

**ANEXO 6**  
**Análisis de Flujos de Potencia**



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## Indice General

En esta sección se presentan los resultado de los Estudios Básicos (años 2008 – 2011) correspondientes al Escenario Moderado, en Demanda Máxima de Invierno y sus contingencias, y en Demanda Máxima y Mínima de Verano, en Estado Estable.

Año 2008 Demanda Máxima de Invierno

Año 2008 Demanda Máxima de Verano

Año 2008 Demanda Mínima de Verano

Año 2008 Demanda Máxima de Invierno Contingencias en 230 kV y 115 kV

1. Llano Sánchez – Panamá II
2. Guasquitas - Veladero
3. Mata de Nance Veladero
4. Panamá – Cemento Panamá
5. Minas 2 - Chilibre
6. Minas 1 – Santa Rita

Año 2009 Demanda Máxima de Invierno

Año 2009 Demanda Máxima de Verano

Año 2009 Demanda Mínima de Verano

Año 2009 Demanda Máxima de Invierno Contingencias en 230 kV y 115 kV

1. Llano Sánchez – Panamá II
2. Guasquitas - Veladero
3. Mata de Nance Veladero
4. Panamá – Cemento Panamá
5. Minas 2 – Chilibre
6. Minas 1 – Santa Rita



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Año 2010 Demanda Máxima de Invierno

Año 2010 Demanda Máxima de Verano

Año 2010 Demanda Mínima de Verano

Año 2010 Demanda Máxima de Invierno Contingencias en 230 kV y 115 kV

1. Llano Sánchez – Panamá II
2. Guasquitas - Veladero
3. Mata de Nance Veladero
4. Panamá – Cemento Panamá
5. Minas 2 - Chilibre
6. Minas 1 – Santa Rita

Año 2011 Demanda Máxima de Invierno

Año 2011 Demanda Máxima de Verano

Año 2011 Demanda Mínima de Verano

Año 2011 Demanda Máxima de Invierno Contingencias en 230 kV y 115 kV

1. Llano Sánchez – Panamá II
2. Guasquitas - Veladero
3. Mata de Nance Veladero
4. Panamá – Cemento Panamá
5. Minas 2 – Chilibre
6. Minas 1 – Santa Rita



*de*

**PLAN DE EXPANSION DEL SIN CON CENTROAMERICA JUNIO DEL 2008  
AÑO 2008 ESCENARIO MODERADO DEMANDA MAXIMA INVIERNO**



*de*



PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E WED, DEC 26 2007 15:45  
P. EXP-SIN CON C.A. JUNIO 2008 ESC MOD DEM MAX INV  
AÑO 2008 ESTUDIOS BASICOS

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
8	LSA230			230.00	6	1.0085	231.95	11	M.N230			230.00	6	1.0197	234.53
14	PRO230			230.00	6	1.0246	235.65	96	FOR230			230.00	6	1.0159	233.65
100	BAY230			230.00	6	1.0113	232.61	144	CANJ230			230.00	6	1.0187	234.30
147	GUASQ230			230.00	6	1.0187	234.30	148	VELAD230			230.00	6	1.0220	235.07
190	CHANG230			230.00	6	1.0278	236.39	6000	FRONTER			230.00	6	1.0255	235.86

BUSES WITH VOLTAGE LESS THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
1	PAN230			230.00	6	0.9725	223.67	3	PANII230			230.00	6	0.9800	225.41
5	CHO230			230.00	6	0.9829	226.07	103	COPESA23			230.00	6	0.9850	226.56
105	PAN-AM23			230.00	6	0.9830	226.09	115	PACORA23			230.00	6	0.9904	227.80
511	LGUIAS230			230.00	6	0.9987	229.69	515	PANPOWER230			230.00	6	0.9888	227.43

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E WED, DEC 26 2007 15:46  
P. EXP-SIN CON C.A. JUNIO 2008 ESC MOD DEM MAX INV  
AÑO 2008 ESTUDIOS BASICOS

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2	PAN115			115.00	6	1.0045	115.52	4	PANII115			115.00	6	1.0070	115.80
6	CHO115			115.00	6	1.0218	117.51	9	LSA115			115.00	6	1.0123	116.42
12	M.N115			115.00	6	1.0095	116.10	15	PRO115			115.00	6	1.0229	117.63
18	CAC115			115.00	6	1.0041	115.47	20	CH.AZUL			115.00	6	1.0202	117.32
23	CH115			115.00	6	1.0065	115.75	33	STM115			115.00	6	1.0030	115.34
48	TINAJ115			115.00	6	1.0018	115.20	50	M.O115			115.00	6	1.0017	115.20
52	TOC115			115.00	6	1.0045	115.52	54	LM1115			115.00	6	1.0223	117.56
55	LM2115			115.00	6	1.0228	117.62	61	FFIELD			115.00	9	1.0166	116.91
87	CAL115			115.00	6	1.0129	116.48	88	EST115			115.00	6	1.0137	116.57
92	L.V115			115.00	6	1.0134	116.55	109	STA RITA115			115.00	6	1.0202	117.33
110	PTMD115A			115.00	6	1.0140	116.61	111	PTMD115B			115.00	6	1.0140	116.61
123	MIR115			115.00	7	1.0039	115.45	154	CEMPAN15			115.00	6	1.0172	116.98
191	CHANG115			115.00	6	1.0236	117.71	522	TBALBOA			115.00	6	1.0225	117.59

BUSES WITH VOLTAGE LESS THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
19	C.V115			115.00	6	0.9987	114.86	21	C.BAN115			115.00	6	0.9957	114.50
26	LOC115			115.00	6	0.9966	114.61	30	MAR115			115.00	6	0.9951	114.44
37	SAN115			115.00	6	0.9948	114.41								



*Handwritten signature or initials.*

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E WED, DEC 26 2007 15:45  
 P. EXP-SIN CON C.A. JUNIO 2008 ESC MOD DEM MAX INV  
 AÑO 2008 ESTUDIOS BASICOS

AREA 6 [PANAMA ] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING	
66		BLM13B		13.800	V2	30.0	12.7	17.0	0.0	1.0000	32.6	0.9211	47.0			1	6		
67		BLM13C		13.800	V3	30.0	12.7	17.0	0.0	1.0000	32.6	0.9211	47.0			1	6		
68		BLM13D		13.800	V4	30.0	13.2	30.0	0.0	1.0000	32.8	0.9149	47.0			1	6		
70		TGJB13A		13.800	J5	31.0	13.4	20.0	0.0	1.0000	33.8	0.9182	39.4			1	6		
73		BLMCCB		13.800	V9	47.0	14.8	40.0	0.0	1.0000	49.3	0.9541	71.0			1	6		
90		EST-13L		13.800	E1	22.0	-0.7	12.0	-5.0	0.9600	22.9	0.9995	27.0			1	6		
91		EST-13T		13.800	E2	22.0	-0.7	12.0	-5.0	0.9600	22.9	0.9995	27.0			1	6		
94		LV-13.8L		13.800	L1	25.0	-0.6	12.0	-5.0	0.9600	26.0	0.9997	27.0			1	6		
95		LV-13.8T		13.800	L2	25.0	2.7	12.0	-5.0	0.9700	25.9	0.9943	27.0			1	6		
97		FOR13A		13.800	F1	95.0	-27.0	50.0	-50.0	0.9800	100.8	0.9620	111.0			1	6		
98		FOR13B		13.800	F2	95.0	-27.0	50.0	-50.0	0.9800	100.8	0.9620	111.0			1	6		
99		FOR13C		13.800	F3	95.0	-27.0	50.0	-50.0	0.9800	100.8	0.9620	111.0			1	6		
101		BAY13A		13.800	B1	69.0	24.0	50.0	-25.0	0.9900	73.8	0.9446	96.0			1	6	SYST	
102		BAY13B		13.800	B2	68.9	24.0	50.0	-25.0	0.9900	73.7	0.9444	96.0			1	6		
106		PANAM13A		13.800	M1	13.5	3.6	9.0	0.0	0.9800	14.3	0.9654	20.7			1	6		
106		PANAM13A		13.800	M2	13.5	3.6	9.0	0.0	0.9800	14.3	0.9654	20.7			1	6		
106		PANAM13A		13.800	M3	13.5	3.6	9.0	0.0	0.9800	14.3	0.9654	20.7			1	6		
107		PANAM13B		13.800	M4	13.5	3.6	9.0	0.0	0.9800	14.3	0.9654	20.7			1	6		
107		PANAM13B		13.800	M5	13.5	3.6	9.0	0.0	0.9800	14.3	0.9654	20.7			1	6		
107		PANAM13B		13.800	M6	13.5	3.6	9.0	0.0	0.9800	14.3	0.9654	20.7			1	6		
108		BAY13C		13.800	B3	68.9	24.0	50.0	-25.0	0.9900	73.7	0.9444	100.0			1	6		
116		PACORA13		13.800	P1	14.0	3.8	8.8	0.0	1.0000	14.5	0.9642	21.7			1	6		
116		PACORA13		13.800	P2	14.0	3.8	8.8	0.0	1.0000	14.5	0.9642	21.7			1	6		
116		PACORA13		13.800	P3	14.0	3.8	8.8	0.0	1.0000	14.5	0.9642	21.7			1	6		
142		CANJ13A		13.800	C1	41.0	6.8	29.0	-29.0	0.9783	42.5	0.9865	69.0			1	6		
143		CANJ13B		13.800	C2	41.0	6.8	29.0	-29.0	0.9783	42.5	0.9865	69.0			1	6		
301		CONC13.8		13.800	C1	9.5	5.0	5.0	-5.0	0.9663	11.1	0.8849	13.5			1	6		
523		TBALBOA 13A		13.800	G1	8.2	-2.3	6.6	-6.6	0.9700	8.8	0.9641	10.9			1	6		
SUBSYSTEM TOTALS						976.4	108.2	622.0	-314.5				1336.0						

AREA 7 [ACANAL ] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING	
126		MIR13A		12.000	G1	8.6	0.0	5.0	0.0	1.0454	8.2	1.0000	13.5			2	7		
127		MIR13B		12.000	G2	8.6	0.0	5.0	0.0	1.0454	8.2	1.0000	13.5			2	7		
130		MIR13F		13.800	G5	10.7	5.3	8.0	0.0	1.0000	11.9	0.8960	27.7			2	7		
134		MAD6A		6.9000	G1	9.7	1.1	6.0	-6.0	1.0000	9.7	0.9937	13.0			2	7		
135		MAD6B		6.9000	G2	9.7	1.1	6.0	-6.0	1.0000	9.7	0.9937	13.0			2	7		
136		MAD6C		6.9000	G3	9.7	1.1	6.0	-6.0	1.0000	9.7	0.9937	13.0			2	7		
140		GAT6A		6.9000	G1	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9995	4.1			2	7		
140		GAT6A		6.9000	G2	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9995	4.1			2	7		
140		GAT6A		6.9000	G3	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9995	4.1			2	7		
141		GAT6B		6.9000	G4	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9853	5.6			2	7		
141		GAT6B		6.9000	G5	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9853	6.2			2	7		
141		GAT6B		6.9000	G6	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9853	6.2			2	7		
SUBSYSTEM TOTALS						74.3	6.7	51.0	-33.0				124.2						



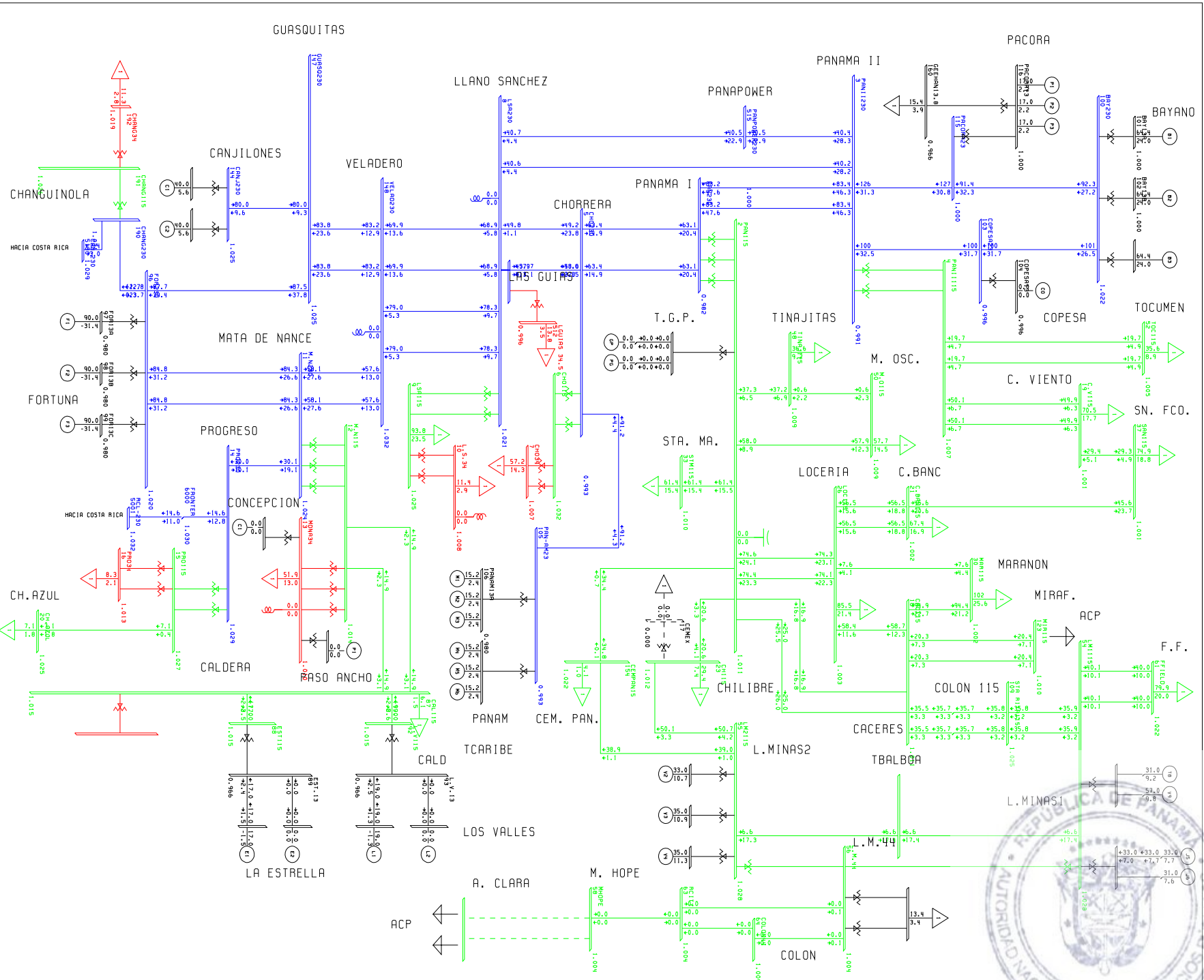
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**PLAN DE EXPANSION DEL SIN CON CENTROAMERICA JUNIO DEL 2008  
AÑO 2008 ESCENARIO MODERADO DEMANDA MAXIMA VERANO**



