAC3
38: PLT04S := PSV04 #TARGET LUZ EDAC4
39: PLT04R := TRGTR #RESET LUZ EDAC4
40: PLT05S := PSV05 #TARGET LUZ EDAC5
41: PLT05R := TRGTR #RESET LUZ EDAC5
42: PLT06S := PSV06 #TARGET LUZ EDAC6
43: PLT06R := TRGTR #RESET LUZ EDAC6
44: PLT11S := ASV101 AND NOT IN101 #TARGET LUZ ALIM1
45: PLT11R := TRGTR #RESET LUZ ALIM1
46: PLT12S := ASV102 AND NOT IN102 #TARGET LUZ ALIM2
47: PLT12R := TRGTR #RESET LUZ ALIM2
48: PLT13S := ASV103 AND NOT IN103 #TARGET LUZ ALIM3
49: PLT13R := TRGTR #RESET LUZ ALIM3
50: PLT14S := ASV104 AND NOT IN104 #TARGET LUZ ALIM4
51: PLT14R := TRGTR #RESET LUZ ALIM4
52: PLT15S := ASV105 AND NOT IN105 #TARGET LUZ ALIM5
53: PLT15R := TRGTR #RESET LUZ ALIM5
54: PLT16S := ASV106 AND NOT IN201 #TARGET LUZ ALIM6
55: PLT16R := TRGTR #RESET LUZ ALIM6
56: PLT17S := ASV107 AND NOT IN207 #TARGET LUZ ALIM7
57: PLT17R := TRGTR #RESET LUZ ALIM7
58: PLT18S := ASV108 AND NOT IN208 #TARGET LUZ ALIM8
59: PLT18R := TRGTR #RESET LUZ ALIM8
60: PSV30 := VAYM < 20.000000 OR VBYM < 20.000000 OR VCYM < 20.000000 #VY \
             PERDIDA DE VOLTAJES
61: PSV31 := NA
62: PSV32 := NA
63: PSV33 := NA
64: PSV34 := PSV30
65: PSV35 := NA
66: PCT07IN := PSV31 #INDICA VOLTAJE VY OK
67: PCT07PU := 500.000000 #ESPERA QUE VOLTAJE VY ESTE OK POR 10 SEG
68: PCT07DO := 500.000000 #AL MORIR VY ESPERA 10 SEG
69: PCT08IN := PSV33 #INDICA VOLTAJE VZ OK
70: PCT08PU := 500.000000 #ESPERA QUE VOLTAJE VZ ESTE OK POR 10 SEG
71: PCT08DO := 500.000000 #AL MORIR VY ESPERA 10 SEG
72: PSV20 := NOT PCT07Q AND PCT08Q #SE HACE 1 DESPUES DE 10 SEG QUE MUERE \
             VY SIEMPRE QUE VZ ESTE  VIVO
73: PSV21 := PSV31 OR PSV33 #VOLTAJE VY O VZ OK
74: PSV36 := PSV30 AND PSV32 #SIN POTENCIALES
75: PSV40 := 0.600000 >= PMV01 AND FREQ < 49.000000 #EVENTO FREQ <49.0
76: PSV41 := 0.600000 >= PMV01 AND FREQ < 48.799999 #EVENTO FREQ <48.8
77: PSV42 := R_TRIG PSV40 OR R_TRIG PSV41
78: PSV43 := R_TRIG PSV01 OR R_TRIG PSV02 OR R_TRIG PSV03 OR \
```

INFORME DE FALLA

REQUERIMIENTO NORMA TÉCNICA DE SyCS

INFORME (s) CDEC Nº: **IF 00038/2016**	FECHA DE FALLA: **07 de enero 2016**
INSTALACIÓN (ES): SSEE Rauquen y Curicó	

```
             R_TRIG PSV04 OR R_TRIG PSV05 OR R_TRIG PSV06 #PARA ER
79: PSV44 := R_TRIG IN201 OR R_TRIG IN101 OR R_TRIG IN102 OR \
             R_TRIG IN103 OR R_TRIG IN104 OR R_TRIG IN105 #PARA ER
80: PSV50 := R_TRIG TSOK
81: PSV51 := F_TRIG TSOK
```

INFORME (s) CDEC Nº: **IF 00038/2016**	FECHA DE FALLA: **07 de enero 2016**
INSTALACIÓN (ES): SSEE Rauquen y Curicó	

ANEXO N°2

REGISTRO SCADA

TRANSNET
GRUPO CGE

INFORME DE FALLA

REQUERIMIENTO NORMA TÉCNICA DE SyCS

INFORME (s) CDEC Nº: **IF 00038/2016**	FECHA DE FALLA: **07 de enero 2016**
INSTALACIÓN (ES): SSEE Rauquen y Curicó	

07-01-2016	01:13:18.9	COS	Abierto	Curicó_15_ST_Abierto_52C3	CU_ESTADO_ABIERTO_52C3
07-01-2016	01:13:18.9	COS	Abierto	Curicó_15_ST_Abierto_52C5	CU_ESTADO_ABIERTO_52C5
07-01-2016	01:13:18.9	COS	Abierto	Rauquén_15_ST_Abierto_52C2	RU_ESTADO_ABIERTO_52C2
07-01-2016	01:13:18.9	COS	Abierto	Rauquén_15_ST_Abierto_52C5	RU_ESTADO_ABIERTO_52C5
07-01-2016	01:13:22.7	COS	Abierto	Rauqueén_15_ST_Abierto_52C4	RU_ESTADO_ABIERTO_52C4
07-01-2016	01:23:56.6	COS	Cerrado	Rauquén_15_ST_Cerrado_52C2	RU_ESTADO_CERRADO_52C2
07-01-2016	01:25:34.8	COS	Cerrado	Curicó_15_ST_Cerrado_52C3	CU_ESTADO_CERRADO_52C3
07-01-2016	01:27:18.5	COS	Cerrado	Curicó_15_ST_Cerrado_52C5	CU_ESTADO_CERRADO_52C5
07-01-2016	01:30:18.8	COS	Cerrado	Rauquén_15_ST_Cerrado_52C4	RU_ESTADO_CERRADO_52C4
07-01-2016	01:59:46.6	COS	Cerrado	Rauquén_15_ST_Cerrado_52C5	RU_ESTADO_CERRADO_52C5

INFORME (s) CDEC Nº: **IF N° 00039/2016**	FECHA DE FALLA: **07 de Enero de 2016**
INSTALACIÓN EDAC Baja Frecuencia SSSE Colchagua.	

1. CAUSA U ORIGEN DE LA FALLA:

1.1. Fecha y hora de la Falla:

Fecha	**07 de enero de 2016**
Hora	01:13

1.2. Localización de la falla:

Externa a las instalaciones de Transnet, que de acuerdo a lo informado por medios oficiales del CDEC-SIC, la falla se localizó en las líneas de 154 kV Tinguiririca – Rancagua – Alto Jahuel N°1 y N°2 de propiedad de Transelec.

1.3. Causa de la Falla:

Falla externa a instalaciones de Transnet, que de acuerdo a lo informado por medios oficiales del CDEC-SIC, la falla se localizó en las líneas de 154 kV Tinguiririca – Rancagua – Alto Jahuel N°1 y N°2 de propiedad de Transelec. Lo anterior provoca la inestabilidad del sistema generando la operación del EDAC.

1.4. Código falla:

Causas de Falla	**Código**	**Descripción**
Fenómeno Físico	(*)	-
Elemento del Sistema Eléctrico	(*)	-
Fenómeno Eléctrico	FR81	Frecuencia
Modo	13	Opera según lo esperado

(*) La falla se produjo en la línea 154 kV Alto Jahuel – Rancagua – Tinguiririca N°1 y N°2, de propiedad de TRANSELEC. No corresponde a Transnet pronunciarse sobre falla en instalaciones de terceros.

1.5. Comuna donde se originó la falla:

Comuna_ID	**Nombre Comuna**	**Provincia**	**Región**
6301	San Fernando	Colchagua	Región del Libertador

1.6. Reiteración

No hay

INFORME (s) CDEC Nº: **IF N° 00039/2016**	FECHA DE FALLA: **07 de Enero de 2016**
INSTALACIÓN EDAC Baja Frecuencia SSSE Colchagua.	

RESUMEN DE OPERACIÓN DE ESQUEMA EDAC ZONA DE CACHAPOAL

CONSUMO TOTAL PREVIO A LA OPER. EDAC(MW)	**344 MW**
DESPRENDIMIENTO TOTAL ZONA CACHAPOAL (MW)	**9,92 MW**
DESPRENDIMIENTO ZONA CACHAPOAL (%)	**2,88 %**

INFORME (s) CDEC Nº: **IF N° 00039/2016**	FECHA DE FALLA: **07 de Enero de 2016**
INSTALACIÓN EDAC Baja Frecuencia SSSE Colchagua.	

SUBESTACION COLCHAGUA.

REGISTROS DE FRECUENCIA
EDAC N°3

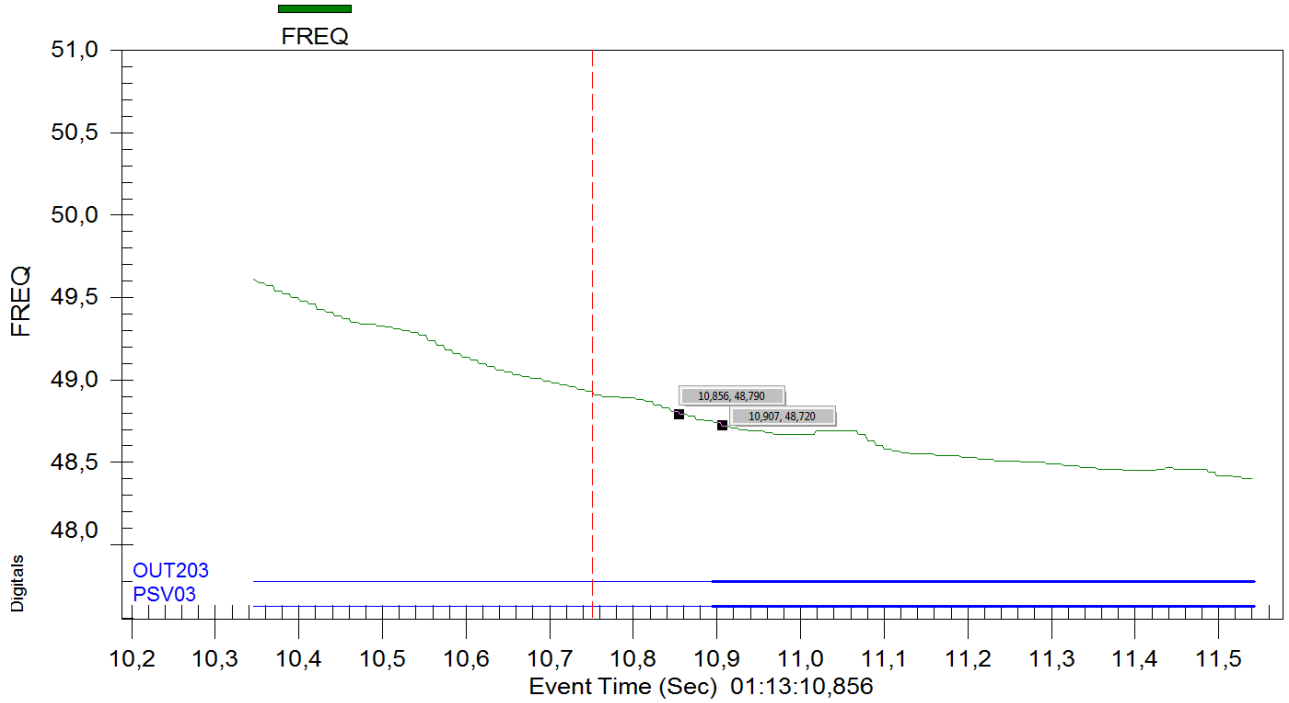


Figura N°1. Oscilografía de operación EDAC escalón N°3

La oscilografía anterior muestra las variables de interés para analizar el evento en cuestión. La descripción de cada una de ellas es la siguiente:

- PSV03: Activación Escalón EDAC 3
- OUT203: Escalón EDAC 3, orden de apertura Circuito Enap (52C3) y Circuito Maggi (52C5).

Se observa que la frecuencia cae bajo el umbral de activación del escalón EDAC N°3 de 48.79 Hz y -0.6 df/dt.

- Valores de df/dt registrados en EDAC 3

$$\frac{\Delta f}{\Delta t} = \frac{(48{,}72 - 48{,}79)Hz}{(10.907 - 10{,}856)s} = -1{,}37 \quad [Hz/s]$$

INFORME (s) CDEC Nº: **IF N° 00039/2016**	FECHA DE FALLA: **07 de Enero de 2016**
INSTALACIÓN EDAC Baja Frecuencia SSSE Colchagua.	

EDAC N°5

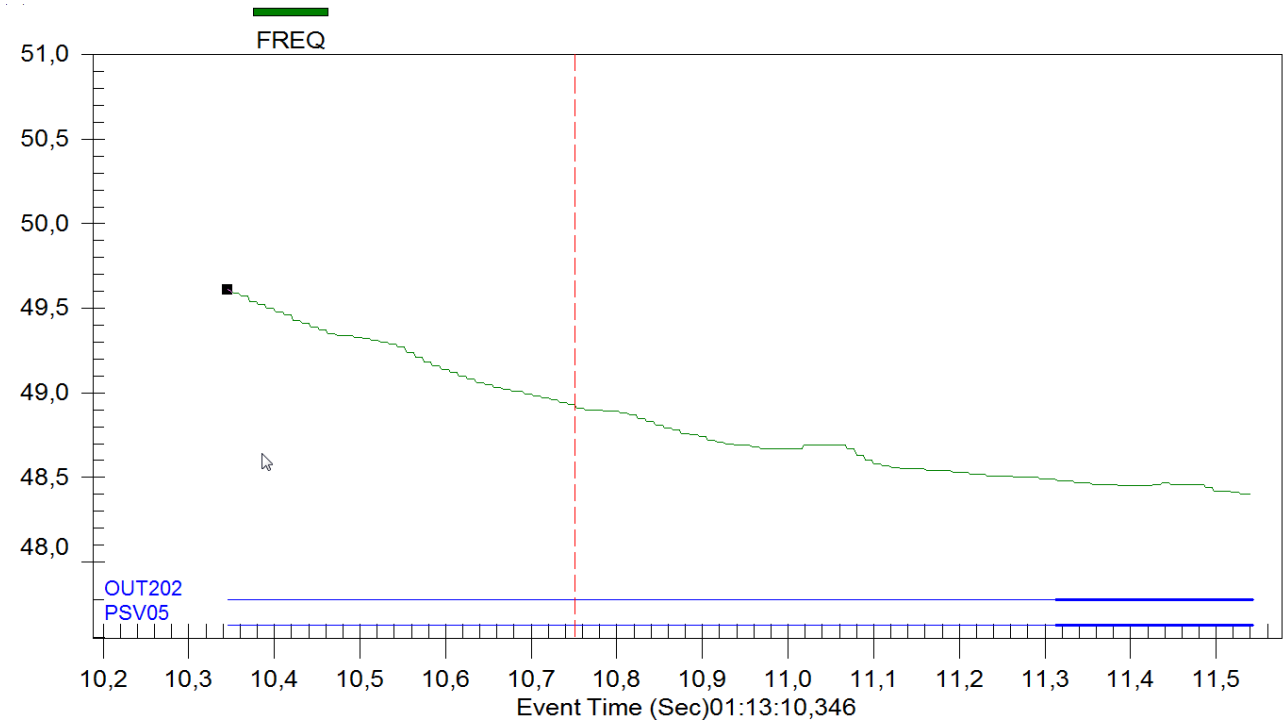


Figura N°2. Oscilografía de operación EDAC escalón N°5

La oscilografía anterior muestra las variables de interés para analizar el evento en cuestión. La descripción de cada una de ellas es la siguiente:

- PSV05: Activación Escalón EDAC 5
- OUT202: Escalón EDAC 5, orden de apertura Circuito Tinguiririca (52C2).

INFORME (s) CDEC Nº: **IF N° 00039/2016**	FECHA DE FALLA: **07 de Enero de 2016**
INSTALACIÓN EDAC Baja Frecuencia SSSE Colchagua.	

EDAC N°6

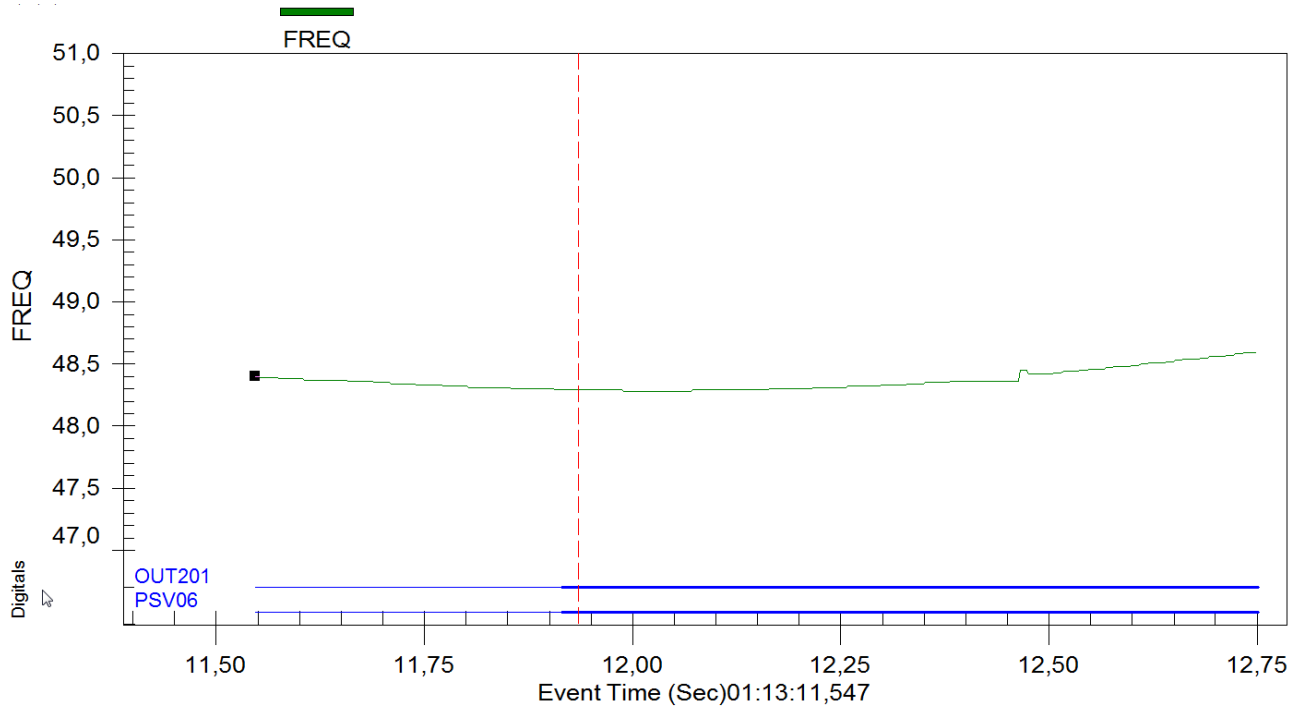


Figura N°3. Oscilografía de operación EDAC escalón N°6

La oscilografía anterior muestra las variables de interés para analizar el evento en cuestión. La descripción de cada una de ellas es la siguiente:

- PSV06: Activación Escalón EDAC 6
- OUT201: Escalón EDAC 6, orden de apertura Circuito Miraflores (52C1).

INFORME (s) CDEC Nº: **IF N° 00039/2016**	FECHA DE FALLA: **07 de Enero de 2016**
INSTALACIÓN EDAC Baja Frecuencia SSSE Colchagua.	

A. REGISTROS DE EVENTOS SER RELE SEL-451 EDAC BF

=>SER 250

RELE DE FRECUENCIA Date: 12/01/2016 Time: 17:02:45.326
SE COLCHAGUA Serial Number: 2006076077

FID=SEL-451-1-R200-V0-Z004004-D20060814

#	DATE	TIME	ELEMENT	STATE
147	06/01/2016	08:00:00.003	OP-00-08HR	Deasserted
146	07/01/2016	00:00:00.003	OP-00-08HR	Asserted
145	07/01/2016	01:13:10.693	EDAC1	Asserted
144	07/01/2016	01:13:10.733	EDAC1T	Asserted
143	07/01/2016	01:13:10.751	ER	Asserted
142	07/01/2016	01:13:10.751	ASV012	Asserted
141	07/01/2016	01:13:10.751	ASV014	Asserted
140	07/01/2016	01:13:10.756	ER	Deasserted
139	07/01/2016	01:13:10.756	ASV012	Deasserted
138	07/01/2016	01:13:10.756	ASV014	Deasserted
137	07/01/2016	01:13:10.774	EDAC2	Asserted
136	07/01/2016	01:13:10.815	EDAC2T	Asserted
135	07/01/2016	01:13:10.830	ER	Asserted
134	07/01/2016	01:13:10.830	ASV012	Asserted
133	07/01/2016	01:13:10.830	ASV014	Asserted
132	07/01/2016	01:13:10.835	ER	Deasserted
131	07/01/2016	01:13:10.835	ASV012	Deasserted
130	07/01/2016	01:13:10.835	ASV014	Deasserted
129	07/01/2016	01:13:10.856	EDAC3	Asserted
128	07/01/2016	01:13:10.897	EDAC3T	Asserted
127	07/01/2016	01:13:10.897	OUT106	Asserted
126	07/01/2016	01:13:10.897	OUT203	Asserted
125	07/01/2016	01:13:10.897	OUT205	Asserted
124	07/01/2016	01:13:10.915	ER	Asserted
123	07/01/2016	01:13:10.915	ASV011	Asserted
122	07/01/2016	01:13:10.915	ASV014	Asserted
121	07/01/2016	01:13:10.920	ER	Deasserted
120	07/01/2016	01:13:10.920	ASV011	Deasserted
119	07/01/2016	01:13:10.920	ASV014	Deasserted
118	07/01/2016	01:13:10.938	EDAC4	Asserted
117	07/01/2016	01:13:10.979	EDAC4T	Asserted
116	07/01/2016	01:13:10.992	ER	Asserted
115	07/01/2016	01:13:10.992	ASV012	Asserted
114	07/01/2016	01:13:10.992	ASV014	Asserted

INFORME (s) CDEC Nº: **IF N° 00039/2016**	FECHA DE FALLA: **07 de Enero de 2016**
INSTALACIÓN EDAC Baja Frecuencia SSSE Colchagua.	

113	07/01/2016	01:13:10.999	ER	Deasserted
112	07/01/2016	01:13:10.999	ASV012	Deasserted
111	07/01/2016	01:13:10.999	ASV014	Deasserted
110	07/01/2016	01:13:11.004	IN203	Asserted
109	07/01/2016	01:13:11.007	IN205	Asserted
108	07/01/2016	01:13:11.017	52C3.ENAP	Deasserted
107	07/01/2016	01:13:11.017	52C5.MAGGI	Deasserted
106	07/01/2016	01:13:11.017	ASV013	Deasserted
105	07/01/2016	01:13:11.025	FREQ<49.0_DFDT=<0.6	Asserted
104	07/01/2016	01:13:11.025	FREQ<48.8_DFDT=<0.6	Asserted
103	07/01/2016	01:13:11.025	EDAC1	Deasserted
102	07/01/2016	01:13:11.025	EDAC3	Deasserted
101	07/01/2016	01:13:11.040	ASV012	Asserted
100	07/01/2016	01:13:11.048	ASV012	Deasserted
99	07/01/2016	01:13:11.123	EDAC1	Asserted
98	07/01/2016	01:13:11.123	EDAC3	Asserted
97	07/01/2016	01:13:11.123	FREQ<49.0_DFDT=<0.6	Deasserted
96	07/01/2016	01:13:11.123	FREQ<48.8_DFDT=<0.6	Deasserted
95	07/01/2016	01:13:11.246	FREQ<49.0_DFDT=<0.6	Asserted
94	07/01/2016	01:13:11.246	FREQ<48.8_DFDT=<0.6	Asserted
93	07/01/2016	01:13:11.246	EDAC1	Deasserted
92	07/01/2016	01:13:11.246	EDAC3	Deasserted
91	07/01/2016	01:13:11.261	ASV012	Asserted
90	07/01/2016	01:13:11.269	ASV012	Deasserted
89	07/01/2016	01:13:11.277	EDAC5	Asserted
88	07/01/2016	01:13:11.318	EDAC5T	Asserted
87	07/01/2016	01:13:11.318	OUT202	Asserted
86	07/01/2016	01:13:11.336	ER	Asserted
85	07/01/2016	01:13:11.336	ASV011	Asserted
84	07/01/2016	01:13:11.336	ASV014	Asserted
83	07/01/2016	01:13:11.341	ER	Deasserted
82	07/01/2016	01:13:11.341	ASV011	Deasserted
81	07/01/2016	01:13:11.341	ASV014	Deasserted
80	07/01/2016	01:13:11.473	IN202	Asserted
79	07/01/2016	01:13:11.486	52C2.TINGUIRIRICA	Deasserted
78	07/01/2016	01:13:11.622	EDAC1	Asserted
77	07/01/2016	01:13:11.622	EDAC3	Asserted
76	07/01/2016	01:13:11.622	FREQ<49.0_DFDT=<0.6	Deasserted
75	07/01/2016	01:13:11.622	FREQ<48.8_DFDT=<0.6	Deasserted
74	07/01/2016	01:13:11.664	FREQ<49.0_DFDT=<0.6	Asserted
73	07/01/2016	01:13:11.664	FREQ<48.8_DFDT=<0.6	Asserted
72	07/01/2016	01:13:11.664	EDAC1	Deasserted
71	07/01/2016	01:13:11.664	EDAC3	Deasserted
70	07/01/2016	01:13:11.677	ASV012	Asserted
69	07/01/2016	01:13:11.682	ASV012	Deasserted

INFORME (s) CDEC Nº: **IF N° 00039/2016**	FECHA DE FALLA: **07 de Enero de 2016**
INSTALACIÓN EDAC Baja Frecuencia SSSE Colchagua.	

68	07/01/2016	01:13:11.876	EDAC6	Asserted
67	07/01/2016	01:13:11.917	EDAC6T	Asserted
66	07/01/2016	01:13:11.917	OUT201	Asserted
65	07/01/2016	01:13:11.935	ER	Asserted
64	07/01/2016	01:13:11.935	ASV011	Asserted
63	07/01/2016	01:13:11.935	ASV014	Asserted
62	07/01/2016	01:13:11.940	ER	Deasserted
61	07/01/2016	01:13:11.940	ASV011	Deasserted
60	07/01/2016	01:13:11.940	ASV014	Deasserted
59	07/01/2016	01:13:12.197	EDAC6	Deasserted
58	07/01/2016	01:13:12.461	IN201	Asserted
57	07/01/2016	01:13:12.471	52C1.MIRAFLORES	DEASSERTED
56	07/01/2016	01:13:12.621	EDAC5	Deasserted
55	07/01/2016	01:13:12.698	EDAC1T	Deasserted
54	07/01/2016	01:13:12.698	EDAC3T	Deasserted
53	07/01/2016	01:13:12.698	OUT203	Deasserted
52	07/01/2016	01:13:12.698	OUT205	Deasserted
51	07/01/2016	01:13:12.909	EDAC4	Deasserted
50	07/01/2016	01:13:13.094	FREQ<48.8_DFDT=<0.6	Deasserted
49	07/01/2016	01:13:13.227	EDAC6T	Deasserted
48	07/01/2016	01:13:13.227	OUT201	Deasserted
47	07/01/2016	01:13:13.406	EDAC2	Deasserted
46	07/01/2016	01:13:13.646	EDAC5T	Deasserted
45	07/01/2016	01:13:13.646	OUT106	Deasserted
44	07/01/2016	01:13:13.646	OUT202	Deasserted
43	07/01/2016	01:13:13.933	EDAC4T	Deasserted
42	07/01/2016	01:13:14.428	EDAC2T	Deasserted
41	07/01/2016	01:13:14.484	EDAC2	Asserted
40	07/01/2016	01:13:14.525	EDAC2T	Asserted
39	07/01/2016	01:13:14.541	ASV012	Asserted
38	07/01/2016	01:13:14.548	ASV012	Deasserted
37	07/01/2016	01:13:14.965	FREQ<48.8_DFDT=<0.6	Asserted
36	07/01/2016	01:13:14.981	ASV012	Asserted
35	07/01/2016	01:13:14.988	ASV012	Deasserted
34	07/01/2016	01:13:15.970	FREQ<48.8_DFDT=<0.6	Deasserted
33	07/01/2016	01:13:16.420	EDAC2	Deasserted
32	07/01/2016	01:13:16.793	FREQ<49.0_DFDT=<0.6	Deasserted
31	07/01/2016	01:13:17.441	EDAC2T	Deasserted
30	07/01/2016	01:22:24.130	IN203	Deasserted
29	07/01/2016	01:22:24.142	52C3.ENAP	Asserted
28	07/01/2016	01:22:29.616	IN205	Deasserted
27	07/01/2016	01:22:29.626	52C5.MAGGI	Asserted
26	07/01/2016	01:30:45.905	IN202	Deasserted
25	07/01/2016	01:30:45.913	52C2.TINGUIRIRICA	Asserted
24	07/01/2016	01:37:52.668	IN201	Deasserted

INFORME (s) CDEC Nº: **IF N° 00039/2016**	FECHA DE FALLA: **07 de Enero de 2016**
INSTALACIÓN EDAC Baja Frecuencia SSSE Colchagua.	

23	07/01/2016	01:37:52.678	52C1.MIRAFLORES	Asserted
22	07/01/2016	01:37:52.678	ASV013	Asserted
21	07/01/2016	08:00:00.002	OP-00-08HR	Deasserted
20	08/01/2016	00:00:00.002	OP-00-08HR	Asserted
19	08/01/2016	08:00:00.003	OP-00-08HR	Deasserted
18	08/01/2016	08:01:28.872	IN204	Asserted
17	08/01/2016	08:01:28.885	52C4.OHIGGINS	Deasserted
16	08/01/2016	08:01:29.127	IN204	Deasserted
15	08/01/2016	08:01:29.137	52C4.OHIGGINS	Asserted
14	09/01/2016	00:00:00.002	OP-00-08HR	Asserted
13	09/01/2016	08:00:00.002	OP-00-08HR	Deasserted
12	10/01/2016	00:00:00.004	OP-00-08HR	Asserted
11	10/01/2016	08:00:00.003	OP-00-08HR	Deasserted
10	11/01/2016	00:00:00.004	OP-00-08HR	Asserted
9	11/01/2016	08:00:00.004	OP-00-08HR	Deasserted
8	11/01/2016	10:58:25.784	SEL2407_OK	Deasserted
7	11/01/2016	10:59:40.792	SEL2407_OK	Asserted
6	11/01/2016	10:59:40.804	SEL2407_OK	Deasserted
5	11/01/2016	10:59:42.993	SEL2407_OK	Asserted
4	11/01/2016	10:59:43.093	SEL2407_OK	Deasserted
3	11/01/2016	10:59:43.605	SEL2407_OK	Asserted
2	12/01/2016	00:00:00.004	OP-00-08HR	Asserted
1	12/01/2016	08:00:00.003	OP-00-08HR	Deasserted

Los registros SER muestran la correcta operación de la protección de frecuencia. A continuación se presentan la descripción de los registros destacados.

Registro 129: Se activó Escalón 3.
Registro 126: Escalón EDAC 3, orden de apertura Circuito Enap (52C3) y Circuito Maggi (52C5).

Registro 89: Se activó Escalón 5
Registro 87: escalón EDAC 5, orden de apertura Circuito Tinguiririca (52C2)

Registro 68: Se activó Escalón 6
Registro 66: Escalón EDAC 6, orden de apertura Circuito Miraflores (52C1).

INFORME (s) CDEC Nº: **IF N° 00039/2016**	FECHA DE FALLA: **07 de Enero de 2016**
INSTALACIÓN EDAC Baja Frecuencia SSSE Colchagua.	

A. RESUMEN DE OPERACIÓN EDAC

De acuerdo a la oscilografía anterior y los registros SER, puede establecerse la siguiente secuencia de operación:

Escalón EDAC	Ajuste Frecuencia	Alimentador	Hora Activación Escalón	Hora Desconexión Escalón (alimentador)	Tiempo de operación Escalón (ms)	Monto de carga desconectada MW	Tasa Variación de frecuencia (calculado)	Hora de recuperación de consumos
EDAC 3	48.79Hz & 0.6Hz/s	52C3 Cto. Enap	01:13:10:856	01:13:10:897	41	1,73	- 1.37 Hz/s	01:22
EDAC 3	48.79Hz & 0.6Hz/s	52C5 Cto. Maggi	01:13:10:856	01:13:10:897	41	3,13	- 1.37 Hz/s	01:22
EDAC 5	48,5 Hz	52C2 Cto. Tinguiririca	01:13:11:277	01:13:11:318	41	1,95	-	01:31
EDAC 6	48,29 HZ	52C1 Cto. Miraflores	01:13:10:876	01:13:11:917	41	3,11	-	01:38
					Total	**9,92**		

INFORME (s) CDEC Nº: **IF N° 00039/2016**	FECHA DE FALLA: **07 de Enero de 2016**
INSTALACIÓN EDAC Baja Frecuencia SSSE Colchagua.	

2. CONCLUSIONES

De acuerdo a los antecedentes expuestos en los puntos anteriores, se concluye correcta la operación del EDAC en SE Colchagua en su escalón N° 3, correspondiente a los alimentadores ENAP (52C3) y Maggi (52C5), en su escalón N°5, correspondiente al alimentador Tinguiririca (52C2) y en su escalón N°6, correspondiente al alimentador Miraflores (52C1), desconectando un total de 9,92 MW de consumos de clientes finales asociados a CGED.

Lo anterior se produce a causa de una falla externas a instalaciones de TRANSNET, en particular se debió a falla en instalaciones de propiedad de Transelec, provocando la operación de los esquemas EDAC antes indicados.

3. ANÁLISIS CONJUNTO

El día Jueves 07 de Enero de 2016, a las 01:13 horas se produce la operación del esquema EDAC de Baja Frecuencia sobre los alimentadores, Miraflores 52C1, Tinguiririca 52C2, ENAP 52C3 y Maggi 52C5 de SSEE Colchagua producto de la falla en las líneas 154KV Tinguiririca – Rancagua – Alto Jahuel N°1 y N°2, propiedad de Transelec.

Posteriormente en coordinación con el CDC del CDEC-SIC se procede a normalizar los circuitos operados por EDAC BF quedando restituido el servicio en su totalidad a las 01:38 horas.

INFORME (s) CDEC Nº: **IF N° 00039/2016**	FECHA DE FALLA: **07 de Enero de 2016**
INSTALACIÓN EDAC Baja Frecuencia SSSE Colchagua.	

ANEXO N°1

ESTAMPA DE TIEMPO SINCRONIZADA

INFORME (s) CDEC Nº: **IF N° 00039/2016**	FECHA DE FALLA: **07 de Enero de 2016**
INSTALACIÓN EDAC Baja Frecuencia SSSE Colchagua.	

S/E Colchagua

Eventos

		Fecha Termino:	
Fecha Inicio:	1/7/2016		1/7/2016
Hora Inicio:	00:00:00.000	Hora Termino:	23:59:59.999
Zona:	San Fernando	SE:	Colchagua

SE	Fecha	Hora	Estado	Descripcion
Colchagua	2016/01/07	01:13:10.000	1	Colchagua_ST_abierto 52C5 Maggi
Colchagua	2016/01/07	01:13:10.998	1	Colchagua_ST_abierto 52C3 ENAP
Colchagua	2016/01/07	01:13:11.466	1	Colchagua_ST_abierto 52 C2
Colchagua	2016/01/07	01:13:12.455	1	Colchagua_ST_abierto 52C1
Colchagua	2016/01/07	01:22:24.144	1	Colchagua_ST_cerrado 52C3 ENAP
Colchagua	2016/01/07	01:22:29.620	1	Colchagua_ST_cerrado 52C5 Maggi
Colchagua	2016/01/07	01:30:45.913	1	Colchagua_ST_cerrado 52C2
Colchagua	2016/01/07	01:37:52.680	1	Colchagua_ST_cerrado 52 C1

1-19-2016 3:07:59 PM

INFORME (s) CDEC Nº: **IF N° 00039/2016**	FECHA DE FALLA: **07 de Enero de 2016**
INSTALACIÓN EDAC Baja Frecuencia SSSE Colchagua.	

ANEXO N°2

Setting relé SEL-451
ESQUEMA EDAC SSEE COLCHAGUA

INFORME (s) CDEC Nº: **IF N° 00039/2016**	FECHA DE FALLA: **07 de Enero de 2016**
INSTALACIÓN EDAC Baja Frecuencia SSSE Colchagua.	