*de*





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PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E WED, DEC 26 2007 15:53  
P. EXP-SIN CON C.A. JUNIO 2008 ESC MOD DEM MAX VER  
AÑO 2008 ESTUDIOS BÁSICOS

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
8	LSA230	230.00	6	1.0208	234.79	11	M.N230	230.00	6	1.0244	235.62				
14	PRO230	230.00	6	1.0292	236.72	96	FOR230	230.00	6	1.0203	234.67				
100	BAY230	230.00	6	1.0215	234.95	115	PACORA23	230.00	6	1.0005	230.11				
144	CANJ230	230.00	6	1.0247	235.67	147	GUASQ230	230.00	6	1.0247	235.67				
148	VELAD230	230.00	6	1.0316	237.27	190	CHANG230	230.00	6	1.0306	237.04				
511	LGUIAS230	230.00	6	1.0106	232.45	515	PANPOWER230	230.00	6	1.0002	230.04				
6000	FRONTER	230.00	6	1.0301	236.92										

BUSES WITH VOLTAGE LESS THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
1	PAN230	230.00	6	0.9824	225.95	3	PANII230	230.00	6	0.9906	227.84				
5	CHO230	230.00	6	0.9930	228.39	103	COPESA23	230.00	6	0.9956	228.98				
105	PAN-AM23	230.00	6	0.9931	228.41										

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E WED, DEC 26 2007 15:53  
P. EXP-SIN CON C.A. JUNIO 2008 ESC MOD DEM MAX VER  
AÑO 2008 ESTUDIOS BÁSICOS

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2	PAN115	115.00	6	1.0114	116.31	4	PANII115	115.00	6	1.0075	115.86				
6	CHO115	115.00	6	1.0325	118.74	9	LSA115	115.00	6	1.0252	117.90				
12	M.N115	115.00	6	1.0144	116.65	15	PRO115	115.00	6	1.0275	118.16				
18	CAC115	115.00	6	1.0108	116.25	19	C.V115	115.00	6	1.0010	115.12				
20	CH.AZUL	115.00	6	1.0248	117.86	21	C.BAN115	115.00	6	1.0017	115.20				
23	CH115	115.00	6	1.0122	116.40	26	LOC115	115.00	6	1.0028	115.32				
30	MAR115	115.00	6	1.0016	115.18	33	STM115	115.00	6	1.0098	116.13				
37	SAN115	115.00	6	1.0005	115.06	48	TINAJ115	115.00	6	1.0086	115.99				
50	M.O115	115.00	6	1.0086	115.98	52	TOC115	115.00	6	1.0050	115.58				
54	LM1115	115.00	6	1.0276	118.18	55	LM2115	115.00	6	1.0279	118.20				
61	FFIELD	115.00	9	1.0220	117.53	87	CAL115	115.00	6	1.0145	116.67				
88	EST115	115.00	6	1.0147	116.70	92	L.V115	115.00	6	1.0146	116.68				
109	STA RITA115	115.00	6	1.0255	117.93	110	PTMD115A	115.00	6	1.0202	117.32				
111	PTMD115B	115.00	6	1.0202	117.32	123	MIR115	115.00	7	1.0102	116.18				
154	CEMPAN15	115.00	6	1.0225	117.58	191	CHANG115	115.00	6	1.0263	118.03				
522	TBALBOA	115	115.00	6	1.0277	118.19									

BUSES WITH VOLTAGE LESS THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)

\* NONE \*



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PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E WED, DEC 26 2007 15:54  
 P. EXP-SIN CON C.A. JUNIO 2008 ESC MOD DEM MAX VER  
 AÑO 2008 ESTUDIOS BÁSICOS

AREA 6 [PANAMA] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING	
66		BLM13B		13.800	V2	33.0	10.7	17.0	0.0	1.0000	34.7	0.9511	47.0			1	6		
67		BLM13C		13.800	V3	35.0	10.9	17.0	0.0	1.0000	36.6	0.9550	47.0			1	6		
68		BLM13D		13.800	V4	35.0	11.3	30.0	0.0	1.0000	36.8	0.9517	47.0			1	6		
70		TGJB13A		13.800	J5	33.0	7.7	20.0	0.0	1.0000	33.9	0.9741	39.4			1	6		
71		TGJB13B		13.800	J6	31.0	7.6	20.0	0.0	1.0000	31.9	0.9710	39.4			1	6		
72		BLMCCA		13.800	T8	31.0	9.2	20.0	0.0	1.0000	32.3	0.9587	50.0			1	6		
73		BLMCCB		13.800	V9	57.0	9.8	40.0	0.0	1.0000	57.8	0.9855	71.0			1	6		
90		EST-13L		13.800	E1	17.0	-1.5	12.0	-5.0	0.9600	17.8	0.9961	27.0			1	6		
94		LV-13.8L		13.800	L1	19.0	-1.3	12.0	-5.0	0.9600	19.8	0.9975	27.0			1	6		
97		FOR13A		13.800	F1	90.0	-31.4	50.0	-50.0	0.9800	97.3	0.9441	111.0			1	6		
98		FOR13B		13.800	F2	90.0	-31.4	50.0	-50.0	0.9800	97.3	0.9441	111.0			1	6		
99		FOR13C		13.800	F3	90.0	-31.4	50.0	-50.0	0.9800	97.3	0.9441	111.0			1	6		
101		BAY13A		13.800	B1	64.4	24.0	50.0	-25.0	1.0000	68.7	0.9373	96.0			1	6	SYST	
102		BAY13B		13.800	B2	64.4	24.0	50.0	-25.0	1.0000	68.7	0.9373	96.0			1	6		
106		PANAM13A		13.800	M1	15.2	2.4	9.0	0.0	0.9800	15.7	0.9875	20.7			1	6		
106		PANAM13A		13.800	M2	15.2	2.4	9.0	0.0	0.9800	15.7	0.9875	20.7			1	6		
106		PANAM13A		13.800	M3	15.2	2.4	9.0	0.0	0.9800	15.7	0.9875	20.7			1	6		
107		PANAM13B		13.800	M4	15.2	2.4	9.0	0.0	0.9800	15.7	0.9875	20.7			1	6		
107		PANAM13B		13.800	M5	15.2	2.4	9.0	0.0	0.9800	15.7	0.9875	20.7			1	6		
107		PANAM13B		13.800	M6	15.2	2.4	9.0	0.0	0.9800	15.7	0.9875	20.7			1	6		
108		BAY13C		13.800	B3	64.4	24.0	50.0	-25.0	1.0000	68.7	0.9373	100.0			1	6		
116		PACORA13		13.800	P1	17.0	2.2	8.8	0.0	1.0000	17.1	0.9915	21.7			1	6		
116		PACORA13		13.800	P2	17.0	2.2	8.8	0.0	1.0000	17.1	0.9915	21.7			1	6		
116		PACORA13		13.800	P3	17.0	2.2	8.8	0.0	1.0000	17.1	0.9915	21.7			1	6		
142		CANJ13A		13.800	C1	40.0	5.6	29.0	-29.0	0.9783	41.3	0.9904	69.0			1	6		
143		CANJ13B		13.800	C2	40.0	5.6	29.0	-29.0	0.9783	41.3	0.9904	69.0			1	6		
SUBSYSTEM TOTALS						976.4	74.3	626.5	-293.0				1347.0						

AREA 7 [ACANAL] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING			
126		MIR13A		12.000	G1	8.6	0.0	5.0	0.0	1.0488	8.2	1.0000	13.5			2	7				
127		MIR13B		12.000	G2	8.6	0.0	5.0	0.0	1.0488	8.2	1.0000	13.5			2	7				
130		MIR13F		13.800	G5	9.7	3.8	8.0	0.0	1.0000	10.4	0.9313	27.7			2	7				
134		MAD6A		6.9000	G1	9.7	0.9	6.0	-6.0	1.0000	9.7	0.9956	13.0			2	7				
135		MAD6B		6.9000	G2	9.7	0.9	6.0	-6.0	1.0000	9.7	0.9957	13.0			2	7				
136		MAD6C		6.9000	G3	9.7	0.9	6.0	-6.0	1.0000	9.7	0.9957	13.0			2	7				
140		GAT6A		6.9000	G1	1.9	0.0	2.0	-2.0	1.0000	1.9	1.0000	4.1			2	7				
140		GAT6A		6.9000	G2	1.9	0.0	2.0	-2.0	1.0000	1.9	1.0000	4.1			2	7				
140		GAT6A		6.9000	G3	1.9	0.0	2.0	-2.0	1.0000	1.9	1.0000	4.1			2	7				
141		GAT6B		6.9000	G4	3.9	-0.7	3.0	-3.0	1.0000	4.0	0.9834	5.6			2	7				
141		GAT6B		6.9000	G5	3.9	-0.7	3.0	-3.0	1.0000	4.0	0.9834	6.2			2	7				
141		GAT6B		6.9000	G6	3.9	-0.7	3.0	-3.0	1.0000	4.0	0.9834	6.2			2	7				
SUBSYSTEM TOTALS									73.4	4.4	51.0	-33.0									

124.2

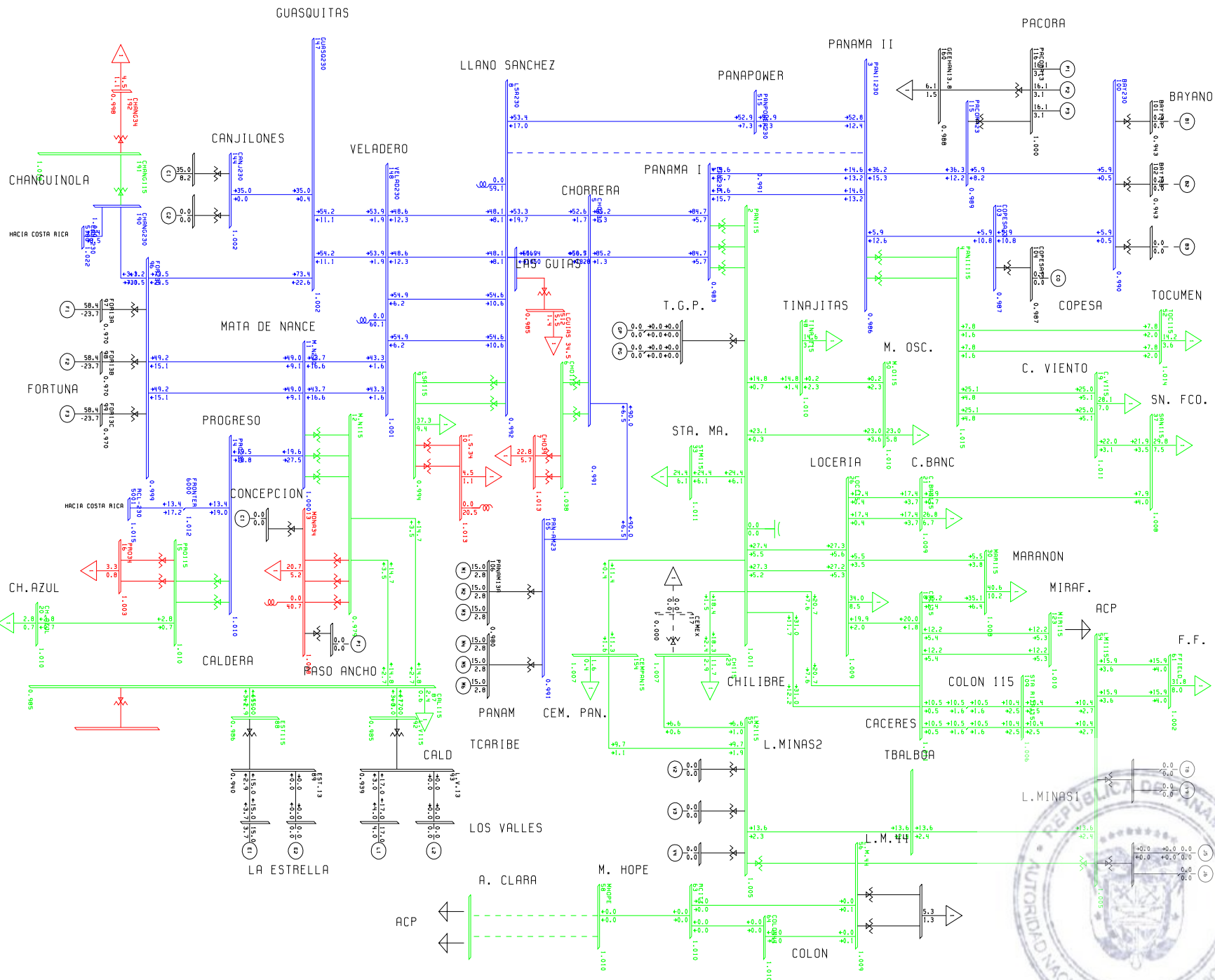


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**PLAN DE EXPANSION DEL SIN CON CENTROAMERICA JUNIO DEL 2008  
AÑO 2008 ESCENARIO MODERADO DEMANDA MINIMA VERANO**



*de*



*Handwritten signature or initials.*

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E WED, DEC 26 2007 16:00  
P. EXP-SIN CON C.A. JUNIO 2008 ESC MOD DEM MIN VERANO  
Año 2008 ESTUDIOS BÁSICOS

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
11	M.	N230		230.00	6	1.0000	230.00	14	PRO230			230.00	6	1.0103	232.38
144	CANJ	230		230.00	6	1.0016	230.37	147	GUASQ230			230.00	6	1.0015	230.36
148	VELAD	230		230.00	6	1.0005	230.13	190	CHANG230			230.00	6	1.0199	234.57
6000	FRONTER			230.00	6	1.0118	232.72								