```
=>>SHO S 1
Group 1

Line Configuration

CTRW    := 240      CTRX    := 240      PTRY    := 130      VNOMY   := 120
PTRZ    := 130      VNOMZ   := 120      Z1MAG   := 10.00    Z1ANG   := 85.00
Z0MAG   := 10.00    Z0ANG   := 85.00    EFLOC   := N

Relay Configuration

ESOTF   := N        ELOAD   := N        E50P    := N        E50G    := N
E50Q    := N        E51S    := N        E32     := N        ECOMM   := N
EBFL1   := N        E25BK1  := N        E79     := N        EMANCL  := N
ELOP    := Y        EDEM    := N

Pole Open Detection

EPO     := 52       3POD    := 0.500

Trip Logic

TR      := NA
BK1MTR  := NA
ULTR    := NA
ULMTR1  := NA
TULO    := 1        TDUR3D  := 50.000
ER      := ASV014

=>>SHO A 1
Automation 1

1: ASV001 := NOT IN201 # ECUACION AUXILIAR ESTADO INTERRUPTOR 1
2: ASV002 := NOT IN202 # ECUACION AUXILIAR ESTADO INTERRUPTOR 2
3: ASV003 := NOT IN203 # ECUACION AUXILIAR ESTADO INTERRUPTOR 3
4: ASV004 := NOT IN204 # ECUACION AUXILIAR ESTADO INTERRUPTOR 4
5: ASV005 := NOT IN205 # ECUACION AUXILIAR ESTADO INTERRUPTOR 5
6: ASV006 := NOT IN206 # ECUACION AUXILIAR ESTADO INTERRUPTOR 6
7: ASV007 := NOT IN207 # ECUACION AUXILIAR ESTADO INTERRUPTOR 7
8: ASV008 := NOT IN208 # ECUACION AUXILIAR ESTADO INTERRUPTOR 8
9: ASV009 := NOT IN107 # ECUACION AUXILIAR ESTADO INTERRUPTOR 9
10: ASV010 := NOT IN106 # ECUACION AUXILIAR ESTADO INTERRUPTOR 10
11: ASV011 := R_TRIG PSV06 AND ASV001 OR R_TRIG PSV05 AND ASV002 OR \
              R_TRIG PSV03 AND ASV003 OR R_TRIG PSV03 AND ASV005 # PARA \
              ER - ALIMENTADORES QUE OPERAN POR EDAC POR ESTADO DE \
              INTERRUPTOR
12: ASV012 := R_TRIG PSV01 OR R_TRIG PSV02 OR R_TRIG PSV04 OR \
              R_TRIG PSV23 OR R_TRIG PSV24 # PARA ER - \
              ESCALONES QUE NO GENERAN APERTURA Y ARRANQUE ER POR PSV 24 \
              - 25
13: ASV013 := ASV001 AND ASV002 AND ASV003 AND ASV005 # PARA ER - \
              ESTADOS DE LOS INT. QUE GENERAN APERTURA
14: ASV014 := ASV011 OR ASV012 AND ASV013 # PARA ER
15: ALT01S := PSV01
16: ALT01R := TRGTR
17: ALT02S := PSV02
18: ALT02R := TRGTR
19: ALT03S := PSV03
20: ALT03R := TRGTR
21: ALT04S := PSV04
```

INFORME (s) CDEC Nº: **IF N° 00039/2016**	FECHA DE FALLA: **07 de Enero de 2016**
INSTALACIÓN EDAC Baja Frecuencia SSSE Colchagua.	

```
22: ALT04R := TRGTR
23: ALT05S := PSV05
24: ALT05R := TRGTR
25: ALT06S := PSV06
26: ALT06R := TRGTR
27: ALT11S := OUT201
28: ALT11R := TRGTR
29: ALT12S := OUT202
30: ALT12R := TRGTR
31: ALT13S := OUT203
32: ALT13R := TRGTR
33: ALT14S := OUT204
34: ALT14R := TRGTR
35: ALT15S := OUT205
36: ALT15R := TRGTR
37: ALT16S := OUT206
38: ALT16R := TRGTR
39: ALT17S := OUT207
40: ALT17R := TRGTR
41: ALT18S := OUT208
42: ALT18R := TRGTR

=>>SHOD □□ D
DNP

DNP Object Default Map Enables

DNPBID  := Y        DNPBOD  := Y        DNPCOD  := Y        DNPAID  := Y
DNPAOD  := Y
=>>SHO F
Front Panel

Front Panel Settings

FP_TO   := 15
PB1_LED := NA
PB2_LED := NA
PB3_LED := NA
PB4_LED := NA
PB5_LED := NA
PB6_LED := NA
PB7_LED := NA
PB8_LED := NA
T1_LED  := ALT01
T1LEDL  := N
T1LEDA  := "EDAC1"
T2_LED  := ALT02
T2LEDL  := N
T2LEDA  := "EDAC2"
T3_LED  := ALT03
T3LEDL  := N
T3LEDA  := "EDAC3"
T4_LED  := ALT04
T4LEDL  := N
T4LEDA  := "EDAC4"
T5_LED  := ALT05
T5LEDL  := N
T5LEDA  := "EDAC5"
T6_LED  := ALT06
T6LEDL  := N
T6LEDA  := "EDAC6"
```

INFORME (s) CDEC Nº: **IF N° 00039/2016**	FECHA DE FALLA: **07 de Enero de 2016**
INSTALACIÓN EDAC Baja Frecuencia SSSE Colchagua.	