BUSES WITH VOLTAGE LESS THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
1	PAN	230		230.00	6	0.9834	226.18	3	PANII230			230.00	6	0.9856	226.69
5	CHO	230		230.00	6	0.9905	227.82	8	LSA230			230.00	6	0.9921	228.19
96	FOR	230		230.00	6	0.9991	229.80	100	BAY230			230.00	6	0.9905	227.80
103	COPE	SA23		230.00	6	0.9868	226.97	105	PAN-AM23			230.00	6	0.9906	227.83
115	PACORA	23		230.00	6	0.9893	227.54	511	LGUIAS230			230.00	6	0.9939	228.61
515	PANPOWER	230		230.00	6	0.9907	227.85								

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E WED, DEC 26 2007 16:00  
P. EXP-SIN CON C.A. JUNIO 2008 ESC MOD DEM MIN VERANO  
Año 2008 ESTUDIOS BÁSICOS

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2	PAN	115		115.00	6	1.0112	116.28	4	PANII115			115.00	6	1.0152	116.75
6	CHO	115		115.00	6	1.0384	119.41	15	PRO115			115.00	6	1.0102	116.18
18	CAC	115		115.00	6	1.0109	116.25	19	C.V115			115.00	6	1.0114	116.31
20	CH.	AZUL		115.00	6	1.0096	116.11	21	C.BAN115			115.00	6	1.0085	115.98
23	CH	115		115.00	6	1.0066	115.76	26	LOC115			115.00	6	1.0087	116.00
30	MAR	115		115.00	6	1.0077	115.89	33	STM115			115.00	6	1.0105	116.21
37	SAN	115		115.00	6	1.0084	115.96	48	TINAJ115			115.00	6	1.0104	116.19
50	M.O	115		115.00	6	1.0104	116.19	52	TOC115			115.00	6	1.0143	116.64
54	LM	115		115.00	6	1.0047	115.54	55	LM2115			115.00	6	1.0048	115.55
61	FFIELD			115.00	9	1.0024	115.28	109	STA RITA115			115.00	6	1.0057	115.65
110	PTMD	115A		115.00	6	1.0081	115.93	111	PTMD115B			115.00	6	1.0081	115.93
123	MIR	115		115.00	7	1.0101	116.16	154	CEMPAN15			115.00	6	1.0069	115.79
191	CHANG	115		115.00	6	1.0183	117.10	522	TBALBOA 115			115.00	6	1.0047	115.55

BUSES WITH VOLTAGE LESS THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
9	LSA	115		115.00	6	0.9935	114.26	12	M.N115			115.00	6	0.9792	112.61
87	CAL	115		115.00	6	0.9850	113.27	88	EST115			115.00	6	0.9862	113.42
92	L.V	115		115.00	6	0.9854	113.33								



*Handwritten signature or initials.*

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
 P. EXP-SIN CON C.A. JUNIO 2008 ESC MOD DEM MIN VERANO  
 AÑO 2008 ESTUDIOS BÁSICOS

WED, DEC 26 2007 16:00

AREA 6 [PANAMA ] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING	
90	EST-13L	13.800	E1	15.0	3.7	12.0	-5.0	0.9500	16.3	0.9713	27.0	1	6						
94	LV-13.8L	13.800	L1	17.0	4.0	12.0	-5.0	0.9500	18.4	0.9733	27.0	1	6						
97	FOR13A	13.800	F1	58.4	-23.7	50.0	-50.0	0.9700	65.0	0.9263	111.0	1	6					SYST	
98	FOR13B	13.800	F2	58.4	-23.7	50.0	-50.0	0.9700	65.0	0.9263	111.0	1	6						
99	FOR13C	13.800	F3	58.4	-23.7	50.0	-50.0	0.9700	65.0	0.9263	111.0	1	6						
106	PANAM13A	13.800	M1	15.0	2.8	9.0	0.0	0.9800	15.6	0.9836	20.7	1	6						
106	PANAM13A	13.800	M2	15.0	2.8	9.0	0.0	0.9800	15.6	0.9836	20.7	1	6						
106	PANAM13A	13.800	M3	15.0	2.8	9.0	0.0	0.9800	15.6	0.9836	20.7	1	6						
107	PANAM13B	13.800	M4	15.0	2.8	9.0	0.0	0.9800	15.6	0.9836	20.7	1	6						
107	PANAM13B	13.800	M5	15.0	2.8	9.0	0.0	0.9800	15.6	0.9836	20.7	1	6						
107	PANAM13B	13.800	M6	15.0	2.8	9.0	0.0	0.9800	15.6	0.9836	20.7	1	6						
116	PACORA13	13.800	P1	16.1	3.1	8.8	0.0	1.0000	16.4	0.9821	21.7	1	6						
116	PACORA13	13.800	P2	16.1	3.1	8.8	0.0	1.0000	16.4	0.9821	21.7	1	6						
116	PACORA13	13.800	P3	16.1	3.1	8.8	0.0	1.0000	16.4	0.9821	21.7	1	6						
142	CANJ13A	13.800	C1	35.0	8.2	29.0	-29.0	0.9800	36.7	0.9734	69.0	1	6						
SUBSYSTEM TOTALS						380.4	-29.5	283.5	-189.0			645.1							

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
 P. EXP-SIN CON C.A. JUNIO 2008 ESC MOD DEM MIN VERANO  
 AÑO 2008 ESTUDIOS BÁSICOS

WED, DEC 26 2007 16:00

AREA 7 [ACANAL ] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING	
135	MAD6B	6.9000	G2	10.0	1.2	6.0	-6.0	1.0000	10.1	0.9932	13.0	2	7						
136	MAD6C	6.9000	G3	10.0	1.2	6.0	-6.0	1.0000	10.1	0.9932	13.0	2	7						
140	GAT6A	6.9000	G1	2.0	-0.1	2.0	-2.0	1.0000	2.0	0.9976	4.1	2	7						
140	GAT6A	6.9000	G2	2.0	-0.1	2.0	-2.0	1.0000	2.0	0.9976	4.1	2	7						
140	GAT6A	6.9000	G3	2.0	-0.1	2.0	-2.0	1.0000	2.0	0.9976	4.1	2	7						
141	GAT6B	6.9000	G4	4.0	-0.9	3.0	-3.0	1.0000	4.1	0.9771	5.6	2	7						
141	GAT6B	6.9000	G5	4.0	-0.9	3.0	-3.0	1.0000	4.1	0.9771	6.2	2	7						
141	GAT6B	6.9000	G6	4.0	-0.9	3.0	-3.0	1.0000	4.1	0.9771	6.2	2	7						
SUBSYSTEM TOTALS						38.0	-0.7	27.0	-27.0			56.4							



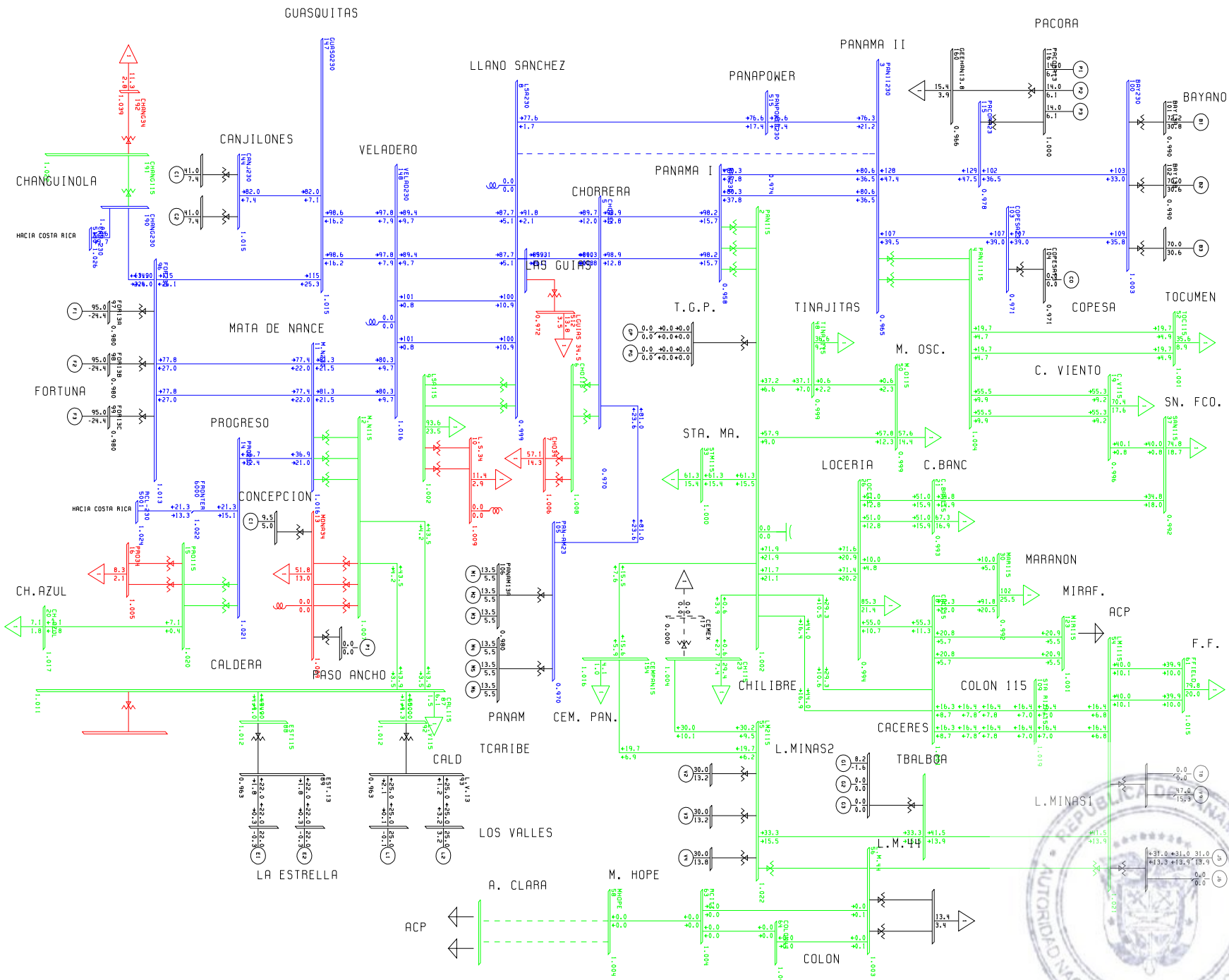
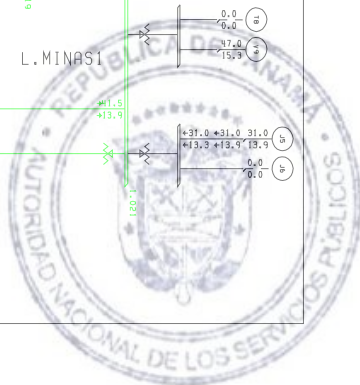
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PLAN DE EXPANSION DEL SIN CON CENTROAMERICA JUNIO DEL 2008  
AÑO 2008 ESCENARIO MODERADO DEMANDA MAXIMA INVIERNO  
Contingencia 1: Llano Sánchez - Panamá II



*de*





P. EXP-SIN CON C.A.R. JUNIO 2008 DEM MAX INV ESTUDIOS BASICO  
R 0 2008 CONT 1 LLANO SANCHEZ-PAN II  
THU, DEC 27 2007 13:07  
KVA: 514 . 535 . 5115  
BUS - VOLTAGE (KV)  
BRANCH - MW/MVAR  
EQUIPMENT - MW/MVAR

## Contingencia 1: Llano Sánchez- Panamá II

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E WED, DEC 26 2007 14:44  
 P. EXP-SIN CON C.A. JUNIO 2008 DEM MAX INV ESTUDIOS BASICOS  
 AÑO 2008 CONT 1 LLANO SANCHEZ-PMA II

### BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
11	M.	N230		230.00	6	1.0161	233.71	14	PRO	230		230.00	6	1.0214	234.92
96	FOR	230		230.00	6	1.0130	232.98	100	BAY	230		230.00	6	1.0025	230.58
144	CANJ	230		230.00	6	1.0151	233.46	147	GUASQ	230		230.00	6	1.0150	233.45
148	VELAD	230		230.00	6	1.0160	233.69	190	CHANG	230		230.00	6	1.0259	235.97
6000	FRONTER			230.00	6	1.0224	235.14								

### BUSES WITH VOLTAGE LESS THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
1	PAN	230		230.00	6	0.9578	220.28	3	PANII	230		230.00	6	0.9648	221.91
5	CHO	230		230.00	6	0.9699	223.08	8	LSA	230		230.00	6	0.9989	229.76
103	COPE	SA23		230.00	6	0.9708	223.28	105	PAN-AM	23		230.00	6	0.9700	223.10
115	PACOR	A23		230.00	6	0.9778	224.90	511	LGUIAS	230		230.00	6	0.9869	226.99
515	PANPOWER	230		230.00	6	0.9739	223.99								

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E WED, DEC 26 2007 14:44  
 P. EXP-SIN CON C.A. JUNIO 2008 DEM MAX INV ESTUDIOS BASICOS  
 AÑO 2008 CONT 1 LLANO SANCHEZ-PMA II

### BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2	PAN	115		115.00	6	1.0019	115.22	4	PANII	115		115.00	6	1.0037	115.42
6	CHO	115		115.00	6	1.0078	115.90	9	LSA	115		115.00	6	1.0022	115.25
12	M.	N115		115.00	6	1.0068	115.79	15	PRO	115		115.00	6	1.0196	117.26
18	CAC	115		115.00	6	1.0015	115.17	20	CH.	AZUL		115.00	6	1.0170	116.95
23	CH	115		115.00	6	1.0044	115.51	33	STM	115		115.00	6	1.0003	115.04
52	TOC	115		115.00	6	1.0012	115.14	54	LM	115		115.00	6	1.0211	117.42
55	LM	2115		115.00	6	1.0216	117.48	61	FF	FIELD		115.00	9	1.0154	116.77
87	CAL	115		115.00	6	1.0111	116.27	88	EST	115		115.00	6	1.0121	116.39
92	L.	V115		115.00	6	1.0117	116.35	109	STA	RITA	115		6	1.0189	117.17
110	PTMD	115A		115.00	6	1.0120	116.39	111	PTMD	115B		115.00	6	1.0120	116.39
123	MIR	115		115.00	7	1.0014	115.16	154	CEMPAN	15		115.00	6	1.0156	116.79
191	CHANG	115		115.00	6	1.0217	117.50	522	TBALBOA	115		115.00	6	1.0213	117.45