```
T7_LED  := NA
T7LEDL  := N
T7LEDA  := "ALIM9"
T8_LED  := NA
T8LEDL  := N
T8LEDA  := "ALIM10"
T9_LED  := ALT11
T9LEDL  := N
T9LEDA  := "ALIM1"
T10_LED := ALT12
T10LEDL := N
T10LEDA := "ALIM2"
T11_LED := ALT13
T11LEDL := N
T11LEDA := "ALIM3"
T12_LED := ALT14
T12LEDL := N
T12LEDA := "ALIM4"
T13_LED := ALT15
T13LEDL := N
T13LEDA := "ALIM5"
T14_LED := ALT16
T14LEDL := N
T14LEDA := "ALIM6"
T15_LED := ALT17
T15LEDL := N
T15LEDA := "ALIM7"
T16_LED := ALT18
T16LEDL := N
T16LEDA := "ALIM8"


Selectable Screens for the Front Panel

SCROLD  := 5        RMS_V   := Y        RMS_I   := Y        RMS_VPP := Y
RMS_W   := Y        FUNDVAR := Y        RMS_VA  := Y        RMS_PF  := Y
RMS_BK1 := Y        RMS_BK2 := Y        STA_BAT := Y        FUND_VI := Y
FUNDSEQ := Y        FUND_BK := Y

Selectable Operator Pushbuttons

PB1_HMI := OFF      PB2_HMI := OFF      PB3_HMI := OFF      PB4_HMI := OFF
PB5_HMI := OFF      PB6_HMI := OFF      PB7_HMI := OFF      PB8_HMI := OFF


Front Panel Event Display

DISP_ER := N

Display Points and Aliases
 (Boolean): Relay Word Bit Name, "Alias", "Set String", "Clear String"
 (Analog) : Analog Quantity Name, "User Text and Formatting"

1: FREQOK,"FRECUENCIA","OK","FAIL"
2: EAFSRC,"CAL. FREC","DESDE V_Z","DESDE V_Y"
3: ALTV,"MED. DE VOLT.","V_Z","V_Y"
4: TSOK,"RELOJ SAT.","OK","FAIL"
5: PSV18,"POTENCIALES VY","OK","FAIL"
6: PSV20,"POTENCIALES VZ","OK","FAIL"
7: ASV001,"52C1.MIRAFLO","CERRADO","ABIERTO"
8: ASV002,"52C2.TINGUIR","CERRADO","ABIERTO"
```

INFORME (s) CDEC Nº: **IF N° 00039/2016**	FECHA DE FALLA: **07 de Enero de 2016**
INSTALACIÓN EDAC Baja Frecuencia SSSE Colchagua.	

```
9: ASV003,"52C3.   ENAP","CERRADO","ABIERTO"
10: ASV004,"52C4.OHIGGIN","CERRADO","ABIERTO"
11: ASV005,"52C5.  MAGGI","CERRADO","ABIERTO"
12: ASV006,"52C6.ANTIVER","CERRADO","ABIERTO"


Local Control
(Local Bit, Local Name, Local Set State, Local Clear State, Pulse Enable)


=>>SHO G
Global

General Global Settings

SID     := "SE COLCHAGUA"
RID     := "RELE DE FRECUENCIA"
NUMBK   := 1
BID1    := "SE COLCHAGUA"
NFREQ   := 50       PHROT   := ABC      DATE_F  := DMY
FAULT   := NA


Global Enables

EDCMON  := 1        EICIS   := N        EDRSTC  := N        EGADVS  := Y
EPMU    := Y

Station DC1 Monitor

DC1LFP  := 100      DC1LWP  := 110      DC1HWP  := 140      DC1HFP  := 150
DC1RP   := 9        DC1GF   := 1.05

Control Inputs

GINP    := 85       GINDF   := 80       IN1XXD  := 0.1250   IN2XXD  := 0.1250


Settings Group Selection

SS1     := 1
SS2     := NA
SS3     := NA
SS4     := NA
SS5     := NA
SS6     := NA
TGR     := 0

Frequency Estimation

EAFSRC  := PSV27
VF01    := VAY      VF02    := VBY      VF03    := VCY      VF11    := VAZ
VF12    := VBZ      VF13    := VCZ

Time-Error Calculation

STALLTE := NA
LOADTE  := NA


Current and Voltage Source Selection
```

INFORME (s) CDEC Nº: **IF N° 00039/2016**	FECHA DE FALLA: **07 de Enero de 2016**
INSTALACIÓN EDAC Baja Frecuencia SSSE Colchagua.	

```
ESS     := Y        LINEI   := IW       ALINEI  := NA       BK1I    := IW
IPOL    := NA       ALINEV  := VZ
ALTV    := PSV27


Synchronized Phasor Measurement Settings

MFRMT   := C37.118  MRATE   := 2        PMAPP   := F        PHCOMP  := Y
PMSTN   := "SE COLCHAGUA"
PMID    := 1
PHDATAV := V1       VCOMP   := 0.00     PHDATAI := NA       IWCOMP  := 0.00
IXCOMP  := 0.00     PHNR    := I        PHFMT   := R        FNR     := I
NUMANA  := 0        NUMDSW  := 1
TREA1   := NA
TREA2   := NA
TREA3   := NA
TREA4   := NA
PMTRIG  := NA

=>>SHO L 1
Protection 1

1: PMV01 := -DFDT
2: PSV11 := 0.600000 < PMV01 AND FREQ < 49.000000 AND 10.000000 > PMV01
3: PCT01IN := PSV11 AND TSOK
4: PCT01PU := 2.000000
5: PCT01DO := 50.000000
6: PSV01 := PCT01Q #EDAC1
7: PSV12 := FREQ < 48.900002 AND 10.000000 > PMV01
8: PCT02IN := PSV12
9: PCT02PU := 2.000000
10: PCT02DO := 50.000000
11: PSV02 := PCT02Q #EDAC2
12: PSV13 := 0.600000 < PMV01 AND FREQ < 48.799999 AND 10.000000 > PMV01
13: PCT03IN := PSV13 AND TSOK
14: PCT03PU := 2.000000
15: PCT03DO := 50.000000
16: PSV03 := PCT03Q #EDAC3
17: PSV14 := FREQ < 48.700001 AND 10.000000 > PMV01
18: PCT04IN := PSV14
19: PCT04PU := 2.000000
20: PCT04DO := 50.000000
21: PSV04 := PCT04Q #EDAC4
22: PSV15 := FREQ < 48.500000 AND 10.000000 > PMV01
23: PCT05IN := PSV15
24: PCT05PU := 2.000000
25: PCT05DO := 50.000000
26: PSV05 := PCT05Q #EDAC5
27: PSV16 := FREQ < 48.299999 AND 10.000000 > PMV01
28: PCT06IN := PSV16
29: PCT06PU := 2.000000
30: PCT06DO := 50.000000
31: PSV06 := PCT06Q #EDAC6
32: PSV17 := VAYM < 20.000000 OR VBYM < 20.000000 OR VCYM < 20.000000 # VY \
             CON AL MENOS UN POTENCIAL MENOS
33: PSV18 := VAYM > 20.000000 AND VBYM > 20.000000 AND VCYM > 20.000000 # \
             VY CON AL MENOS UN PORTENCIAL OK
34: PSV19 := VAZM < 20.000000 OR VBZM < 20.000000 OR VCZM < 20.000000 # VZ \
             CON AL MENOS UN POTENCIAL MENOS
35: PSV20 := VAZM > 20.000000 AND VBZM > 20.000000 AND VCZM > 20.000000 # \
```

INFORME (s) CDEC Nº: **IF N° 00039/2016**	FECHA DE FALLA: **07 de Enero de 2016**
INSTALACIÓN EDAC Baja Frecuencia SSSE Colchagua.	

```
             VZ CON AL MENOS UN PORTENCIAL OK
36: PSV21 := PSV17 AND PSV20 #CONDICION ALARMA PERD POT PRINCIPAL
37: PSV22 := PSV19 AND PSV18 #CONDICION ALARMA PERD POT SECUNDARIO
38: PSV23 := 0.600000 >= PMV01 AND FREQ < 49.000000 #EVENTO FREQ <49.0
39: PSV24 := 0.600000 >= PMV01 AND FREQ < 48.799999 #EVENTO FREQ <48.8
40: PSV25 := VAYM > 20.000000 OR VBYM > 20.000000 OR VCYM > 20.000000 # \
             CON AL MENOS UN POTENCIAL VY OK
41: PSV26 := VAZM > 20.000000 OR VBZM > 20.000000 OR VCZM > 20.000000 # \
             CON AL MENOS UN POTENCIAL VZ OK
42: PCT07IN := PSV25 # INDICA VOLTAJE VY OK
43: PCT07PU := 30000.000000 # ESPERA QUE VOLTAJE VY ESTE OK POR 10 MIN
44: PCT07DO := 30000.000000 # AL MORIR VY ESPERA 10 MIN
45: PCT08IN := PSV26 # INDICA VOLTAJE VZ OK
46: PCT08PU := 30000.000000 # ESPERA QUE VOLTAJE VZ ESTE OK POR 10 MIN
47: PCT08DO := 30000.000000 # AL MORIR VZ ESPERA 10 MIN
48: PSV27 := NOT PCT07Q AND PCT08Q # SE HACE 1 DESPUES DE 10 SEG QUE MUERE \
             VY SIEMPRE QUE VZ ESTE VIVO
49: PSV28 := DMON <> 3.000000 AND DMON <> 4.000000 # NO OPERA EN MARZO Y \
             ABRIL
50: PSV29 := DMON <> 6.000000 AND DMON <> 7.000000 AND DMON <> 8.000000 # \
             NO OPERA ENTRE JUNIO Y AGOSTO
51: PSV30 := THR < 8.000000 # HBILITA OPERACION ENTRE LAS 00:00HR Y LAS \
             08:00HR

=>>SHO M
Breaker Monitor

Breaker Configuration

EB1MON  := N

Breaker 1 Inputs

52AA1   := NA

=>>SHO P□O
Output

Main Board

OUT101  := NA
OUT102  := NA
OUT103  := NA
OUT104  := NA
OUT105  := NA
OUT106  := PSV03 OR PSV05 OR PSV06 #ALARMA POR ALIMENTADOR EDAC OPERADO
OUT107  := PSV21 OR PSV22 #NORMAL ABIERTO - PARALELO A OUT108
OUT108  := NOT HALARM #NORMAL CERRADO - PARALELO A OUT107


Interface Board #1

OUT201  := PSV06
OUT202  := PSV05
OUT203  := PSV03
OUT204  := NA
OUT205  := PSV03
OUT206  := NA
OUT207  := NA
OUT208  := NA
OUT209  := NA
```

INFORME (s) CDEC Nº: **IF N° 00039/2016**	FECHA DE FALLA: **07 de Enero de 2016**
INSTALACIÓN EDAC Baja Frecuencia SSSE Colchagua.	

```
OUT210  := NA
OUT211  := NA
OUT212  := NA
OUT213  := NA
OUT214  := NA
OUT215  := NA


Mirrored Bits Transmit Equations

TMB1A   := NA
TMB2A   := NA
TMB3A   := NA
TMB4A   := NA
TMB5A   := NA
TMB6A   := NA
TMB7A   := NA
TMB8A   := NA
TMB1B   := NA
TMB2B   := NA
TMB3B   := NA
TMB4B   := NA
TMB5B   := NA
TMB6B   := NA
TMB7B   := NA
TMB8B   := NA

=>>SHO P 1
Port 1

Protocol Selection

PROTO   := SEL

Communications Settings

SPEED   := 9600     DATABIT := 8        PARITY  := N        STOPBIT := 1
RTSCTS  := N

SEL Protocol Settings

TIMEOUT := 5        AUTO    := N        FASTOP  := N        TERTIM1 := 5
TERSTRN := "\005"
TERTIM2 := 0
=>>SHO P 2
Port 2

Protocol Selection

PROTO   := SEL

Communications Settings

SPEED   := 9600     DATABIT := 8        PARITY  := N        STOPBIT := 1
RTSCTS  := N

SEL Protocol Settings

TIMEOUT := 5        AUTO    := Y        FASTOP  := N        TERTIM1 := 1
TERSTRN := "\005"
TERTIM2 := 0
```

INFORME (s) CDEC Nº: **IF N° 00039/2016**	FECHA DE FALLA: **07 de Enero de 2016**
INSTALACIÓN EDAC Baja Frecuencia SSSE Colchagua.	

```
=>>SHO P 3
Port 3

Protocol Selection

PROTO   := SEL

Communications Settings

SPEED   := 9600     DATABIT := 8        PARITY  := N        STOPBIT := 1
RTSCTS  := N

SEL Protocol Settings

TIMEOUT := 10       AUTO    := N        FASTOP  := N        TERTIM1 := 1
TERSTRN := "\005"
TERTIM2 := 0
=>>SHO P F
Port F

Protocol Selection

PROTO   := SEL

Communications Settings

SPEED   := 57600    DATABIT := 8        PARITY  := N        STOPBIT := 1
RTSCTS  := N

SEL Protocol Settings

TIMEOUT := 5        AUTO    := N        FASTOP  := N        TERTIM1 := 1
TERSTRN := "\005"
TERTIM2 := 0
=>>SHO R
Report

SER Chatter Criteria

ESERDEL := N

SER Points
(Relay Word Bit, Reporting Name, Set State Name, Clear State Name, HMI Alarm)

1: PSV01,"EDAC1T","Asserted","Deasserted",N
2: PSV02,"EDAC2T","Asserted","Deasserted",N
3: PSV03,"EDAC3T","Asserted","Deasserted",N
4: PSV04,"EDAC4T","Asserted","Deasserted",N
5: PSV05,"EDAC5T","Asserted","Deasserted",N
6: PSV06,"EDAC6T","Asserted","Deasserted",N
7: PSV11,"EDAC1","Asserted","Deasserted",N
8: PSV12,"EDAC2","Asserted","Deasserted",N
9: PSV13,"EDAC3","Asserted","Deasserted",N
10: PSV14,"EDAC4","Asserted","Deasserted",N
11: PSV15,"EDAC5","Asserted","Deasserted",N
12: PSV16,"EDAC6","Asserted","Deasserted",N
13: PSV17,"VY-A+B+C<20V","Asserted","Deasserted",N
14: PSV18,"VY-A*B*C>20V","Asserted","Deasserted",N
15: PSV19,"VZ-A+B+C<20V","Asserted","Deasserted",N
16: PSV20,"VZ-A*B*C>20V","Asserted","Deasserted",N
17: PSV21,"ALRM.SIN.V.PRSPAL.","Asserted","Deasserted",N
```

INFORME (s) CDEC Nº: **IF N° 00039/2016**	FECHA DE FALLA: **07 de Enero de 2016**
INSTALACIÓN EDAC Baja Frecuencia SSSE Colchagua.	

```
18: PSV22,"ALRM.SIN.V.SECDRIO.","Asserted","Deasserted",N
19: PSV23,"FREQ<49.0_DFDT=<0.6","Asserted","Deasserted",N
20: PSV24,"FREQ<48.8_DFDT=<0.6","Asserted","Deasserted",N
21: PSV25,"VY-A+B+C>20V","Asserted","Deasserted",N
22: PSV26,"VZ-A+B+C>20V","Asserted","Deasserted",N
23: PSV27,"CAMBIO_DE_POT","Asserted","Deasserted",N
24: PSV28,"NP-MZ-AB","Asserted","Deasserted",N
25: PSV29,"NP-JUN-AG","Asserted","Deasserted",N
26: PSV30,"OP-00-08HR","Asserted","Deasserted",N
27: IN101,"IN101","Asserted","Deasserted",N
28: IN102,"IN102","Asserted","Deasserted",N
29: IN103,"IN103","Asserted","Deasserted",N
30: IN104,"IN104","Asserted","Deasserted",N
31: IN105,"IN105","Asserted","Deasserted",N
32: IN106,"IN106","Asserted","Deasserted",N
33: IN107,"IN107","Asserted","Deasserted",N
34: IN201,"IN201","Asserted","Deasserted",N
35: IN202,"IN202","Asserted","Deasserted",N
36: IN203,"IN203","Asserted","Deasserted",N
37: IN204,"IN204","Asserted","Deasserted",N
38: IN205,"IN205","Asserted","Deasserted",N
39: IN206,"IN206","Asserted","Deasserted",N
40: IN207,"IN207","Asserted","Deasserted",N
41: IN208,"IN208","Asserted","Deasserted",N
42: OUT101,"OUT101","Asserted","Deasserted",N
43: OUT102,"OUT102","Asserted","Deasserted",N
44: OUT103,"OUT103","Asserted","Deasserted",N
45: OUT104,"OUT104","Asserted","Deasserted",N
46: OUT105,"OUT105","Asserted","Deasserted",N
47: OUT106,"OUT106","Asserted","Deasserted",N
48: OUT107,"OUT107","Asserted","Deasserted",N
49: OUT108,"OUT108","Asserted","Deasserted",N
50: OUT201,"OUT201","Asserted","Deasserted",N
51: OUT202,"OUT202","Asserted","Deasserted",N
52: OUT203,"OUT203","Asserted","Deasserted",N
53: OUT204,"OUT204","Asserted","Deasserted",N
54: OUT205,"OUT205","Asserted","Deasserted",N
55: OUT206,"OUT206","Asserted","Deasserted",N
56: OUT207,"OUT207","Asserted","Deasserted",N
57: OUT208,"OUT208","Asserted","Deasserted",N
58: OUT209,"OUT209","Asserted","Deasserted",N
59: OUT210,"OUT210","Asserted","Deasserted",N
60: OUT211,"OUT211","Asserted","Deasserted",N
61: OUT212,"OUT212","Asserted","Deasserted",N
62: OUT213,"OUT213","Asserted","Deasserted",N
63: OUT214,"OUT214","Asserted","Deasserted",N
64: OUT215,"OUT215","Asserted","Deasserted",N
65: ALTV,"ALTV","Asserted","Deasserted",N
66: FREQOK,"FREQOK","Asserted","Deasserted",N
67: EAFSRC,"EAFSRC","Asserted","Deasserted",N
68: ER,"ER","Asserted","Deasserted",N
69: TSOK,"SEL2407_OK","Asserted","Deasserted",N
70: PCT07Q,"PCT07Q","Asserted","Deasserted",N
71: PCT08Q,"PCT08Q","Asserted","Deasserted",N
72: ASV001,"52C1.MIRAFLORES","Asserted","DEASSERTED",N
73: ASV002,"52C2.TINGUIRIRICA","Asserted","Deasserted",N
74: ASV003,"52C3.ENAP","Asserted","Deasserted",N
75: ASV004,"52C4.OHIGGINS","Asserted","Deasserted",N
76: ASV005,"52C5.MAGGI","Asserted","Deasserted",N
77: ASV006,"52C6.ANTIVERO","Asserted","DEASSERTED",N
78: ASV007,"52C7.","Asserted","Deasserted",N
```

INFORME (s) CDEC Nº: **IF N° 00039/2016**	FECHA DE FALLA: **07 de Enero de 2016**
INSTALACIÓN EDAC Baja Frecuencia SSSE Colchagua.	

```
79: ASV008,"52C8.","Asserted","Deasserted",N
80: ASV009,"ESTADO_ALM_9","Asserted","Deasserted",N
81: ASV010,"ESTADO_ALM_10","Asserted","Deasserted",N
82: ASV011,"ASV011","Asserted","Deasserted",N
83: ASV012,"ASV012","Asserted","Deasserted",N
84: ASV013,"ASV013","Asserted","Deasserted",N
85: ASV014,"ASV014","Asserted","Deasserted",N


EVENT REPORTING

SRATE   := 1        LER     := 1.20     PRE     := 0.40

Event Reporting Digital Elements
(800 Relay Word Bits Maximum from 100 Rows Maximum)

1: IN107
2: IN106
3: IN105
4: IN104
5: IN103
6: IN102
7: IN101
8: IN208
9: IN207
10: IN206
11: IN205
12: IN204
13: IN203
14: IN202
15: IN201
16: OUT108
17: OUT107
18: OUT106
19: OUT105
20: OUT104
21: OUT103
22: OUT102
23: OUT101
24: OUT208
25: OUT207
26: OUT206
27: OUT205
28: OUT204
29: OUT203
30: OUT202
31: OUT201
32: OUT215
33: OUT214
34: OUT213
35: OUT212
36: OUT211
37: OUT210
38: OUT209
39: PSV08
40: PSV07
41: PSV06
42: PSV05
43: PSV04
44: PSV03
45: PSV02
```

INFORME (s) CDEC Nº: **IF N° 00039/2016**	FECHA DE FALLA: **07 de Enero de 2016**
INSTALACIÓN EDAC Baja Frecuencia SSSE Colchagua.	

46: PSV01
47: PSV16
48: PSV15
49: PSV14
50: PSV13
51: PSV12
52: PSV11
53: PSV10
54: PSV09
55: PSV24
56: PSV23
57: PSV22
58: PSV21
59: PSV20
60: PSV19
61: PSV18
62: PSV17
63: PSV32
64: PSV31
65: PSV30
66: PSV29
67: PSV28
68: PSV27
69: PSV26
70: PSV25
71: PSV40
72: PSV39
73: PSV38
74: PSV37
75: PSV36
76: PSV35
77: PSV34
78: PSV33
79: PSV48
80: PSV47
81: PSV46
82: PSV45
83: PSV44
84: PSV43
85: PSV42
86: PSV41
87: PSV56
88: PSV55
89: PSV54
90: PSV53
91: PSV52
92: PSV51
93: PSV50
94: PSV49
95: PSV64
96: PSV63
97: PSV62
98: PSV61
99: PSV60
100: PSV59
101: PSV58
102: PSV57
103: ASV008
104: ASV007
105: ASV006
106: ASV005

INFORME (s) CDEC Nº: **IF N° 00039/2016**	FECHA DE FALLA: **07 de Enero de 2016**
INSTALACIÓN EDAC Baja Frecuencia SSSE Colchagua.	

```
107: ASV004
108: ASV003
109: ASV002
110: ASV001
111: ASV016
112: ASV015
113: ASV014
114: ASV013
115: ASV012
116: ASV011
117: ASV010
118: ASV009
119: ASV024
120: ASV023
121: ASV022
122: ASV021
123: ASV020
124: ASV019
125: ASV018
126: ASV017
127: ASV032
128: ASV031
129: ASV030
130: ASV029
131: ASV028
132: ASV027
133: ASV026
134: ASV025
135: ASV040
136: PCT08Q
137: PCT07Q
138: ALTI
139: ALTV
140: ALTS2
141: DELAY
142: TIRIG
143: TUPDH
144: TSYNCA
145: TSOK
146: PMDOK
147: FREQOK
148: SALARM
149: HALARM
150: BADPASS
151: CCALARM