### BUSES WITH VOLTAGE LESS THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	
19	C.	V115		115.00	6	0.9956	114.49	21	C.	BAN	115		115.00	6	0.9929	114.18
26	LOC	115		115.00	6	0.9939	114.29	30	MAR	115		115.00	6	0.9924	114.12	
37	SAN	115		115.00	6	0.9920	114.08	48	TINAJ	115		115.00	6	0.9991	114.90	
50	M.	O115		115.00	6	0.9991	114.89									

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E WED, DEC 26 2007 14:41  
 P. EXP-SIN CON C.A. JUNIO 2008 DEM MAX INV ESTUDIOS BASICO  
 AÑO 2008 CONT 1 LLANO SANCHEZ-PMA II

### AREA 6 [PANAMA] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVBASE	X T R A N	GENTAP	ZONE	AREA	SWING
------	-----	------	-----	-------	----	----	------	------	------	-------	---------	----	--------	-----------	--------	------	------	-------



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66	BLM13B	13.800	V2	30.0	13.2	17.0	0.0	1.0000	32.8	0.9153	47.0	1	6										
67	BLM13C	13.800	V3	30.0	13.2	17.0	0.0	1.0000	32.8	0.9153	47.0	1	6										
68	BLM13D	13.800	V4	30.0	13.8	30.0	0.0	1.0000	33.0	0.9087	47.0	1	6										
70	TGJB13A	13.800	J5	31.0	13.9	20.0	0.0	1.0000	34.0	0.9123	39.4	1	6										
73	BLMCCB	13.800	V9	47.0	15.3	40.0	0.0	1.0000	49.4	0.9509	71.0	1	6										
90	EST-13L	13.800	E1	22.0	-0.3	12.0	-5.0	0.9600	22.9	0.9999	27.0	1	6										
91	EST-13T	13.800	E2	22.0	-0.3	12.0	-5.0	0.9600	22.9	0.9999	27.0	1	6										
94	LV-13.8L	13.800	L1	25.0	-0.1	12.0	-5.0	0.9600	26.0	1.0000	27.0	1	6										
95	LV-13.8T	13.800	L2	25.0	3.2	12.0	-5.0	0.9700	26.0	0.9920	27.0	1	6										
97	FOR13A	13.800	F1	95.0	-24.4	50.0	-50.0	0.9800	100.1	0.9687	111.0	1	6										
98	FOR13B	13.800	F2	95.0	-24.4	50.0	-50.0	0.9800	100.1	0.9687	111.0	1	6										
99	FOR13C	13.800	F3	95.0	-24.4	50.0	-50.0	0.9800	100.1	0.9687	111.0	1	6										
101	BAY13A	13.800	B1	72.2	30.8	50.0	-25.0	0.9900	79.2	0.9197	96.0	1	6 SYST										
102	BAY13B	13.800	B2	69.9	30.6	50.0	-25.0	0.9900	77.1	0.9162	96.0	1	6										
106	PANAM13A	13.800	M1	13.5	5.5	9.0	0.0	0.9800	14.9	0.9272	20.7	1	6										
106	PANAM13A	13.800	M2	13.5	5.5	9.0	0.0	0.9800	14.9	0.9272	20.7	1	6										
106	PANAM13A	13.800	M3	13.5	5.5	9.0	0.0	0.9800	14.9	0.9272	20.7	1	6										
107	PANAM13B	13.800	M4	13.5	5.5	9.0	0.0	0.9800	14.9	0.9272	20.7	1	6										
107	PANAM13B	13.800	M5	13.5	5.5	9.0	0.0	0.9800	14.9	0.9272	20.7	1	6										
107	PANAM13B	13.800	M6	13.5	5.5	9.0	0.0	0.9800	14.9	0.9272	20.7	1	6										
108	BAY13C	13.800	B3	69.9	30.6	50.0	-25.0	0.9900	77.1	0.9162	100.0	1	6										
116	PACORA13	13.800	P1	14.0	6.1	8.8	0.0	1.0000	15.3	0.9161	21.7	1	6										
116	PACORA13	13.800	P2	14.0	6.1	8.8	0.0	1.0000	15.3	0.9161	21.7	1	6										
116	PACORA13	13.800	P3	14.0	6.1	8.8	0.0	1.0000	15.3	0.9161	21.7	1	6										
142	CANJ13A	13.800	C1	41.0	7.4	29.0	-29.0	0.9783	42.6	0.9842	69.0	1	6										
143	CANJ13B	13.800	C2	41.0	7.4	29.0	-29.0	0.9783	42.6	0.9842	69.0	1	6										
301	CONC13.8	13.800	C1	9.5	5.0	5.0	-5.0	0.9637	11.1	0.8849	13.5	1	6										
523	TBALBOA 13A	13.800	G1	8.2	-1.6	6.6	-6.6	0.9700	8.6	0.9823	10.9	1	6										
SUBSYSTEM TOTALS				981.8	160.2	622.0	-314.5				1336.0												
AREA 7 [ACANAL ] MACHINE SUMMARY:																							
BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X	T	R	A	N	GENTAP	ZONE	AREA	SWING	
126		MIR13A		12.000	G1	8.6	0.0	5.0	0.0	1.0441	8.2	1.0000	13.5	2							7		
127		MIR13B		12.000	G2	8.6	0.0	5.0	0.0	1.0441	8.2	1.0000	13.5	2							7		
130		MIR13F		13.800	G5	10.7	5.9	8.0	0.0	1.0000	12.2	0.8765	27.7	2							7		
134		MAD6A		6.9000	G1	9.7	1.2	6.0	-6.0	1.0000	9.7	0.9928	13.0	2							7		
135		MAD6B		6.9000	G2	9.7	1.2	6.0	-6.0	1.0000	9.7	0.9929	13.0	2							7		
136		MAD6C		6.9000	G3	9.7	1.2	6.0	-6.0	1.0000	9.7	0.9929	13.0	2							7		
140		GAT6A		6.9000	G1	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9991	4.1	2							7		
140		GAT6A		6.9000	G2	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9991	4.1	2							7		
140		GAT6A		6.9000	G3	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9991	4.1	2							7		
141		GAT6B		6.9000	G4	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9861	5.6	2							7		
141		GAT6B		6.9000	G5	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9861	6.2	2							7		
141		GAT6B		6.9000	G6	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9861	6.2	2							7		
SUBSYSTEM TOTALS				74.3	7.6	51.0	-33.0							124.2									

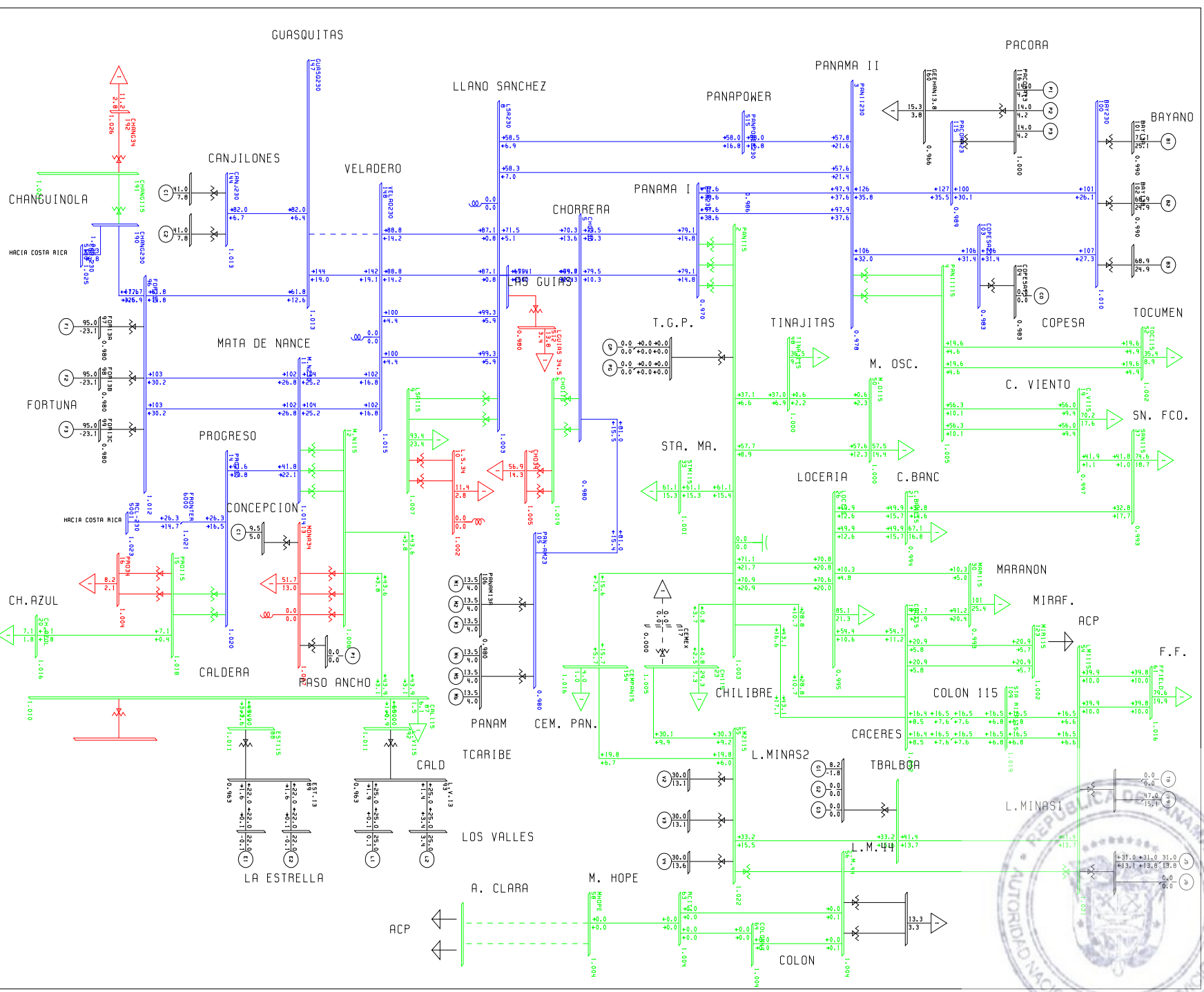


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**PLAN DE EXPANSION DEL SIN CON CENTROAMERICA JUNIO DEL 2008**  
**AÑO 2008 ESCENARIO MODERADO DEMANDA MAXIMA INVIERNO**  
**Contingencia 2: Guasquitas-Veladero**



*de*



P. EXP-SIN CON C.R. JUNIO 2008 MITZH ESC MOD DEM MAX INV  
 R 0 2008 ESTUDIOS BASICOS CNT2 GUASQUITAS-VELADERO  
 THU, DEC 27 2007 13:09

KV: 114 , \*35 , \*115

BUS - VOLTAGE (KV)  
 BRANCH - MW/MVAR  
 EQUIPMENT - MW/MVAR

## Contingencia 2: Guasquitas-Veladero

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
 P. EXP-SIN CON C.A. JUNIO 2008 ESC MOD DEM MAX INV  
 Año 2008 ESTUDIOS BASICOS CNT2 GUASQUITAS-VELADERO

WED, DEC 26 2007 16:32

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
8	LSA230	230.00	6	1.0034	230.78		
14	PRO230	230.00	6	1.0199	234.59		
100	BAY230	230.00	6	1.0101	232.33		
147	GUASQ230	230.00	6	1.0126	232.91		
190	CHANG230	230.00	6	1.0249	235.73		
BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
11	M.N230	230.00	6	1.0145	233.33		
96	FOR230	230.00	6	1.0115	232.66		
144	CANJ230	230.00	6	1.0127	232.92		
148	VELAD230	230.00	6	1.0153	233.51		
6000	FRONTER	230.00	6	1.0210	234.82		

BUSES WITH VOLTAGE LESS THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
1	PAN230	230.00	6	0.9704	223.18		
5	CHO230	230.00	6	0.9804	225.49		
105	PAN-AM23	230.00	6	0.9805	225.51		
511	LGUIAS230	230.00	6	0.9946	228.76		
BUS#	X--	NAME	--X	BASKV <td>AREA</td> <td>V(PU)</td> <td>V(KV)</td>	AREA	V(PU)	V(KV)
3	PANII230	230.00	6	0.9779	224.92		
103	COPESA23	230.00	6	0.9830	226.10		
115	PACORA23	230.00	6	0.9887	227.40		
515	PANPOWER230	230.00	6	0.9862	226.81		

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
 P. EXP-SIN CON C.A. JUNIO 2008 ESC MOD DEM MAX INV  
 Año 2008 ESTUDIOS BASICOS CNT2 GUASQUITAS-VELADERO

WED, DEC 26 2007 16:32

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2	PAN115	115.00	6	1.0026	115.30		
6	CHO115	115.00	6	1.0191	117.19		
12	M.N115	115.00	6	1.0056	115.64		
18	CAC115	115.00	6	1.0021	115.25		
23	CH115	115.00	6	1.0050	115.57		
52	TOC115	115.00	6	1.0024	115.27		
55	LM2115	115.00	6	1.0219	117.52		
87	CAL115	115.00	6	1.0102	116.18		
92	L.V115	115.00	6	1.0109	116.25		
110	PTMD115A	115.00	6	1.0126	116.44		
123	MIR115	115.00	7	1.0021	115.24		
191	CHANG115	115.00	6	1.0206	117.37		
BUS#	X--	NAME	--X	BASKV <td>AREA</td> <td>V(PU)</td> <td>V(KV)</td>	AREA	V(PU)	V(KV)
4	PANII115	115.00	6	1.0048	115.56		
9	LSA115	115.00	6	1.0070	115.80		
15	PRO115	115.00	6	1.0182	117.09		
20	CH.AZUL	115.00	6	1.0155	116.79		
33	STM115	115.00	6	1.0010	115.12		
54	LM1115	115.00	6	1.0214	117.46		
61	FFIELD	115.00	9	1.0157	116.81		
88	EST115	115.00	6	1.0113	116.30		
109	STA RITA115	115.00	6	1.0192	117.21		
111	PTMD115B	115.00	6	1.0126	116.44		
154	CEMPAN15	115.00	6	1.0160	116.84		
522	TBALBOA	115	115.00	6	1.0217	117.49	

BUSES WITH VOLTAGE LESS THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
19	C.V115	115.00	6	0.9966	114.61		
26	LOC115	115.00	6	0.9946	114.38		
37	SAN115	115.00	6	0.9928	114.18		
50	M.O115	115.00	6	0.9997	114.97		
BUS#	X--	NAME	--X	BASKV <td>AREA</td> <td>V(PU)</td> <td>V(KV)</td>	AREA	V(PU)	V(KV)
21	C.BAN115	115.00	6	0.9937	114.27		
30	MAR115	115.00	6	0.9931	114.21		
48	TINAJ115	115.00	6	0.9998	114.98		

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
 P. EXP-SIN CON C.A. JUNIO 2008 ESC MOD DEM MAX INV  
 Año 2008 ESTUDIOS BASICOS CNT2 GUASQUITAS-VELADERO

WED, DEC 26 2007 16:33

AREA 6 [PANAMA] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING	
66	BLM13B	13.800	V2	30.0		30.0	13.1	17.0	0.0	1.0000	32.7	0.9169	47.0					1	6



*Handwritten signature or initials.*

67	BLM13C	13.800	V3	30.0	13.1	17.0	0.0	1.0000	32.7	0.9169	47.0	1	6
68	BLM13D	13.800	V4	30.0	13.6	30.0	0.0	1.0000	33.0	0.9104	47.0	1	6
70	TGJB13A	13.800	J5	31.0	13.8	20.0	0.0	1.0000	33.9	0.9140	39.4	1	6
73	BLMCCB	13.800	V9	47.0	15.1	40.0	0.0	1.0000	49.4	0.9518	71.0	1	6
90	EST-13L	13.800	E1	22.0	-0.1	12.0	-5.0	0.9600	22.9	1.0000	27.0	1	6
91	EST-13T	13.800	E2	22.0	-0.1	12.0	-5.0	0.9600	22.9	1.0000	27.0	1	6
94	LV-13.8L	13.800	L1	25.0	0.1	12.0	-5.0	0.9600	26.0	1.0000	27.0	1	6
95	LV-13.8T	13.800	L2	25.0	3.4	12.0	-5.0	0.9700	26.0	0.9908	27.0	1	6
97	FOR13A	13.800	F1	95.0	-23.1	50.0	-50.0	0.9800	99.8	0.9717	111.0	1	6
98	FOR13B	13.800	F2	95.0	-23.1	50.0	-50.0	0.9800	99.8	0.9717	111.0	1	6
99	FOR13C	13.800	F3	95.0	-23.1	50.0	-50.0	0.9800	99.8	0.9717	111.0	1	6
101	BAY13A	13.800	B1	71.1	25.1	50.0	-25.0	0.9900	76.2	0.9431	96.0	1	6
102	BAY13B	13.800	B2	68.9	24.9	50.0	-25.0	0.9900	74.0	0.9406	96.0	1	6
106	PANAM13A	13.800	M1	13.5	4.0	9.0	0.0	0.9800	14.4	0.9588	20.7	1	6
106	PANAM13A	13.800	M2	13.5	4.0	9.0	0.0	0.9800	14.4	0.9588	20.7	1	6
106	PANAM13A	13.800	M3	13.5	4.0	9.0	0.0	0.9800	14.4	0.9588	20.7	1	6
107	PANAM13B	13.800	M4	13.5	4.0	9.0	0.0	0.9800	14.4	0.9588	20.7	1	6
107	PANAM13B	13.800	M5	13.5	4.0	9.0	0.0	0.9800	14.4	0.9588	20.7	1	6
107	PANAM13B	13.800	M6	13.5	4.0	9.0	0.0	0.9800	14.4	0.9588	20.7	1	6
108	BAY13C	13.800	B3	68.9	24.9	50.0	-25.0	0.9900	74.0	0.9406	100.0	1	6
116	PACORA13	13.800	P1	14.0	4.2	8.8	0.0	1.0000	14.6	0.9585	21.7	1	6
116	PACORA13	13.800	P2	14.0	4.2	8.8	0.0	1.0000	14.6	0.9585	21.7	1	6
116	PACORA13	13.800	P3	14.0	4.2	8.8	0.0	1.0000	14.6	0.9585	21.7	1	6
142	CANJ13A	13.800	C1	41.0	7.8	29.0	-29.0	0.9783	42.7	0.9826	69.0	1	6
143	CANJ13B	13.800	C2	41.0	7.8	29.0	-29.0	0.9783	42.7	0.9826	69.0	1	6
301	CONC13.8	13.800	C1	9.5	5.0	5.0	-5.0	0.9625	11.2	0.8849	13.5	1	6
523	TBALBOA 13A	13.800	G1	8.2	-1.8	6.6	-6.6	0.9700	8.6	0.9778	10.9	1	6
SUBSYSTEM TOTALS				978.6	132.9	622.0	-314.5				1336.0		

SYST

AREA 7 [ACANAL ] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X	T	R	A	N	GENTAP	ZONE	AREA	SWING	
126		MIR13A		12.000	G1	8.6	0.0	5.0	0.0	1.0445	8.2	1.0000	13.5								2	7	
127		MIR13B		12.000	G2	8.6	0.0	5.0	0.0	1.0445	8.2	1.0000	13.5								2	7	
130		MIR13F		13.800	G5	10.7	5.7	8.0	0.0	1.0000	12.1	0.8818	27.7								2	7	
134		MAD6A		6.9000	G1	9.7	1.1	6.0	-6.0	1.0000	9.7	0.9931	13.0								2	7	
135		MAD6B		6.9000	G2	9.7	1.1	6.0	-6.0	1.0000	9.7	0.9931	13.0								2	7	
136		MAD6C		6.9000	G3	9.7	1.1	6.0	-6.0	1.0000	9.7	0.9931	13.0								2	7	
140		GAT6A		6.9000	G1	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9992	4.1								2	7	
140		GAT6A		6.9000	G2	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9992	4.1								2	7	
140		GAT6A		6.9000	G3	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9992	4.1								2	7	
141		GAT6B		6.9000	G4	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9859	5.6								2	7	
141		GAT6B		6.9000	G5	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9859	6.2								2	7	
141		GAT6B		6.9000	G6	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9859	6.2								2	7	
SUBSYSTEM TOTALS						74.3	7.4	51.0	-33.0				124.2										



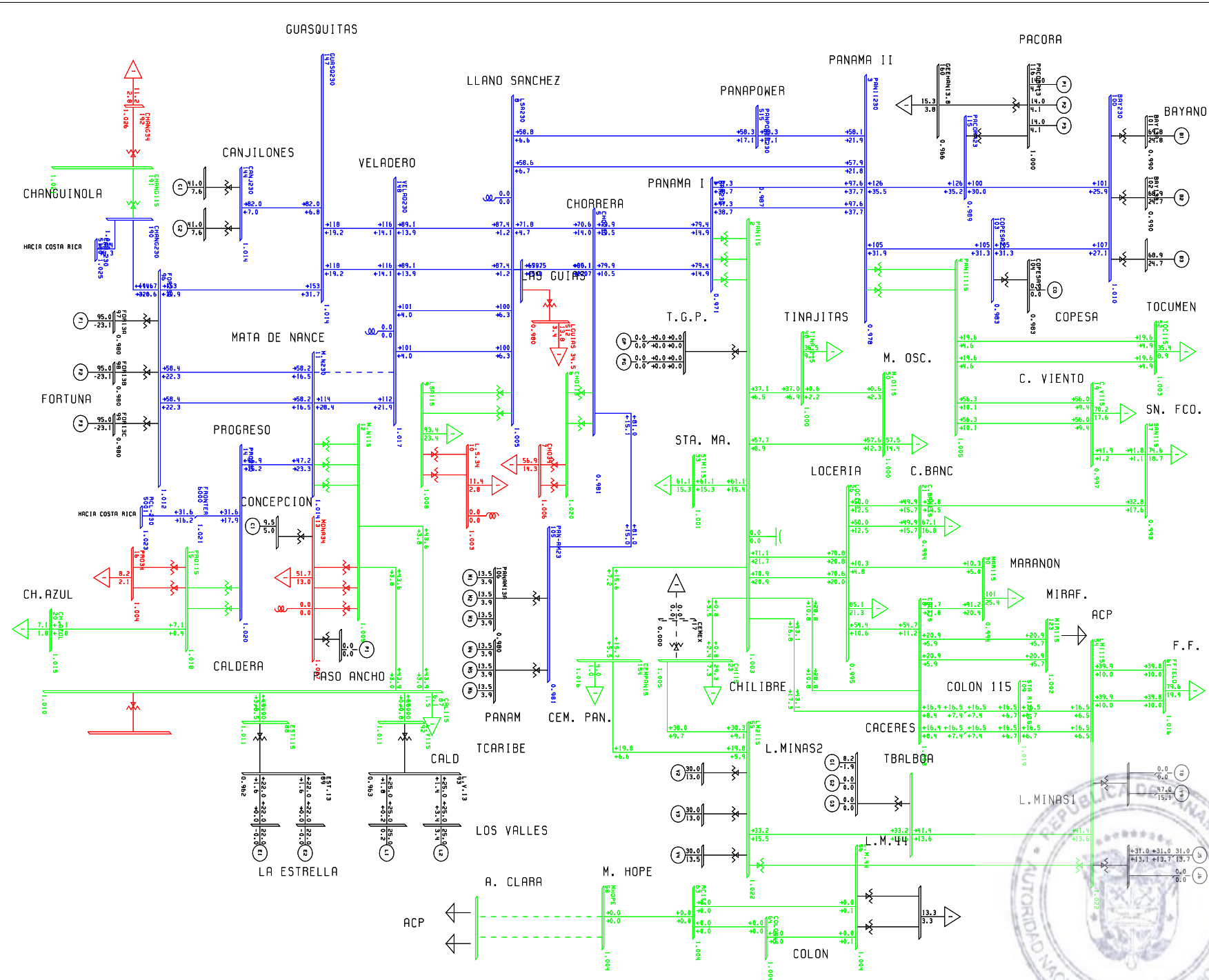
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**PLAN DE EXPANSION DEL SIN CON CENTROAMERICA JUNIO DEL 2008**  
**AÑO 2008 ESCENARIO MODERADO DEMANDA MAXIMA INVIERNO**  
**Contingencia 3: Mata de Nance - Veladero**



*de*





### Contingencia 3: Mata de Nance - Veladero

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E THU, DEC 27 2007 10:05  
P. EXP-SIN CON C.A. JUNIO 2008 ESC MOD DEM MAX INV  
AÑO 2008 ESTUDIOS BASICOS CNT3 MATA DE NANCE - VELADERO

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
8		LSA230		230.00	6	1.0045	231.04	11		M.N230		230.00	6	1.0142	233.28
14		PRO230		230.00	6	1.0199	234.57	96		FOR230		230.00	6	1.0115	232.65
100		BAY230		230.00	6	1.0104	232.38	144		CANJ230		230.00	6	1.0139	233.19
147		GUASQ230		230.00	6	1.0138	233.18	148		VELAD230		230.00	6	1.0168	233.86
190		CHANG230		230.00	6	1.0250	235.76	6000		FRONTER		230.00	6	1.0209	234.82

BUSES WITH VOLTAGE LESS THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
1		PAN230		230.00	6	0.9708	223.29	3		PANII230		230.00	6	0.9784	225.03
5		CHO230		230.00	6	0.9809	225.62	103		COPESA23		230.00	6	0.9835	226.20
105		PAN-AM23		230.00	6	0.9810	225.64	115		PACORA23		230.00	6	0.9891	227.49
511		LGUIAS230		230.00	6	0.9955	228.96	515		PANPOWER230		230.00	6	0.9867	226.95

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E THU, DEC 27 2007 10:05  
P. EXP-SIN CON C.A. JUNIO 2008 ESC MOD DEM MAX INV  
AÑO 2008 ESTUDIOS BASICOS CNT3 MATA DE NANCE - VELADERO

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2		PAN115		115.00	6	1.0030	115.35	4		PANII115		115.00	6	1.0053	115.61
6		CHO115		115.00	6	1.0197	117.26	9		LSA115		115.00	6	1.0081	115.93
12		M.N115		115.00	6	1.0054	115.62	15		PRO115		115.00	6	1.0181	117.09
18		CAC115		115.00	6	1.0026	115.29	20		CH.AZUL		115.00	6	1.0155	116.78
23		CH115		115.00	6	1.0053	115.61	33		STM115		115.00	6	1.0014	115.17
48		TINAJ115		115.00	6	1.0002	115.03	50		M.O115		115.00	6	1.0002	115.02
52		TOC115		115.00	6	1.0028	115.33	54		LM1115		115.00	6	1.0216	117.48
55		LM2115		115.00	6	1.0221	117.54	61		FFIELD		115.00	9	1.0159	116.83
87		CAL115		115.00	6	1.0101	116.16	88		EST115		115.00	6	1.0112	116.29
92		L.V115		115.00	6	1.0108	116.24	109		STA RITA115		115.00	6	1.0194	117.24
110		PTMD115A		115.00	6	1.0129	116.48	111		PTMD115B		115.00	6	1.0129	116.48
123		MIR115		115.00	7	1.0025	115.28	154		CEMPAN15		115.00	6	1.0163	116.87
191		CHANG115		115.00	6	1.0208	117.39	522		TBALBOA 115		115.00	6	1.0218	117.51

BUSES WITH VOLTAGE LESS THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
19		C.V115		115.00	6	0.9971	114.67	21		C.BAN115		115.00	6	0.9941	114.32
26		LOC115		115.00	6	0.9951	114.43	30		MAR115		115.00	6	0.9936	114.26
37		SAN115		115.00	6	0.9933	114.23								

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E THU, DEC 27 2007 10:05  
P. EXP-SIN CON C.A. JUNIO 2008 ESC MOD DEM MAX INV  
AÑO 2008 ESTUDIOS BASICOS CNT3 MATA DE NANCE - VELADERO

AREA 6 [PANAMA] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING	
66		BLM13B		13.800	V2	30.0	13.0	17.0	0.0	1.0000	32.7	0.9178	47.0					1	6