=>>
```

PLANTA: Teno
PROPIETARIO: Paneles Arauco S.A.
TÍTULO DE LA FALLA: Operación de EDAC en Planta Teno del día 07/01/2016
CODIGO DE FALLA: 2011
FENÓMENO FÍSICO: No aplica[1]
ELEMENTO: No aplica[2]
FENÓMENO ELÉCTRICO: No aplica[3]
MODO: No aplica[4]
COMUNA: 13402
FECHA Y HORA DE INICIO: 07 de Enero del 2016 a las 01:13 hrs.
CÓDIGO INFORME DE FALLA: IF00037/2016

1. DESCRIPCIÓN DE LA FALLA

Con fecha 07 de Enero del 2016 y a las 01:13 hrs. se produce una interrupción forzada por protecciones en las líneas 154kV Tinguiririca – Rancagua – Alto Jahuel. Lo anterior, origina una baja de frecuencia que conduce a la activación del escalón 1 del sistema EDAC de Planta Teno. Se deslastró aproximadamente 1,3 MW.
A las 01:21 hrs. se normalizan los consumos de planta Teno.

2. INSTALACIONES AFECTADAS

Apertura de los interruptores:

52CB4, 52CB5, 52CB6, 52CB7, 52CB8, 52CB9, 52CB10, 52CB11, 52CB12.

[1] No aplica porque el fenómeno físico se produce en instalaciones de terceros.
[2] No aplica porque elemento eléctrico pertenece a instalaciones de terceros.
[3] No aplica porque el fenómeno eléctrico se produce en instalaciones de terceros.
[4] No aplica porque el interruptor que debe despejar la falla pertenece a instalaciones de terceros.

2.1 DIAGRAMA UNILINEAL DE LAS INSTALACIONES AFECTADAS

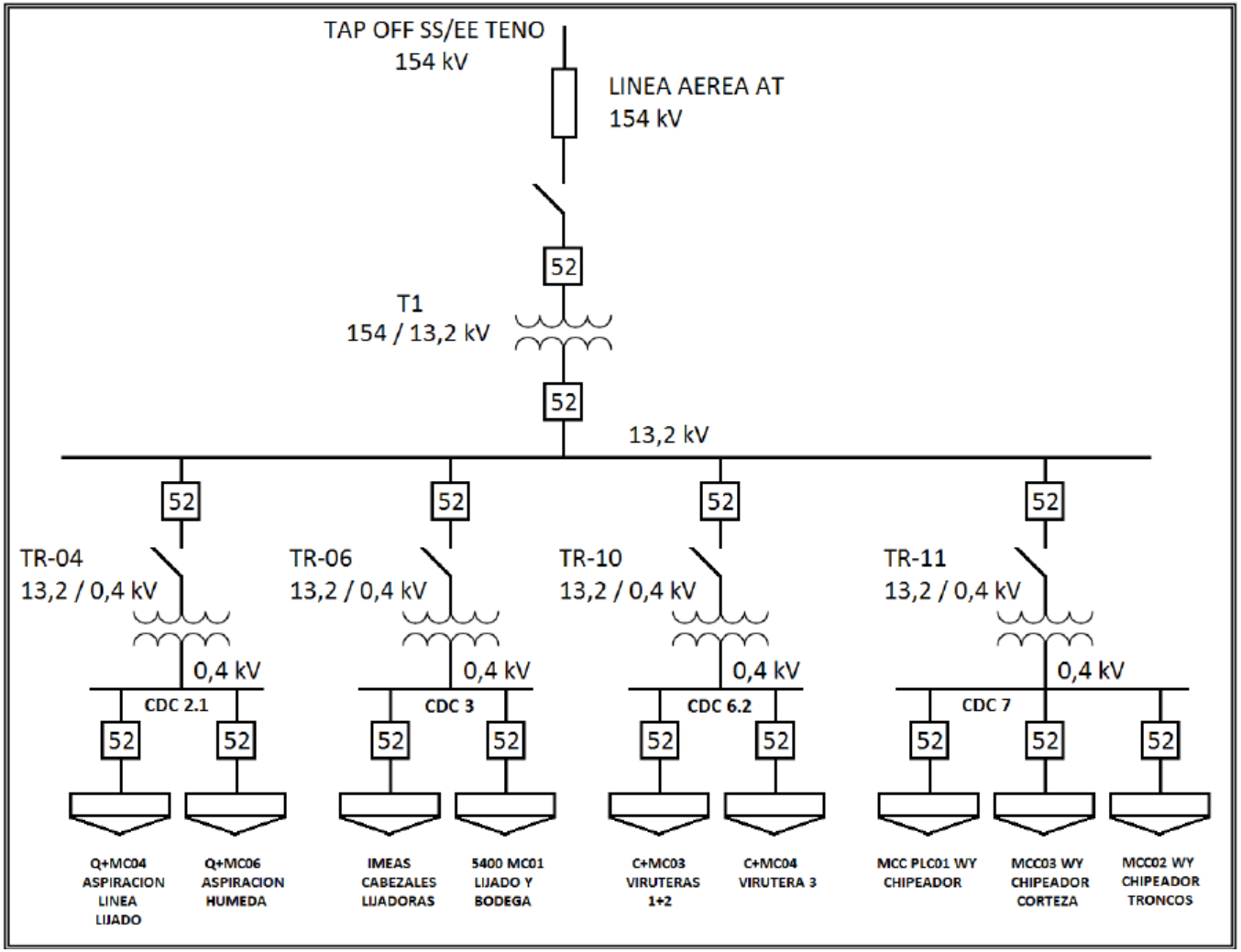


Figura 2.1: Esquema unilineal de esquema EDAC Planta Teno.

3. PÉRDIDAS DE CONSUMO

3.1. Consumo Planta Teno: 5,2 MW

3.2. Deslastre: 1,3 MW

4. REPETICIONES

4.1. Falla en instalaciones de terceros por lo que se desconoce información. Arauco no cuenta con registros de falla de instalaciones de terceros, solo propios.

5. CRONOLOGÍA Y DESCRIPCIÓN DE LAS CAUSAS DEL EVENTO

5.1. A las 01:13 hrs. se produce una interrupción forzada por protecciones en las líneas 154kV Tinguiririca – Rancagua – Alto Jahuel. Debido a lo anterior se producen los eventos que siguen.

5.2. A las 01:13:10,684146 hrs. se produce la activación del escalón 1 del sistema EDAC de Planta Teno.

5.3. A las 01:21 hrs. se normalizan los consumos de Planta Teno.

6. REGISTRO DE EVENTOS

6.1. PROTECCION F60 EDAC

Event Number	Date/Time	
1625407	Jan 07 2016 01:13:10.720339	C+MC04 ABTO On
1625406	Jan 07 2016 01:13:10.718836	5400MC01 ABT On
1625405	Jan 07 2016 01:13:10.718337	MCC03 WY CER Off
1625404	Jan 07 2016 01:13:10.717836	IMEAS CERRAD On
1625403	Jan 07 2016 01:13:10.717836	IMEAS ABTO On
1625402	Jan 07 2016 01:13:10.717836	5400MC01 CER On
1625401	Jan 07 2016 01:13:10.717335	Q+MC04 ABTO On
1625400	Jan 07 2016 01:13:10.713334	5400MC01 CER Off
1625399	Jan 07 2016 01:13:10.711334	IMEAS CERRAD Off
1625398	Jan 07 2016 01:13:10.684146	EDAC OPERADO On
1625397	Jan 07 2016 01:13:10.684146	TR MCC03 WY On
1625396	Jan 07 2016 01:13:10.684146	TR MCC02 WY On
1625395	Jan 07 2016 01:13:10.684146	TR MMCCPLC01 On
1625394	Jan 07 2016 01:13:10.684146	TR C+MC03 On
1625393	Jan 07 2016 01:13:10.684146	TR C+MC04 On
1625392	Jan 07 2016 01:13:10.684146	TR IMEAS On
1625391	Jan 07 2016 01:13:10.684146	TR 5400MC01 On
1625390	Jan 07 2016 01:13:10.684146	TR Q+MC04 On
1625389	Jan 07 2016 01:13:10.684146	TR Q+MC06 On
1625388	Jan 07 2016 01:13:10.684146	EDAC OPERADO On
1625387	Jan 07 2016 01:13:10.684146	ESC 1 OPERAD On
1625386	Jan 07 2016 01:13:10.684146	UNDERFREQ 1 OP
1625385	Jan 07 2016 01:13:10.684146	UNDERFREQ 1 PKP
1625384	Jan 07 2016 01:13:09.728799	FREQ RATE 1 OP
1625383	Jan 07 2016 01:13:09.728799	FREQ RATE 1 PKP
1625382	Jan 07 2016 01:07:26.724592	FREQ RATE 1 DPO
1625381	Jan 07 2016 01:07:26.649735	FREQ RATE 1 PKP
1625380	Jan 07 2016 01:07:26.345305	FREQ RATE 1 DPO
1625379	Jan 07 2016 01:07:26.252853	FREQ RATE 1 OP
1625378	Jan 07 2016 01:07:26.252853	FREQ RATE 1 PKP
1625377	Dec 29 2015 11:46:09.999443	FREQ RATE 1 DPO
1625376	Dec 29 2015 11:46:09.964429	FREQ RATE 1 OP
1625375	Dec 29 2015 11:46:09.964429	FREQ RATE 1 PKP
1625374	Dec 18 2015 08:00:48.507876	FREQ RATE 1 DPO
1625373	Dec 18 2015 08:00:48.475395	FREQ RATE 1 OP
1625372	Dec 18 2015 08:00:48.475395	FREQ RATE 1 PKP
1625371	Dec 18 2015 08:00:43.919715	FREQ RATE 1 DPO
1625370	Dec 18 2015 08:00:43.884800	FREQ RATE 1 PKP
1625369	Dec 18 2015 08:00:43.677895	FREQ RATE 1 DPO
1625368	Dec 18 2015 08:00:43.645430	FREQ RATE 1 OP
1625367	Dec 18 2015 08:00:43.645430	FREQ RATE 1 PKP
1625366	Dec 07 2015 11:25:43.153372	FREQ RATE 1 DPO
1625365	Dec 07 2015 11:25:43.098262	FREQ RATE 1 OP

Figura 6.1: Registro de eventos de protección F60 EDAC, planta Teno.

7. MEDIDAS SISTEMA SCADA ARAUCO BIOENERGÍA

7.1. POTENCIA ACTIVA Y REACTIVA EN PAÑO 52A1

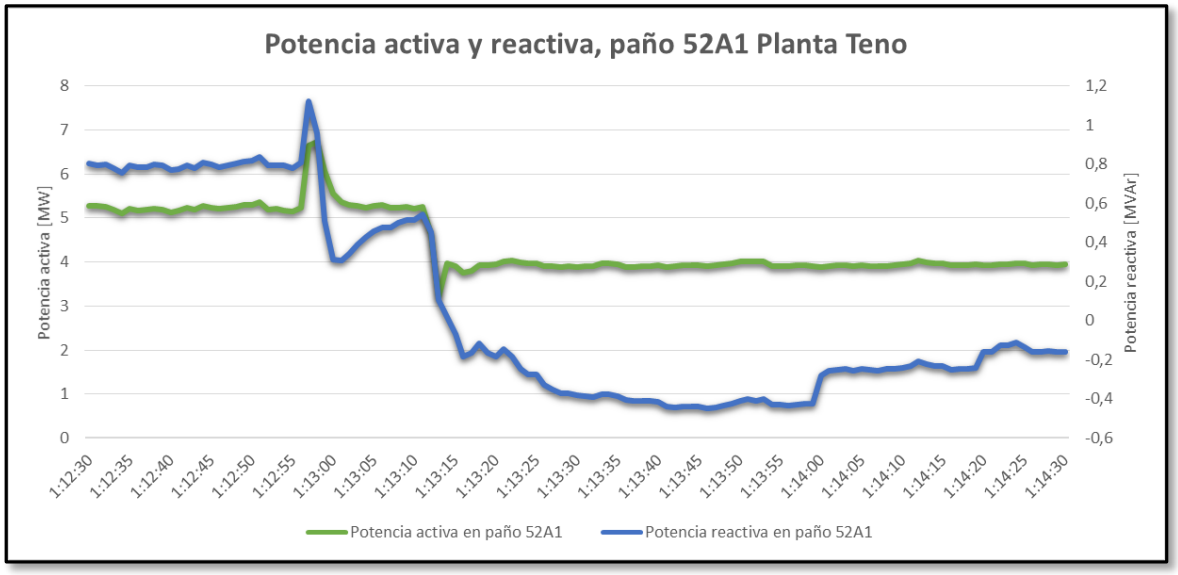


Figura 7.1: Potencia activa y reactiva en paño 52A1.

7.2. TENSIÓN Y FRECUENCIA EN PAÑO 52A1

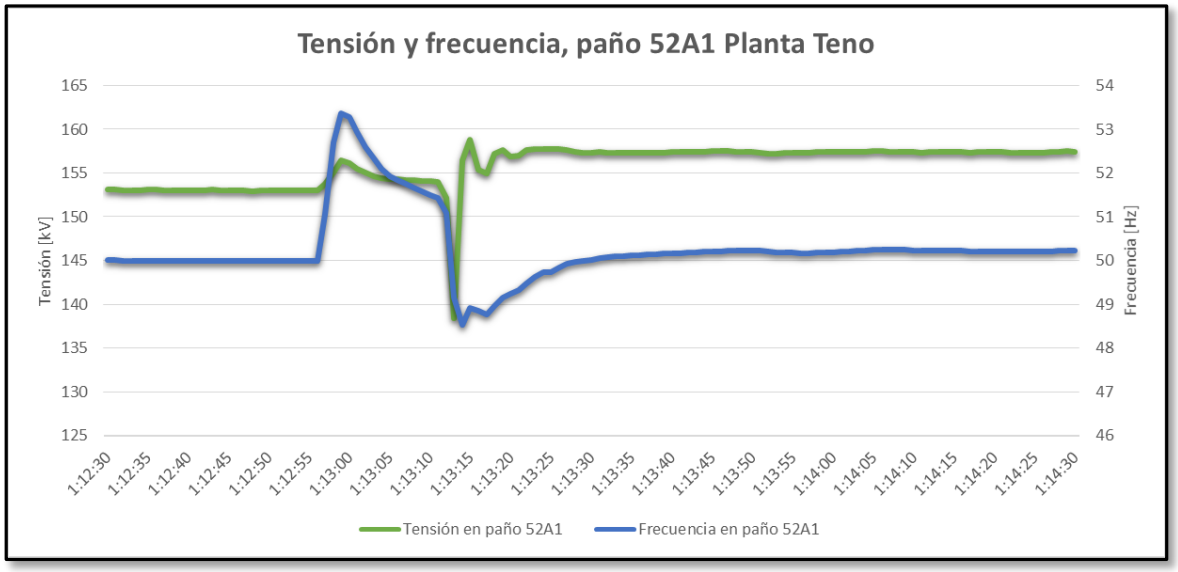


Figura 7.2: Tensión y frecuencia en paño 52A1.

8. ANÁLISIS DE LA ACTUACIÓN DEL SISTEMA EDAC

El sistema EDAC de Planta Teno, opera en base a los siguientes ajustes:

Escalón	Frecuencia	df/dt	Porcentaje Deslastre
1	49,0	< -0,6	100%[5]
4	48,7	---	100%

Tabla 8.1: Ajustes de sistema EDAC de Planta Teno.

En la figura 7.1 se observa que Planta Teno consumía alrededor de 5,2 MW de los cuales 1,3 MW fueron deslastrados por la operación del EDAC BF.

Deslastre (MW)	Deslastre Acumulado Real
1,3	25 %

Tabla 8.2: Deslastre sistema EDAC Planta Viñales

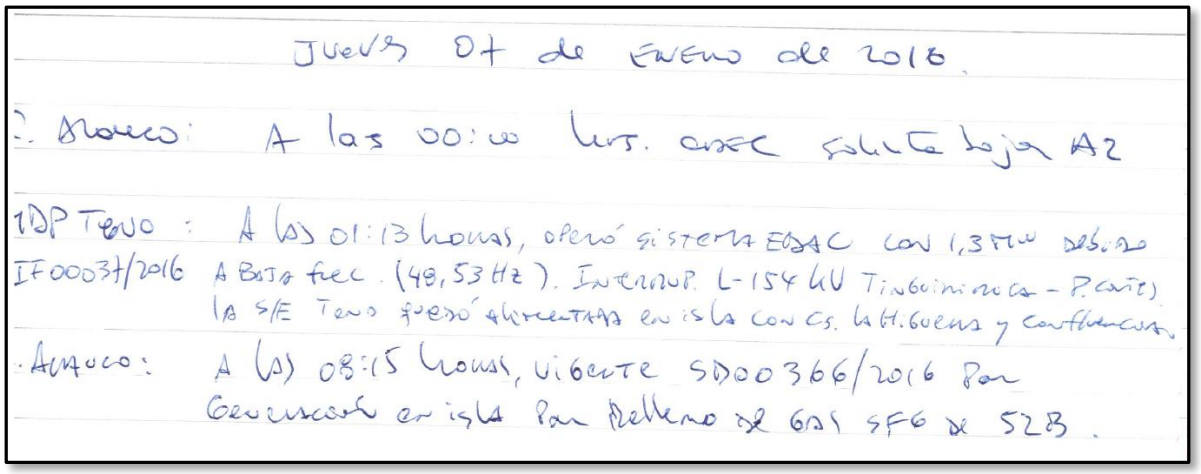
9. ACCIONES CORRECTIVAS

9.1. Acciones Correctivas LP: No se necesitan ya que se concluye una correcta operación del esquema EDAC BF.

9.2. Acciones Correctivas CP. No se necesitan ya que se concluye una correcta operación del esquema EDAC BF.

[5] Planta Teno posee 2 escalones que deslastran el 100% de la carga asociada al EDAC.

10. BITÁCORA DEL CENTRO DE CONTROL DE ARAUCO BIOENERGÍA S.A.



Jueves 07 de Enero de 2016.

C. Arauco: A las 00:00 hrs. CDEC solicita bajar A2

IDP Teno: A las 01:13 horas, operó sistema EDAC con 1,3 MW debido
IF00037/2016 a baja frec. (48,53 Hz). Interrup. L-154 kV Tinguiririca - P. Cortes
la S/E Teno quedó alimentada en isla con Cs. la Higuera y confluencia.

Arauco: A las 08:15 horas, vigente SD00366/2016 por
Generación en isla por relleno de gas SF6 de 52B.

11. INFORMES DE FALLA DE 48 HRS.

CDEC-SIC

Centro de Despacho Económico de Carga
Sistema Interconectado Central

Arauco Generación S.A.

INFORME DE FALLA | BUSQUEDA

Ud. Esta en : Desconectar > Subestación > Linea/Transformador/Otro Elemento > Otro Elemento

Número :	IF00037/2016	Fecha :	07/01/2016
Empresa :	Arauco Generación S.A.	Hora :	09:10

Instalación o Equipo Afectado:	Subestación : MDP_TENO_ARAUCO____154 Otro Elemento de Subestacion : SISTEMA EDAC ESQUEMA EDAC - BF
Perturbación :	Fecha : 07/01/2016 ;Hora Inicio: 01:13 Empresa instalación afectada:Arauco Bioenergía
Zona Afectada :	Sexta region /
Comuna Origen de Falla	Buin [13402]
Consumo Afectado :	Planta MDP Teno 154 kV / Perd. Estm. de Potencia: 1.3 MW / Region : SEPTIMA
Origen de la Falla :	Causa en otra Instalación del SIC

Causa :

DEFINITIVA

Código	Descripción
1010	Baja frecuencia

Fecha y Hora	Detalle	Reporta
07/01/2016 09:03	Interrupción de las líneas de 154 kV Tiguiririca-Rancagua-A.Jahuel.	Erick Iturra H.

FENÓMENO FÍSICO

Código	Detalle
VAN3	Robo conductor o equipo

ELEMENTO

Código	Detalle
TX1	Cables Aislados o de Poder Linea

FENÓMENO ELÉCTRICO

Código	Detalle
FR81	Frecuencia

MODO

Código	Detalle
13	Opera según lo esperado

Informes con causa reiterada :

Observaciones:

Fecha y Hora	Comentarios	Reporta
07/01/2016 09:03	Planta MDP Teno pierde 1,3 MW de consumo debido a baja frecuencia (48,53 Hz). Operó escalón 4.	Erick Iturra H.

Acciones Inmediatas:	
Acciones a Corto Plazo :	No aplica.
Acciones a Largo Plazo :	No aplica.

Hechos Sucedidos:

Fecha y Hora	Hechos Sucedidos	Reporta
07/01/2016 09:03	Planta MDP Teno pierde 1,3 MW de consumo debido a baja frecuencia (48,53 Hz). Se encontraba con 5,3 MW de consumo.	Erick Iturra H.

Interruptores Operados, Actuación de Protecciones y Maniobras de Reposición :

Subestación	MDP_TENO_ARAUCO____154
Fecha	07/01/2016
Hora	01:13
Protección o Alarma Operada	Baja Frecuencia
Interruptor	Escalón 4
Fecha Normaliza	07/01/2016
Hora Normaliza	01:21
Consumo (MW)	1.30
Comentario	Baja Frecuencia (48,53 Hz)

Retorno :

Estimado	
Fecha	Hora
07/01/2016	01:21

Efectivo (1a servicio o disponibilidad completa)		
Equipo afectado	Fecha	Hora
ESQUEMA EDAC - BF	07/01/2015	01:21

Reporta Falla: Erick Iturra H.

COOPERATIVA ELÉCTRICA CURICÓ LTDA

INFORME DE FALLA
OPERACIÓN EDAC

07 DE ENERO DE 2016

OFICINAS Y BODEGAS CAMILO HENRIQUEZ 153 CASILLA 20-D CURICO
Fono: (75) 2310532 - Fax: (75) 2310389 E- Mail cec@cecltda.cl

Evento: Operación de EDAC.
Ubicación: SS/EE Curicó, Curicó, VII Región
Fecha – Hora inicio: 07 de Enero de 2016 01:11 hrs.
Fecha – Hora término: 07 de Enero de 2016 02:18 hrs**.**

ANTECEDENTES GENERALES

· **Listado de eventos generados y registrados en SCADA:**
Se muestra en anexo N° 1.

· **Registros de eventos y oscilografías:**

El registro de eventos se obtuvo del equipo GE de S/E Curicó. Las operaciones de los alimentadores quedaron registradas en el Scada.

CONSUMOS AFECTADOS

· **S/E Curicó: 6,600 MW (CEC)**

· **Identificación de la instalación con EDAC operada**

S/E Curicó Alimentador 52C6 La Obra Zapallar Bloque Nº 2
S/E Curicó Alimentador 52C7 Los Niches Bloque Nº 4

CONSUMO TOTAL PREVIO A LA OPERACIÓN DEL EDAC

S/E Curicó 7,301 MW
Total 7,301 MW

MONTO DE CARGA DISPONIBLE DE CEC EN CADA ESCALÓN ANTES DE LA OPERACIÓN DEL EDAC

Bloque N°1:

S/E Curicó Alimentador 52C6 La Obra Zapallar 1,54MW
Total: 1,54 MW

Bloque N°2:

S/E Curicó Alimentador 52C6 La Obra Zapallar 0,44MW
Total: 0,44 MW

Bloque N°3:

S/E Curicó Alimentador 52C7 Los Niches 2,00 MW
Total: 2,00 MW

Bloque N°4:

S/E Curicó Alimentador 52C7 Los Niches 0,44MW
Total: 0,44 MW

Bloque N°5:

S/E Curicó Alimentador 52C7 Los Niches 0,44 MW
Total: 0,44 MW

Bloque N°6:

S/E Curicó Alimentador 52C7 Los Niches 0,44 MW
Total: 0,44 MW

MONTO DE CARGA DESCONECTADA POR CEC POR OPERACIÓN DE EDAC EN CADA ESCALÓN

Bloque N°1: 0,0000 MW

Bloque N°2: 4,6000 MW

Bloque N°3: 0,0000 MW

Bloque N°4: 2,0000 MW

Bloque N°5: 0,0000 MW

Bloque N°6: 0,0000 MW

HORA EN QUE LA FRECUENCIA ALCANZA EL AJUSTE DE OPERACIÓN EN CADA ESCALÓN

Bloque N°1: ---

Bloque N°2: 01:10:57,444864 hrs.

Bloque N°3: ---

Bloque N°4: 01:10:57,607821 hrs.

Bloque N°5: ---

Bloque N°6: ---

HORA EN QUE SE DESCONECTA LA CARGA EN CADA ESCALÓN

Bloque N°1: ---

Bloque N°2: 01:10:57,592518 hrs.

Bloque N°3: ---

Bloque N°4: 01:10:57,756143 hrs.

Bloque N°5: ---

Bloque N°6: ---

CONCLUSIONES: En los eventos presentados del equipo GE de S/E Curicó se muestra claramente que la operación de las 01:11 hrs fue correcta de acuerdo a la programación. Se considera como correcta la operación del escalón N° 2 y del escalón Nº 4.

El alimentador 52C6 La Obra Zapallar operó en el escalón Nº 2 y la carga desprendida es la comprometida para los escalones Nº 1 y Nº 2

El alimentador 52C7 Los Niches operó en el escalón Nº 4 y la carga desprendida es la comprometida para los escalones Nº 3 y Nº 4

HORA EN EL QUE EL CC DIO AVISO CORRESPONDIENTE PARA LA NORMALIZACION DE LOS CONSUMOS

El centro de control del CDEC-SIC autorizó el 07/01/2016 a las 02:18 hrs a STS Osorno empresa encargada de maneja el SCADA de CEC a normalizar los consumos.

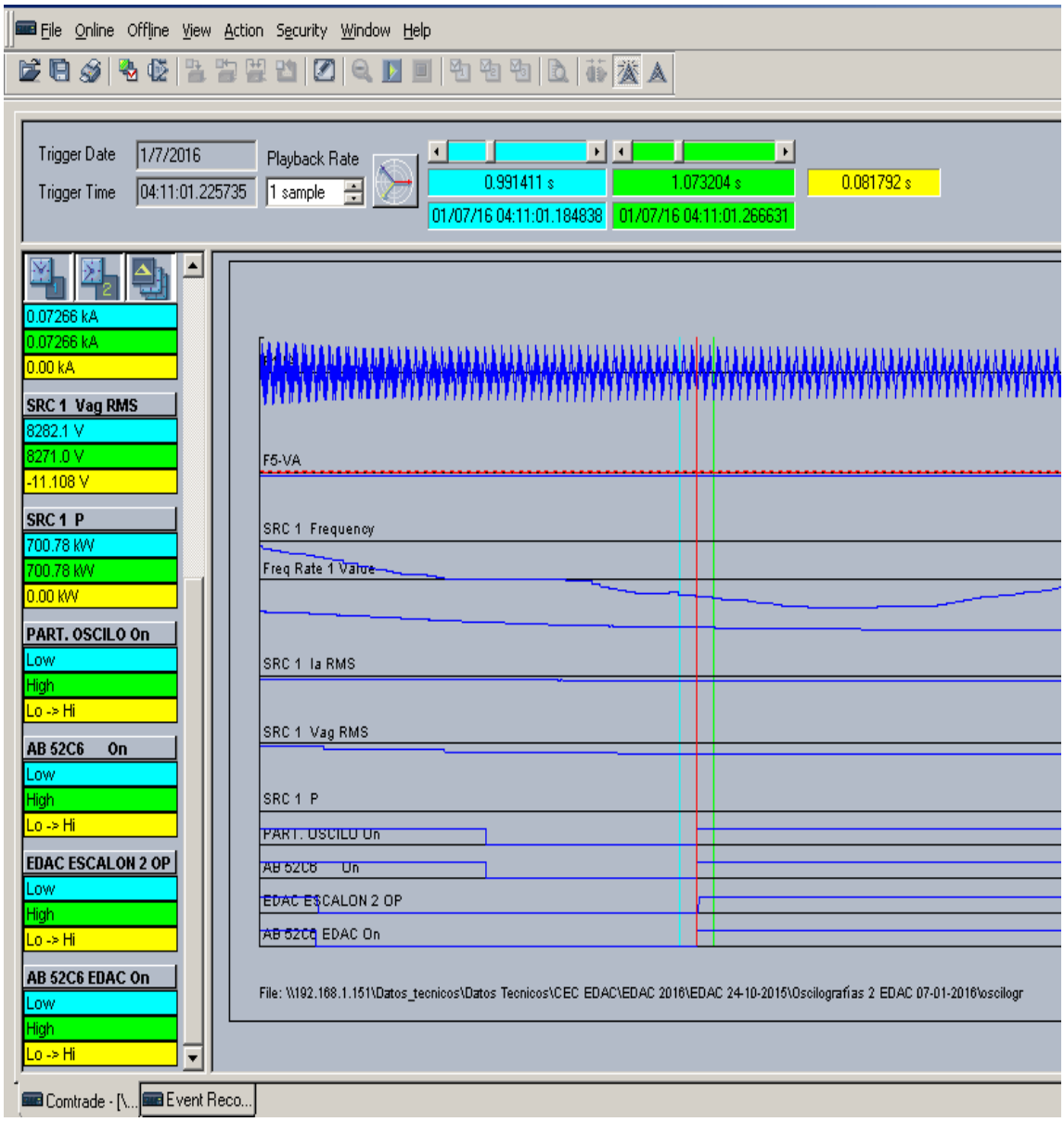
HORA EFECTIVA DE NORMALIZACIÓN DE LOS CONSUMOS

S/E Curicó Alimentador 52C6 La Obra Zapallar, operado Bloque Nº 2 normalizado el 07/01/2016 a las 02:18:27 Hrs.

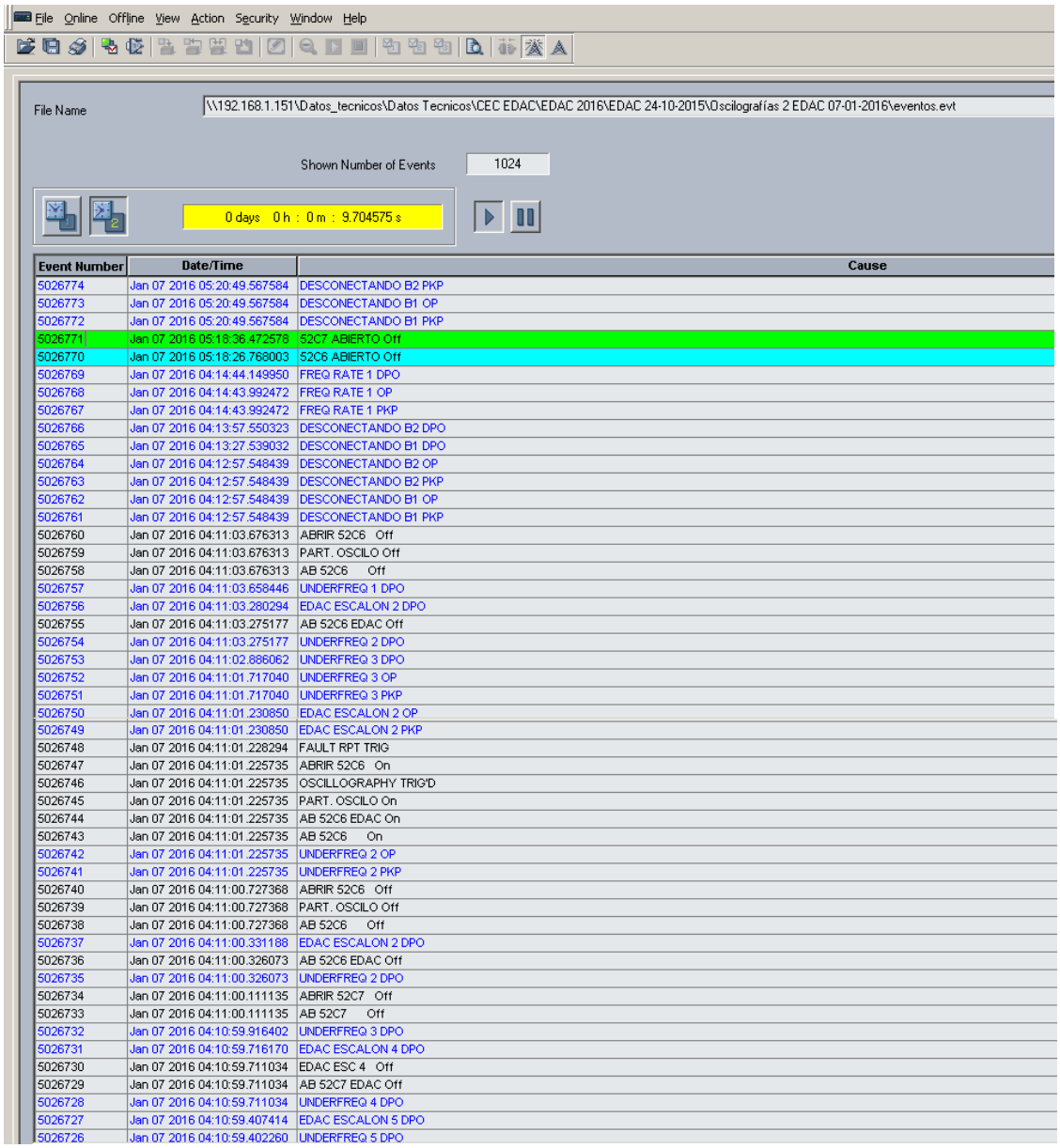
S/E Curicó Alimentador 52C7 Los Niches, operado Bloque Nº 4 normalizado el 07/01/2016 a las 02:18:36 Hrs.

Lo anterior se detalla en tabla **EVENTOS PROTECCIÓN GE S/E CURICÓ** adjunta

OSCILOGRAFIA DISPARO EDAC ALIMENTADOR 52-C6 Y 52-C7



EVENTOS PROTECCIÓN GE S/E CURICÓ



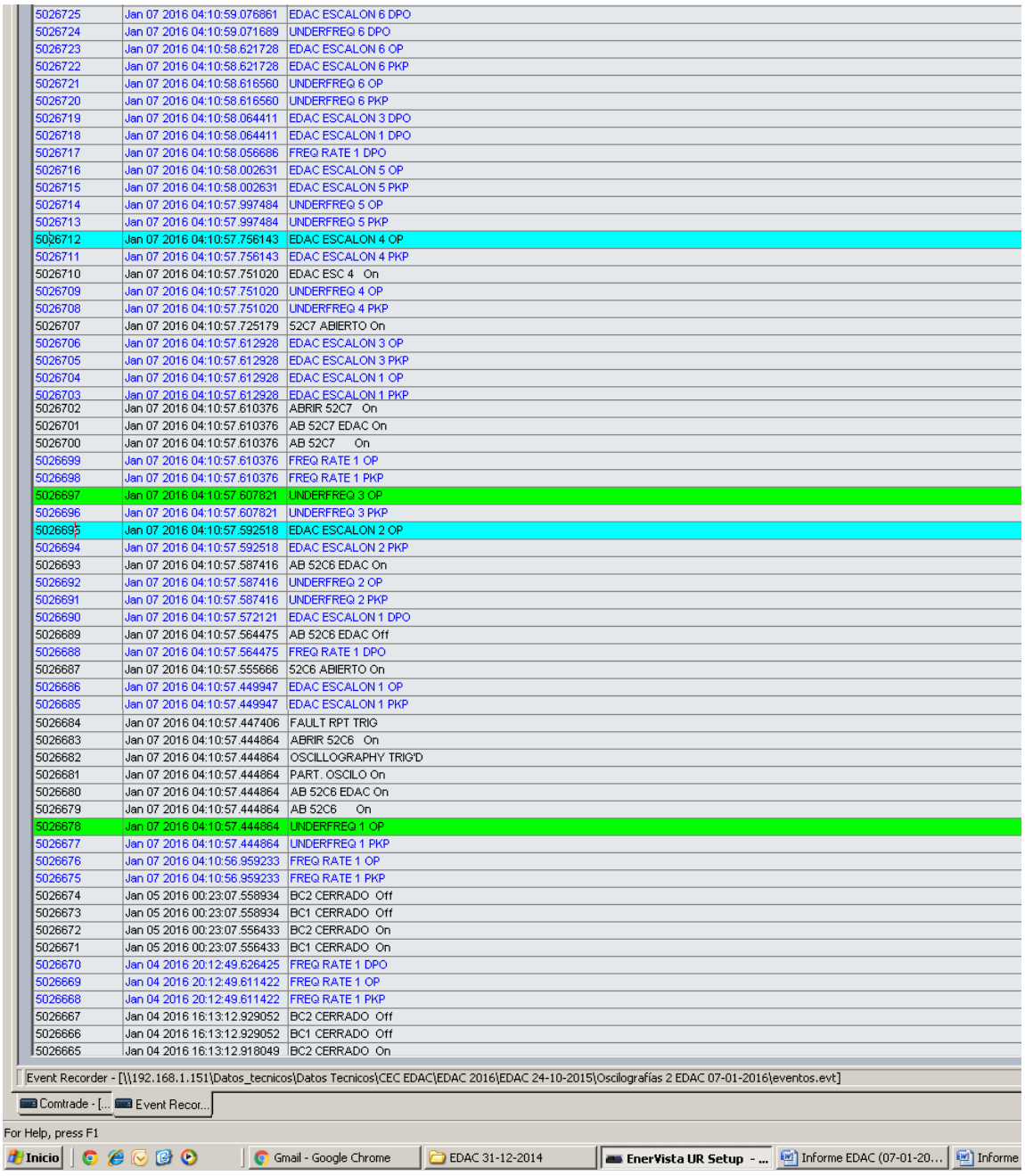
File Online Offline View Action Security Window Help

File Name: \\192.168.1.151\Datos_tecnicos\Datos Tecnicos\CEC EDAC\EDAC 2016\EDAC 24-10-2015\Oscilografías 2 EDAC 07-01-2016\eventos.evt