*Handwritten signature or initials.*

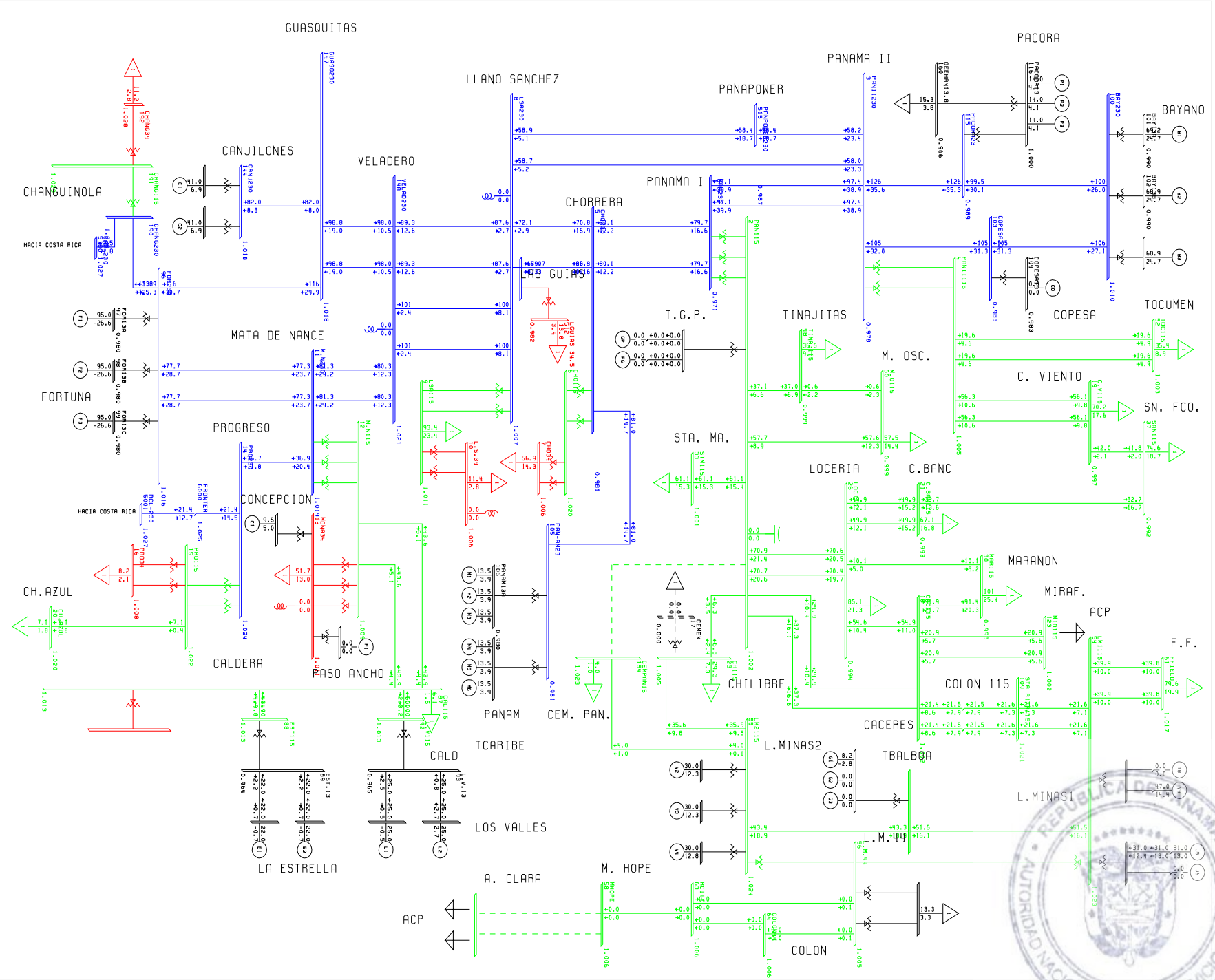
67	BLM13C	13.800	V3	30.0	13.0	17.0	0.0	1.0000	32.7	0.9178	47.0	1	6
68	BLM13D	13.800	V4	30.0	13.5	30.0	0.0	1.0000	32.9	0.9114	47.0	1	6
70	TGJB13A	13.800	J5	31.0	13.7	20.0	0.0	1.0000	33.9	0.9149	39.4	1	6
73	BLMCCB	13.800	V9	47.0	15.1	40.0	0.0	1.0000	49.4	0.9523	71.0	1	6
90	EST-13L	13.800	E1	22.0	0.0	12.0	-5.0	0.9600	22.9	1.0000	27.0	1	6
91	EST-13T	13.800	E2	22.0	0.0	12.0	-5.0	0.9600	22.9	1.0000	27.0	1	6
94	LV-13.8L	13.800	L1	25.0	0.2	12.0	-5.0	0.9600	26.0	1.0000	27.0	1	6
95	LV-13.8T	13.800	L2	25.0	3.4	12.0	-5.0	0.9700	26.0	0.9907	27.0	1	6
97	FOR13A	13.800	F1	95.0	-23.1	50.0	-50.0	0.9800	99.8	0.9717	111.0	1	6
98	FOR13B	13.800	F2	95.0	-23.1	50.0	-50.0	0.9800	99.8	0.9717	111.0	1	6
99	FOR13C	13.800	F3	95.0	-23.1	50.0	-50.0	0.9800	99.8	0.9717	111.0	1	6
101	BAY13A	13.800	B1	69.8	24.8	50.0	-25.0	0.9900	74.8	0.9425	96.0	1	6
102	BAY13B	13.800	B2	68.9	24.7	50.0	-25.0	0.9900	73.9	0.9414	96.0	1	6
106	PANAM13A	13.800	M1	13.5	3.9	9.0	0.0	0.9800	14.3	0.9603	20.7	1	6
106	PANAM13A	13.800	M2	13.5	3.9	9.0	0.0	0.9800	14.3	0.9603	20.7	1	6
106	PANAM13A	13.800	M3	13.5	3.9	9.0	0.0	0.9800	14.3	0.9603	20.7	1	6
107	PANAM13B	13.800	M4	13.5	3.9	9.0	0.0	0.9800	14.3	0.9603	20.7	1	6
107	PANAM13B	13.800	M5	13.5	3.9	9.0	0.0	0.9800	14.3	0.9603	20.7	1	6
107	PANAM13B	13.800	M6	13.5	3.9	9.0	0.0	0.9800	14.3	0.9603	20.7	1	6
108	BAY13C	13.800	B3	68.9	24.7	50.0	-25.0	0.9900	73.9	0.9414	100.0	1	6
116	PACORA13	13.800	P1	14.0	4.1	8.8	0.0	1.0000	14.6	0.9598	21.7	1	6
116	PACORA13	13.800	P2	14.0	4.1	8.8	0.0	1.0000	14.6	0.9598	21.7	1	6
116	PACORA13	13.800	P3	14.0	4.1	8.8	0.0	1.0000	14.6	0.9598	21.7	1	6
142	CANJ13A	13.800	C1	41.0	7.6	29.0	-29.0	0.9783	42.6	0.9834	69.0	1	6
143	CANJ13B	13.800	C2	41.0	7.6	29.0	-29.0	0.9783	42.6	0.9834	69.0	1	6
301	CONC13.8	13.800	C1	9.5	5.0	5.0	-5.0	0.9623	11.2	0.8849	13.5	1	6
523	TBALBOA 13A	13.800	G1	8.2	-1.9	6.6	-6.6	0.9700	8.7	0.9750	10.9	1	6
SUBSYSTEM TOTALS				977.3	130.8	622.0	-314.5				1336.0		

AREA 7 [ACANAL ] MACHINE SUMMARY:																			
BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING	
126		MIR13A		12.000	G1	8.6	0.0	5.0	0.0	1.0447	8.2	1.0000	13.5			2	7		
127		MIR13B		12.000	G2	8.6	0.0	5.0	0.0	1.0447	8.2	1.0000	13.5			2	7		
130		MIR13F		13.800	G5	10.7	5.6	8.0	0.0	1.0000	12.1	0.8849	27.7			2	7		
134		MAD6A		6.9000	G1	9.7	1.1	6.0	-6.0	1.0000	9.7	0.9932	13.0			2	7		
135		MAD6B		6.9000	G2	9.7	1.1	6.0	-6.0	1.0000	9.7	0.9933	13.0			2	7		
136		MAD6C		6.9000	G3	9.7	1.1	6.0	-6.0	1.0000	9.7	0.9933	13.0			2	7		
140		GAT6A		6.9000	G1	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9993	4.1			2	7		
140		GAT6A		6.9000	G2	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9993	4.1			2	7		
140		GAT6A		6.9000	G3	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9993	4.1			2	7		
141		GAT6B		6.9000	G4	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9858	5.6			2	7		
141		GAT6B		6.9000	G5	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9858	6.2			2	7		
141		GAT6B		6.9000	G6	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9858	6.2			2	7		
SUBSYSTEM TOTALS						74.3	7.3	51.0	-33.0				124.2						

**PLAN DE EXPANSION DEL SIN CON CENTROAMERICA JUNIO DEL 2008  
AÑO 2008 ESCENARIO MODERADO DEMANDA MAXIMA INVIERNO  
Contingencia 4: Panamá - Cemento Panamá**



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## Contingencia 4: Panamá – Cemento Panamá

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E THU, DEC 27 2007 8:40  
 P. EXP-SIN CON C.A. JUNIO 2008 ESC MOD DEM MAX INV  
 Año 2008 ESTUDIOS BASICOS CNT4 PMá-CEM PMá

### BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
8		LSA230		230.00	6	1.0074	231.69	11		M.N230		230.00	6	1.0193	234.43
14		PRO230		230.00	6	1.0242	235.57	96		FOR230		230.00	6	1.0155	233.57
100		BAY230		230.00	6	1.0104	232.38	144		CANJ230		230.00	6	1.0183	234.20
147		GUASQ230		230.00	6	1.0183	234.20	148		VELAD230		230.00	6	1.0213	234.91
190		CHANG230		230.00	6	1.0276	236.34	6000		FRONTER		230.00	6	1.0251	235.78

### BUSES WITH VOLTAGE LESS THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
1		PAN230		230.00	6	0.9706	223.25	3		PANII230		230.00	6	0.9784	225.02
5		CHO230		230.00	6	0.9814	225.72	103		COPESA23		230.00	6	0.9835	226.20
105		PAN-AM23		230.00	6	0.9815	225.74	115		PACORA23		230.00	6	0.9891	227.48
511		LGUIAS230		230.00	6	0.9974	229.39	515		PANPOWER230		230.00	6	0.9872	227.06

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 PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E THU, DEC 27 2007 8:41  
 P. EXP-SIN CON C.A. JUNIO 2008 MHT7H ESC MOD DEM MAX INV  
 Año 2008 ESTUDIOS BASICOS CNT4 PMá-CEM PMá

### BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2		PAN115		115.00	6	1.0021	115.24	4		PANII115		115.00	6	1.0050	115.58
6		CHO115		115.00	6	1.0202	117.32	9		LSA115		115.00	6	1.0111	116.28
12		M.N115		115.00	6	1.0092	116.06	15		PRO115		115.00	6	1.0225	117.59
18		CAC115		115.00	6	1.0017	115.20	20		CH.AZUL		115.00	6	1.0198	117.28
23		CH115		115.00	6	1.0054	115.62	33		STM115		115.00	6	1.0005	115.06
52		TOC115		115.00	6	1.0026	115.30	54		LM115		115.00	6	1.0231	117.65
55		LM2115		115.00	6	1.0237	117.72	61		FFIELD		115.00	9	1.0174	117.00
87		CAL115		115.00	6	1.0127	116.45	88		EST115		115.00	6	1.0135	116.55
92		L.V115		115.00	6	1.0132	116.52	109		STA RITA115		115.00	6	1.0206	117.37
110		PTMD115A		115.00	6	1.0132	116.52	111		PTMD115B		115.00	6	1.0132	116.52
123		MIR115		115.00	7	1.0016	115.19	154		CEMPAN15		115.00	6	1.0229	117.63
191		CHANG115		115.00	6	1.0233	117.68	522		TBALBOA	115	115.00	6	1.0234	117.69

### BUSES WITH VOLTAGE LESS THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
19		C.V115		115.00	6	0.9967	114.62	21		C.BAN115		115.00	6	0.9933	114.23
26		LOC115		115.00	6	0.9942	114.34	30		MAR115		115.00	6	0.9927	114.16
37		SAN115		115.00	6	0.9925	114.14	48		TINAJ115		115.00	6	0.9993	114.92
50		M.O115		115.00	6	0.9993	114.92								

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E THU, DEC 27 2007 8:41  
 P. EXP-SIN CON C.A. JUNIO 2008 ESC MOD DEM MAX INV  
 Año 2008 ESTUDIOS BASICOS CNT4 PMá-CEM PMá

### AREA 6 [PANAMA] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
66		BLM13B		13.800	V2	30.0	12.3	17.0	0.0	1.0000	32.4	0.9254	47.0			1	6	



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67	BLM13C	13.800	V3	30.0	12.3	17.0	0.0	1.0000	32.4	0.9254	47.0	1	6
68	BLM13D	13.800	V4	30.0	12.8	30.0	0.0	1.0000	32.6	0.9195	47.0	1	6
70	TGJB13A	13.800	J5	31.0	13.0	20.0	0.0	1.0000	33.6	0.9220	39.4	1	6
73	BLMCCB	13.800	V9	47.0	14.4	40.0	0.0	1.0000	49.2	0.9561	71.0	1	6
90	EST-13L	13.800	E1	22.0	-0.7	12.0	-5.0	0.9600	22.9	0.9995	27.0	1	6
91	EST-13T	13.800	E2	22.0	-0.7	12.0	-5.0	0.9600	22.9	0.9995	27.0	1	6
94	LV-13.8L	13.800	L1	25.0	-0.5	12.0	-5.0	0.9600	26.0	0.9998	27.0	1	6
95	LV-13.8T	13.800	L2	25.0	2.7	12.0	-5.0	0.9700	25.9	0.9940	27.0	1	6
97	FOR13A	13.800	F1	95.0	-26.6	50.0	-50.0	0.9800	100.7	0.9628	111.0	1	6
98	FOR13B	13.800	F2	95.0	-26.6	50.0	-50.0	0.9800	100.7	0.9628	111.0	1	6
99	FOR13C	13.800	F3	95.0	-26.6	50.0	-50.0	0.9800	100.7	0.9628	111.0	1	6
101	BAY13A	13.800	B1	69.2	24.7	50.0	-25.0	0.9900	74.2	0.9417	96.0	1	6
102	BAY13B	13.800	B2	68.9	24.7	50.0	-25.0	0.9900	73.9	0.9413	96.0	1	6
106	PANAM13A	13.800	M1	13.5	3.9	9.0	0.0	0.9800	14.3	0.9615	20.7	1	6
106	PANAM13A	13.800	M2	13.5	3.9	9.0	0.0	0.9800	14.3	0.9615	20.7	1	6
106	PANAM13A	13.800	M3	13.5	3.9	9.0	0.0	0.9800	14.3	0.9615	20.7	1	6
107	PANAM13B	13.800	M4	13.5	3.9	9.0	0.0	0.9800	14.3	0.9615	20.7	1	6
107	PANAM13B	13.800	M5	13.5	3.9	9.0	0.0	0.9800	14.3	0.9615	20.7	1	6
107	PANAM13B	13.800	M6	13.5	3.9	9.0	0.0	0.9800	14.3	0.9615	20.7	1	6
108	BAY13C	13.800	B3	68.9	24.7	50.0	-25.0	0.9900	73.9	0.9413	100.0	1	6
116	PACORA13	13.800	P1	14.0	4.1	8.8	0.0	1.0000	14.6	0.9597	21.7	1	6
116	PACORA13	13.800	P2	14.0	4.1	8.8	0.0	1.0000	14.6	0.9597	21.7	1	6
116	PACORA13	13.800	P3	14.0	4.1	8.8	0.0	1.0000	14.6	0.9597	21.7	1	6
142	CANJ13A	13.800	C1	41.0	6.9	29.0	-29.0	0.9783	42.5	0.9863	69.0	1	6
143	CANJ13B	13.800	C2	41.0	6.9	29.0	-29.0	0.9783	42.5	0.9863	69.0	1	6
301	CONC13.8	13.800	C1	9.5	5.0	5.0	-5.0	0.9660	11.1	0.8849	13.5	1	6
523	TBALBOA 13A	13.800	G1	8.2	-2.8	6.6	-6.6	0.9700	8.9	0.9481	10.9	1	6
SUBSYSTEM TOTALS				976.6	111.3	622.0	-314.5				1336.0		

SYST

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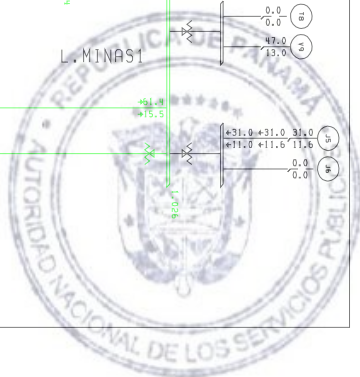
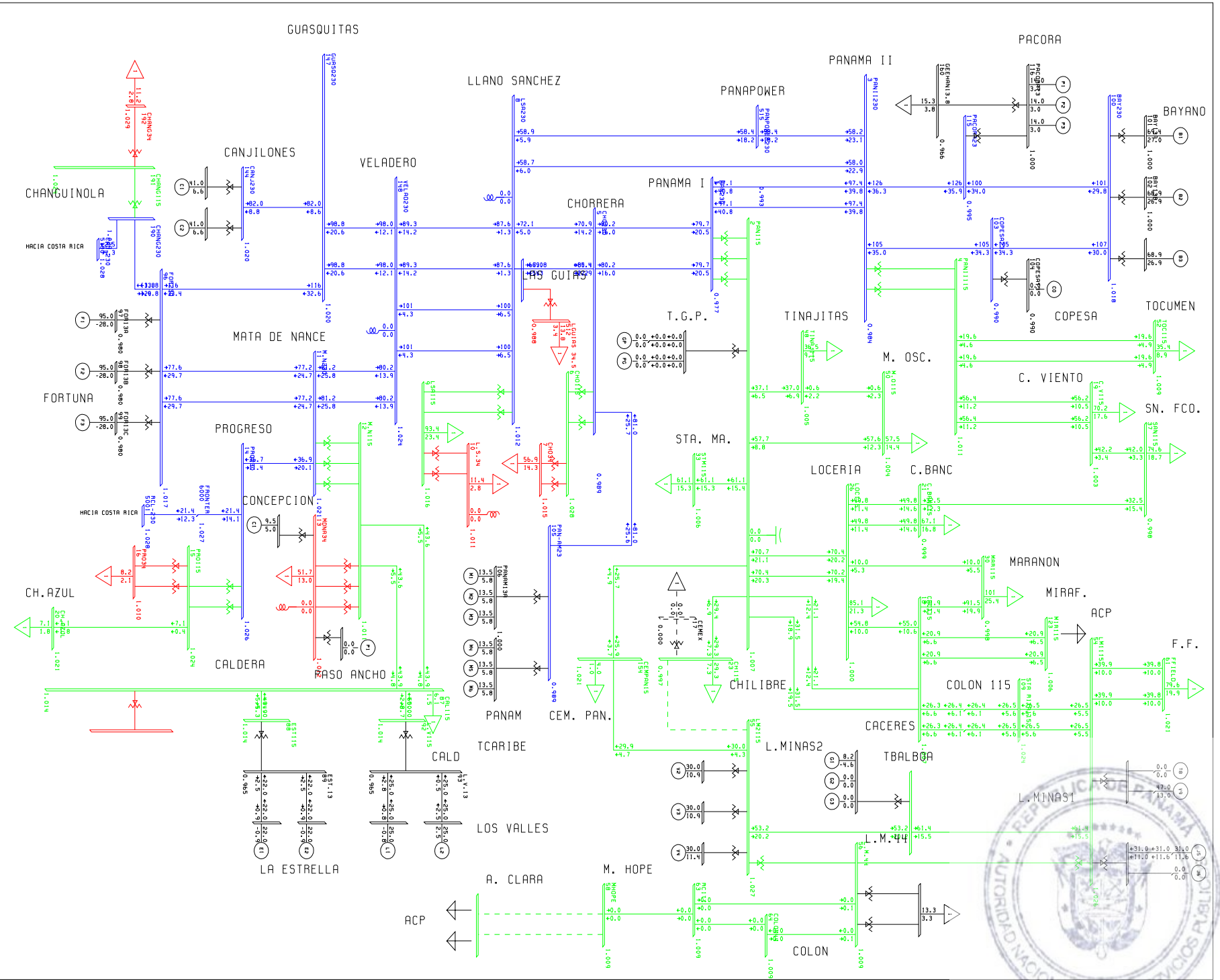
AREA 7 [ACANAL ] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
126		MIR13A		12.000	G1	8.6	0.0	5.0	0.0	1.0442	8.2	1.0000	13.5			2	7	
127		MIR13B		12.000	G2	8.6	0.0	5.0	0.0	1.0443	8.2	1.0000	13.5			2	7	
130		MIR13F		13.800	G5	10.7	5.8	8.0	0.0	1.0000	12.2	0.8785	27.7			2	7	
134		MAD6A		6.9000	G1	9.7	1.2	6.0	-6.0	1.0000	9.7	0.9929	13.0			2	7	
135		MAD6B		6.9000	G2	9.7	1.2	6.0	-6.0	1.0000	9.7	0.9930	13.0			2	7	
136		MAD6C		6.9000	G3	9.7	1.2	6.0	-6.0	1.0000	9.7	0.9930	13.0			2	7	
140		GAT6A		6.9000	G1	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9991	4.1			2	7	
140		GAT6A		6.9000	G2	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9991	4.1			2	7	
140		GAT6A		6.9000	G3	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9991	4.1			2	7	
141		GAT6B		6.9000	G4	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9860	5.6			2	7	
141		GAT6B		6.9000	G5	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9860	6.2			2	7	
141		GAT6B		6.9000	G6	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9860	6.2			2	7	
SUBSYSTEM TOTALS						74.3	7.6	51.0	-33.0				124.2					

**PLAN DE EXPANSION DEL SIN CON CENTROAMERICA JUNIO DEL 2008**  
**AÑO 2008 ESCENARIO MODERADO DEMANDA MAXIMA INVIERNO**  
**Contingencia 5: Minas 2 - Chilibre**



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## Contingencia 5: Minas 2 - Chilibre

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E THU, DEC 27 2007 9:39  
 P. EXP-SIN CON C.A. JUNIO 2008 ESC MOD DEM MAX INV  
 AÑO 2008 ESTUDIOS BASICOS CNT5 MINAS 2 - CHILIBRE

### BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
8	LSA230	230.00	6	1.0122	232.80		
14	PRO230	230.00	6	1.0258	235.94		
100	BAY230	230.00	6	1.0181	234.15		
147	GUASQ230	230.00	6	1.0201	234.62		
190	CHANG230	230.00	6	1.0285	236.56		
6000	FRONTER	230.00	6	1.0267	236.14		

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
11	M.N230	230.00	6	1.0210	234.84		
96	FOR230	230.00	6	1.0170	233.91		
144	CANJ230	230.00	6	1.0201	234.63		
148	VELAD230	230.00	6	1.0243	235.60		
511	LGUIAS230	230.00	6	1.0033	230.75		

### BUSES WITH VOLTAGE LESS THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
1	PAN230	230.00	6	0.9767	224.64		
5	CHO230	230.00	6	0.9887	227.41		
105	PAN-AM23	230.00	6	0.9889	227.44		
515	PANPOWER230	230.00	6	0.9931	228.42		

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
3	PANII230	230.00	6	0.9845	226.43		
103	COPESA23	230.00	6	0.9898	227.66		
115	PACORA23	230.00	6	0.9952	228.90		

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E THU, DEC 27 2007 9:40  
 P. EXP-SIN CON C.A. JUNIO 2008 MHT7H ESC MOD DEM MAX INV  
 AÑO 2008 ESTUDIOS BASICOS CNT5 MINAS 2 - CHILIBRE

### BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2	PAN115	115.00	6	1.0073	115.84		
6	CHO115	115.00	6	1.0281	118.23		
12	M.N115	115.00	6	1.0106	116.21		
18	CAC115	115.00	6	1.0068	115.79		
20	CH.AZUL	115.00	6	1.0214	117.47		
48	TINAJ115	115.00	6	1.0045	115.52		
52	TOC115	115.00	6	1.0087	116.00		
55	LM2115	115.00	6	1.0270	118.10		
87	CAL115	115.00	6	1.0135	116.56		
92	L.V115	115.00	6	1.0141	116.62		
110	PTMD115A	115.00	6	1.0174	117.00		
123	MIR115	115.00	7	1.0065	115.75		
191	CHANG115	115.00	6	1.0243	117.79		

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	
4	PANII115	115.00	6	1.0111	116.28			
9	LSA115	115.00	6	1.0162	116.86			
15	PRO115	115.00	6	1.0241	117.77			
19	C.V115	115.00	6	1.0025	115.29			
33	STM115	115.00	6	1.0057	115.66			
50	M.O115	115.00	6	1.0045	115.51			
54	LM1115	115.00	6	1.0262	118.02			
61	FFIELD	115.00	9	1.0206	117.37			
88	EST115	115.00	6	1.0143	116.64			
109	STA RITA115	115.00	6	1.0239	117.75			
111	PTMD115B	115.00	6	1.0174	117.00			
154	CEMPAN15	115.00	6	1.0208	117.40			
522	TBALBOA	115	115.00	6	1.0266	118.06		

### BUSES WITH VOLTAGE LESS THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
21	C.BAN115	115.00	6	0.9986	114.84		
26	LOC115	115.00	6	0.9995	114.94		
37	SAN115	115.00	6	0.9979	114.76		

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
23	CH115	115.00	6	0.9970	114.66		
30	MAR115	115.00	6	0.9980	114.76		

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E THU, DEC 27 2007 9:40  
 P. EXP-SIN CON C.A. JUNIO 2008 MHT7H ESC MOD DEM MAX INV  
 AÑO 2008 ESTUDIOS BASICOS CNT5 MINAS 2 - CHILIBRE

### AREA 6 [PANAMA] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING	
66	BLM13B			13.800	V2	30.0	10.9	17.0	0.0	1.0000	31.9	0.9400	47.0					1	6



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67	BLM13C	13.800	V3	30.0	10.9	17.0	0.0	1.0000	31.9	0.9400	47.0	1	6
68	BLM13D	13.800	V4	30.0	11.4	30.0	0.0	1.0000	32.1	0.9353	47.0	1	6
70	TGJB13A	13.800	J5	31.0	11.6	20.0	0.0	1.0000	33.1	0.9364	39.4	1	6
73	BLMCCB	13.800	V9	47.0	13.0	40.0	0.0	1.0000	48.8	0.9639	71.0	1	6
90	EST-13L	13.800	E1	22.0	-0.9	12.0	-5.0	0.9600	22.9	0.9992	27.0	1	6
91	EST-13T	13.800	E2	22.0	-0.9	12.0	-5.0	0.9600	22.9	0.9992	27.0	1	6
94	LV-13.8L	13.800	L1	25.0	-0.8	12.0	-5.0	0.9600	26.1	0.9995	27.0	1	6
95	LV-13.8T	13.800	L2	25.0	2.5	12.0	-5.0	0.9700	25.9	0.9950	27.0	1	6
97	FOR13A	13.800	F1	95.0	-28.0	50.0	-50.0	0.9800	101.0	0.9593	111.0	1	6
98	FOR13B	13.800	F2	95.0	-28.0	50.0	-50.0	0.9800	101.0	0.9593	111.0	1	6
99	FOR13C	13.800	F3	95.0	-28.0	50.0	-50.0	0.9800	101.0	0.9593	111.0	1	6
101	BAY13A	13.800	B1	69.4	27.0	50.0	-25.0	1.0000	74.4	0.9319	96.0	1	6
102	BAY13B	13.800	B2	68.9	26.9	50.0	-25.0	1.0000	73.9	0.9313	96.0	1	6
106	PANAM13A	13.800	M1	13.5	5.8	9.0	0.0	1.0000	14.7	0.9198	20.7	1	6
106	PANAM13A	13.800	M2	13.5	5.8	9.0	0.0	1.0000	14.7	0.9198	20.7	1	6
106	PANAM13A	13.800	M3	13.5	5.8	9.0	0.0	1.0000	14.7	0.9198	20.7	1	6
107	PANAM13B	13.800	M4	13.5	5.8	9.0	0.0	1.0000	14.7	0.9198	20.7	1	6
107	PANAM13B	13.800	M5	13.5	5.8	9.0	0.0	1.0000	14.7	0.9198	20.7	1	6
107	PANAM13B	13.800	M6	13.5	5.8	9.0	0.0	1.0000	14.7	0.9198	20.7	1	6
108	BAY13C	13.800	B3	68.9	26.9	50.0	-25.0	1.0000	73.9	0.9313	100.0	1	6
116	PACORA13	13.800	P1	14.0	3.0	8.8	0.0	1.0000	14.3	0.9780	21.7	1	6
116	PACORA13	13.800	P2	14.0	3.0	8.8	0.0	1.0000	14.3	0.9780	21.7	1	6
116	PACORA13	13.800	P3	14.0	3.0	8.8	0.0	1.0000	14.3	0.9780	21.7	1	6
142	CANJ13A	13.800	C1	41.0	6.6	29.0	-29.0	0.9783	42.4	0.9874	69.0	1	6
143	CANJ13B	13.800	C2	41.0	6.6	29.0	-29.0	0.9783	42.4	0.9874	69.0	1	6
301	CONC13.8	13.800	C1	9.5	5.0	5.0	-5.0	0.9673	11.1	0.8849	13.5	1	6
523	TBALBOA 13A	13.800	G1	8.2	-4.6	6.6	-6.6	0.9700	9.7	0.8724	10.9	1	6
SUBSYSTEM TOTALS				976.8	111.7	622.0	-314.5				1336.0		