Shown Number of Events: 1024

0 days 0 h : 0 m : 9.704575 s

Event Number	Date/Time	Cause
5026774	Jan 07 2016 05:20:49.567584	DESCONECTANDO B2 PKP
5026773	Jan 07 2016 05:20:49.567584	DESCONECTANDO B1 OP
5026772	Jan 07 2016 05:20:49.567584	DESCONECTANDO B1 PKP
5026771	Jan 07 2016 05:18:36.472578	52C7 ABIERTO Off
5026770	Jan 07 2016 05:18:26.768003	52C6 ABIERTO Off
5026769	Jan 07 2016 04:14:44.149950	FREQ RATE 1 DPO
5026768	Jan 07 2016 04:14:43.992472	FREQ RATE 1 OP
5026767	Jan 07 2016 04:14:43.992472	FREQ RATE 1 PKP
5026766	Jan 07 2016 04:13:57.550323	DESCONECTANDO B2 DPO
5026765	Jan 07 2016 04:13:27.539032	DESCONECTANDO B1 DPO
5026764	Jan 07 2016 04:12:57.548439	DESCONECTANDO B2 OP
5026763	Jan 07 2016 04:12:57.548439	DESCONECTANDO B2 PKP
5026762	Jan 07 2016 04:12:57.548439	DESCONECTANDO B1 OP
5026761	Jan 07 2016 04:12:57.548439	DESCONECTANDO B1 PKP
5026760	Jan 07 2016 04:11:03.676313	ABRIR 52C6 Off
5026759	Jan 07 2016 04:11:03.676313	PART. OSCILO Off
5026758	Jan 07 2016 04:11:03.676313	AB 52C6 Off
5026757	Jan 07 2016 04:11:03.658446	UNDERFREQ 1 DPO
5026756	Jan 07 2016 04:11:03.280294	EDAC ESCALON 2 DPO
5026755	Jan 07 2016 04:11:03.275177	AB 52C6 EDAC Off
5026754	Jan 07 2016 04:11:03.275177	UNDERFREQ 2 DPO
5026753	Jan 07 2016 04:11:02.886062	UNDERFREQ 3 DPO
5026752	Jan 07 2016 04:11:01.717040	UNDERFREQ 3 OP
5026751	Jan 07 2016 04:11:01.717040	UNDERFREQ 3 PKP
5026750	Jan 07 2016 04:11:01.230850	EDAC ESCALON 2 OP
5026749	Jan 07 2016 04:11:01.230850	EDAC ESCALON 2 PKP
5026748	Jan 07 2016 04:11:01.228294	FAULT RPT TRIG
5026747	Jan 07 2016 04:11:01.225735	ABRIR 52C6 On
5026746	Jan 07 2016 04:11:01.225735	OSCILLOGRAPHY TRIG'D
5026745	Jan 07 2016 04:11:01.225735	PART. OSCILO On
5026744	Jan 07 2016 04:11:01.225735	AB 52C6 EDAC On
5026743	Jan 07 2016 04:11:01.225735	AB 52C6 On
5026742	Jan 07 2016 04:11:01.225735	UNDERFREQ 2 OP
5026741	Jan 07 2016 04:11:01.225735	UNDERFREQ 2 PKP
5026740	Jan 07 2016 04:11:00.727368	ABRIR 52C6 Off
5026739	Jan 07 2016 04:11:00.727368	PART. OSCILO Off
5026738	Jan 07 2016 04:11:00.727368	AB 52C6 Off
5026737	Jan 07 2016 04:11:00.331188	EDAC ESCALON 2 DPO
5026736	Jan 07 2016 04:11:00.326073	AB 52C6 EDAC Off
5026735	Jan 07 2016 04:11:00.326073	UNDERFREQ 2 DPO
5026734	Jan 07 2016 04:11:00.111135	ABRIR 52C7 Off
5026733	Jan 07 2016 04:11:00.111135	AB 52C7 Off
5026732	Jan 07 2016 04:10:59.916402	UNDERFREQ 3 DPO
5026731	Jan 07 2016 04:10:59.716170	EDAC ESCALON 4 DPO
5026730	Jan 07 2016 04:10:59.711034	EDAC ESC 4 Off
5026729	Jan 07 2016 04:10:59.711034	AB 52C7 EDAC Off
5026728	Jan 07 2016 04:10:59.711034	UNDERFREQ 4 DPO
5026727	Jan 07 2016 04:10:59.407414	EDAC ESCALON 5 DPO
5026726	Jan 07 2016 04:10:59.402260	UNDERFREQ 5 DPO



5026725	Jan 07 2016 04:10:59.076861	EDAC ESCALON 6 DPO
5026724	Jan 07 2016 04:10:59.071689	UNDERFREQ 6 DPO
5026723	Jan 07 2016 04:10:58.621728	EDAC ESCALON 6 OP
5026722	Jan 07 2016 04:10:58.621728	EDAC ESCALON 6 PKP
5026721	Jan 07 2016 04:10:58.616560	UNDERFREQ 6 OP
5026720	Jan 07 2016 04:10:58.616560	UNDERFREQ 6 PKP
5026719	Jan 07 2016 04:10:58.064411	EDAC ESCALON 3 DPO
5026718	Jan 07 2016 04:10:58.064411	EDAC ESCALON 1 DPO
5026717	Jan 07 2016 04:10:58.056686	FREQ RATE 1 DPO
5026716	Jan 07 2016 04:10:58.002631	EDAC ESCALON 5 OP
5026715	Jan 07 2016 04:10:58.002631	EDAC ESCALON 5 PKP
5026714	Jan 07 2016 04:10:57.997484	UNDERFREQ 5 OP
5026713	Jan 07 2016 04:10:57.997484	UNDERFREQ 5 PKP
5026712	Jan 07 2016 04:10:57.756143	EDAC ESCALON 4 OP
5026711	Jan 07 2016 04:10:57.756143	EDAC ESCALON 4 PKP
5026710	Jan 07 2016 04:10:57.751020	EDAC ESC 4 On
5026709	Jan 07 2016 04:10:57.751020	UNDERFREQ 4 OP
5026708	Jan 07 2016 04:10:57.751020	UNDERFREQ 4 PKP
5026707	Jan 07 2016 04:10:57.725179	52C7 ABIERTO On
5026706	Jan 07 2016 04:10:57.612928	EDAC ESCALON 3 OP
5026705	Jan 07 2016 04:10:57.612928	EDAC ESCALON 3 PKP
5026704	Jan 07 2016 04:10:57.612928	EDAC ESCALON 1 OP
5026703	Jan 07 2016 04:10:57.612928	EDAC ESCALON 1 PKP
5026702	Jan 07 2016 04:10:57.610376	ABRIR 52C7 On
5026701	Jan 07 2016 04:10:57.610376	AB 52C7 EDAC On
5026700	Jan 07 2016 04:10:57.610376	AB 52C7 On
5026699	Jan 07 2016 04:10:57.610376	FREQ RATE 1 OP
5026698	Jan 07 2016 04:10:57.610376	FREQ RATE 1 PKP
5026697	Jan 07 2016 04:10:57.607821	UNDERFREQ 3 OP
5026696	Jan 07 2016 04:10:57.607821	UNDERFREQ 3 PKP
5026695	Jan 07 2016 04:10:57.592518	EDAC ESCALON 2 OP
5026694	Jan 07 2016 04:10:57.592518	EDAC ESCALON 2 PKP
5026693	Jan 07 2016 04:10:57.587416	AB 52C6 EDAC On
5026692	Jan 07 2016 04:10:57.587416	UNDERFREQ 2 OP
5026691	Jan 07 2016 04:10:57.587416	UNDERFREQ 2 PKP
5026690	Jan 07 2016 04:10:57.572121	EDAC ESCALON 1 DPO
5026689	Jan 07 2016 04:10:57.564475	AB 52C6 EDAC Off
5026688	Jan 07 2016 04:10:57.564475	FREQ RATE 1 DPO
5026687	Jan 07 2016 04:10:57.555666	52C6 ABIERTO On
5026686	Jan 07 2016 04:10:57.449947	EDAC ESCALON 1 OP
5026685	Jan 07 2016 04:10:57.449947	EDAC ESCALON 1 PKP
5026684	Jan 07 2016 04:10:57.447406	FAULT RPT TRIG
5026683	Jan 07 2016 04:10:57.444864	ABRIR 52C6 On
5026682	Jan 07 2016 04:10:57.444864	OSCILLOGRAPHY TRIG'D
5026681	Jan 07 2016 04:10:57.444864	PART. OSCILO On
5026680	Jan 07 2016 04:10:57.444864	AB 52C6 EDAC On
5026679	Jan 07 2016 04:10:57.444864	AB 52C6 On
5026678	Jan 07 2016 04:10:57.444864	UNDERFREQ 1 OP
5026677	Jan 07 2016 04:10:57.444864	UNDERFREQ 1 PKP
5026676	Jan 07 2016 04:10:56.959233	FREQ RATE 1 OP
5026675	Jan 07 2016 04:10:56.959233	FREQ RATE 1 PKP
5026674	Jan 05 2016 00:23:07.558934	BC2 CERRADO Off
5026673	Jan 05 2016 00:23:07.558934	BC1 CERRADO Off
5026672	Jan 05 2016 00:23:07.556433	BC2 CERRADO On
5026671	Jan 05 2016 00:23:07.556433	BC1 CERRADO On
5026670	Jan 04 2016 20:12:49.626425	FREQ RATE 1 DPO
5026669	Jan 04 2016 20:12:49.611422	FREQ RATE 1 OP
5026668	Jan 04 2016 20:12:49.611422	FREQ RATE 1 PKP
5026667	Jan 04 2016 16:13:12.929052	BC2 CERRADO Off
5026666	Jan 04 2016 16:13:12.929052	BC1 CERRADO Off
5026665	Jan 04 2016 16:13:12.918049	BC2 CERRADO On

Nota: El horario se encuentra desplazado tres horas, debido a que los equipos se encuentran con hora en formato UTC.