SYST

AREA 7 [ACANAL ] MACHINE SUMMARY:																							
BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X	T	R	A	N	GENTAP	ZONE	AREA	SWING	
126		MIR13A		12.000	G1	8.6	0.0	5.0	0.0	1.0468	8.2	1.0000	13.5								2	7	
127		MIR13B		12.000	G2	8.6	0.0	5.0	0.0	1.0468	8.2	1.0000	13.5								2	7	
130		MIR13F		13.800	G5	10.7	4.7	8.0	0.0	1.0000	11.7	0.9155	27.7								2	7	
134		MAD6A		6.9000	G1	9.7	1.0	6.0	-6.0	1.0000	9.7	0.9945	13.0								2	7	
135		MAD6B		6.9000	G2	9.7	1.0	6.0	-6.0	1.0000	9.7	0.9946	13.0								2	7	
136		MAD6C		6.9000	G3	9.7	1.0	6.0	-6.0	1.0000	9.7	0.9946	13.0								2	7	
140		GAT6A		6.9000	G1	1.9	0.0	2.0	-2.0	1.0000	1.9	0.9998	4.1								2	7	
140		GAT6A		6.9000	G2	1.9	0.0	2.0	-2.0	1.0000	1.9	0.9998	4.1								2	7	
140		GAT6A		6.9000	G3	1.9	0.0	2.0	-2.0	1.0000	1.9	0.9998	4.1								2	7	
141		GAT6B		6.9000	G4	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9844	5.6								2	7	
141		GAT6B		6.9000	G5	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9844	6.2								2	7	
141		GAT6B		6.9000	G6	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9844	6.2								2	7	
SUBSYSTEM TOTALS						74.3	5.8	51.0	-33.0				124.2										



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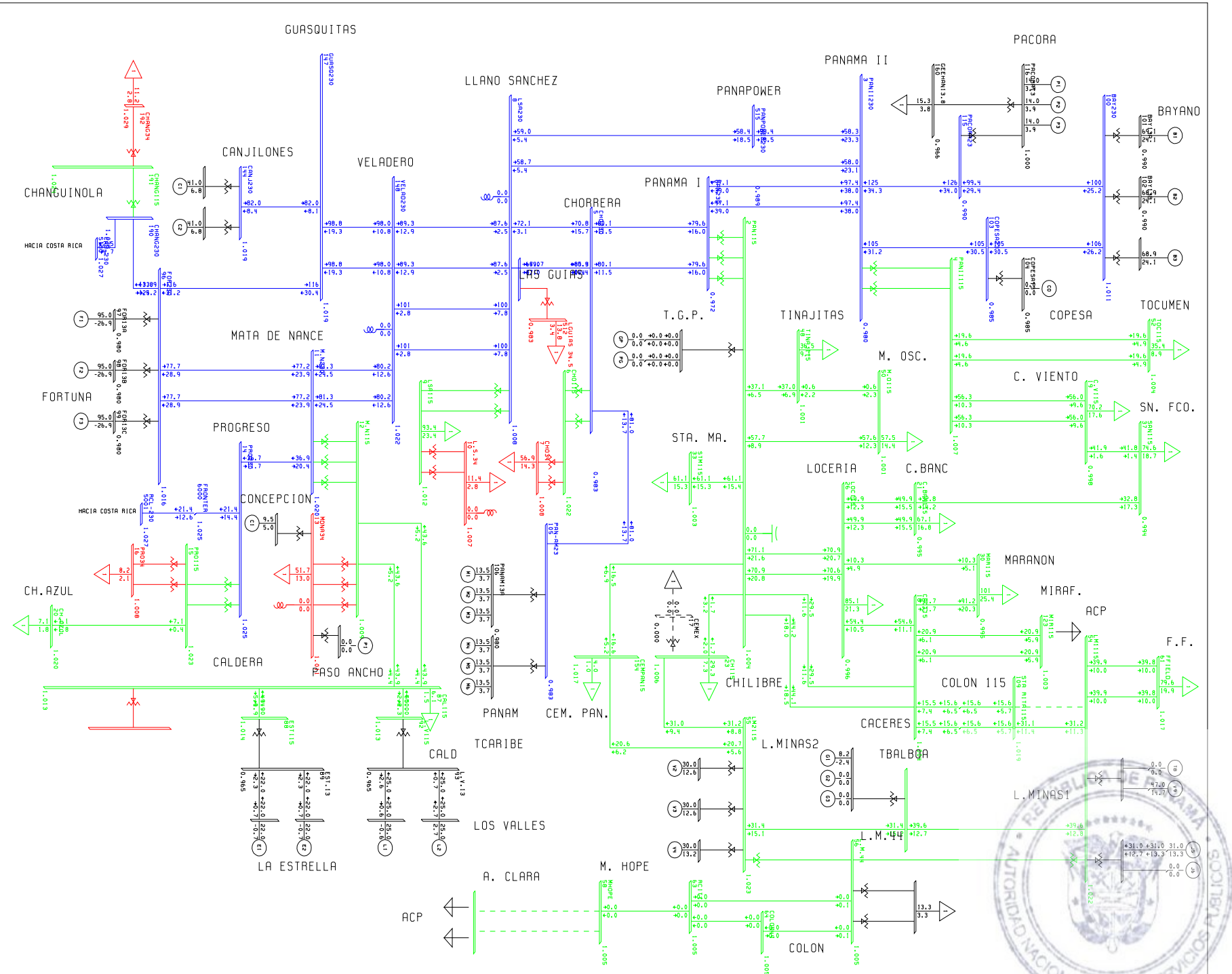
PLAN DE EXPANSION DEL SIN CON CENTROAMERICA JUNIO DEL 2008  
AÑO 2008 ESCENARIO MODERADO DEMANDA MAXIMA INVIERNO  
Contingencia 6: Minas 1 - Santa Rita



*de*

P. - EXP-SIN CON C.R. JUNIO 2008 ESC MOD DEM MAX INV  
 A O 2008 ESTUDIOS BASICOS CNT6 MINAS 1 - STA RITTA  
 THU, DEC 27 2007 13:16

BUS - VOLTAGE (PU)  
 BRANCH - MW/MVAR  
 EQUIPMENT - MW/MVAR



## Contingencia 6: Minas 1 – Santa Rita

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E THU, DEC 27 2007 10:31  
 P. EXP-SIN CON C.A. JUNIO 2008 ESC MOD DEM MAX INV  
 Año 2008 ESTUDIOS BASICOS CNT6 MINAS 1 - STA RITA

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
8	LSA230	230.00	6	1.0083	231.91	11	M.N230	230.00	6	1.0196	234.51				
14	PRO230	230.00	6	1.0245	235.64	96	FOR230	230.00	6	1.0158	233.63				
100	BAY230	230.00	6	1.0112	232.57	144	CANJ230	230.00	6	1.0186	234.29				
147	GUASQ230	230.00	6	1.0186	234.28	148	VELAD230	230.00	6	1.0219	235.04				
190	CHANG230	230.00	6	1.0278	236.38	6000	FRONTER	230.00	6	1.0254	235.85				

BUSES WITH VOLTAGE LESS THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
1	PAN230	230.00	6	0.9722	223.60	3	PANII230	230.00	6	0.9797	225.34				
5	CHO230	230.00	6	0.9827	226.01	103	COPESA23	230.00	6	0.9848	226.50				
105	PAN-AM23	230.00	6	0.9827	226.03	115	PACORA23	230.00	6	0.9902	227.75				
511	LGUIAS230	230.00	6	0.9984	229.64	515	PANPOWER230	230.00	6	0.9885	227.36				

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E THU, DEC 27 2007 10:31  
 P. EXP-SIN CON C.A. JUNIO 2008 ESC MOD DEM MAX INV  
 Año 2008 ESTUDIOS BASICOS CNT6 MINAS 1 - STA RITA

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2	PAN115	115.00	6	1.0041	115.47	4	PANII115	115.00	6	1.0066	115.76				
6	CHO115	115.00	6	1.0215	117.47	9	LSA115	115.00	6	1.0121	116.39				
12	M.N115	115.00	6	1.0095	116.09	15	PRO115	115.00	6	1.0228	117.62				
18	CAC115	115.00	6	1.0036	115.42	20	CH.AZUL	115.00	6	1.0201	117.32				
23	CH115	115.00	6	1.0063	115.73	33	STM115	115.00	6	1.0025	115.29				
48	TINAJ115	115.00	6	1.0013	115.15	50	M.O115	115.00	6	1.0013	115.15				
52	TOC115	115.00	6	1.0042	115.48	54	LM1115	115.00	6	1.0224	117.58				
55	LM2115	115.00	6	1.0229	117.64	61	FFIELD	115.00	9	1.0168	116.93				
87	CAL115	115.00	6	1.0128	116.47	88	EST115	115.00	6	1.0137	116.57				
92	L.V115	115.00	6	1.0134	116.54	109	STA RITA115	115.00	6	1.0187	117.15				
110	PTMD115A	115.00	6	1.0129	116.48	111	PTMD115B	115.00	6	1.0129	116.48				
123	MIR115	115.00	7	1.0035	115.40	154	CEMPAN15	115.00	6	1.0172	116.98				
191	CHANG115	115.00	6	1.0235	117.70	522	TBALBOA 115	115.00	6	1.0227	117.61				

BUSES WITH VOLTAGE LESS THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
19	C.V115	115.00	6	0.9984	114.81	21	C.BAN115	115.00	6	0.9953	114.46				
26	LOC115	115.00	6	0.9962	114.56	30	MAR115	115.00	6	0.9947	114.39				
37	SAN115	115.00	6	0.9944	114.36										



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PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E THU, DEC 27 2007 10:31  
P. EXP-SIN CON C.A. JUNIO 2008 ESC MOD DEM MAX INV  
AÑO 2008 ESTUDIOS BASICOS CNT6 MINAS 1 - STA RITA

AREA 6 [PANAMA ] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING	
66		BLM13B		13.800	V2	30.0	12.6	17.0	0.0	1.0000	32.5	0.9218	47.0			1	6		
67		BLM13C		13.800	V3	30.0	12.6	17.0	0.0	1.0000	32.5	0.9218	47.0			1	6		
68		BLM13D		13.800	V4	30.0	13.2	30.0	0.0	1.0000	32.8	0.9157	47.0			1	6		
70		TGJB13A		13.800	J5	31.0	13.3	20.0	0.0	1.0000	33.7	0.9191	39.4			1	6		
73		BLMCCB		13.800	V9	47.0	14.7	40.0	0.0	1.0000	49.2	0.9546	71.0			1	6		
90		EST-13L		13.800	E1	22.0	-0.7	12.0	-5.0	0.9600	22.9	0.9995	27.0			1	6		
91		EST-13T		13.800	E2	22.0	-0.7	12.0	-5.0	0.9600	22.9	0.9995	27.0			1	6		
94		LV-13.8L		13.800	L1	25.0	-0.6	12.0	-5.0	0.9600	26.0	0.9997	27.0			1	6		
95		LV-13.8T		13.800	L2	25.0	2.7	12.0	-5.0	0.9700	25.9	0.9942	27.0			1	6		
97		FOR13A		13.800	F1	95.0	-26.9	50.0	-50.0	0.9800	100.7	0.9622	111.0			1	6		
98		FOR13B		13.800	F2	95.0	-26.9	50.0	-50.0	0.9800	100.7	0.9622	111.0			1	6		
99		FOR13C		13.800	F3	95.0	-26.9	50.0	-50.0	0.9800	100.7	0.9622	111.0			1	6		
101		BAY13A		13.800	B1	69.1	24.1	50.0	-25.0	0.9900	73.9	0.9441	96.0			1	6	SYST	
102		BAY13B		13.800	B2	68.9	24.1	50.0	-25.0	0.9900	73.7	0.9439	96.0			1	6		
106		PANAM13A		13.800	M1	13.5	3.7	9.0	0.0	0.9800	14.3	0.9647	20.7			1	6		
106		PANAM13A		13.800	M2	13.5	3.7	9.0	0.0	0.9800	14.3	0.9647	20.7			1	6		
106		PANAM13A		13.800	M3	13.5	3.7	9.0	0.0	0.9800	14.3	0.9647	20.7			1	6		
107		PANAM13B		13.800	M4	13.5	3.7	9.0	0.0	0.9800	14.3	0.9647	20.7			1	6		
107		PANAM13B		13.800	M5	13.5	3.7	9.0	0.0	0.9800	14.3	0.9647	20.7			1	6		
107		PANAM13B		13.800	M6	13.5	3.7	9.0	0.0	0.9800	14.3	0.9647	20.7			1	6		
108		BAY13C		13.800	B3	68.9	24.1	50.0	-25.0	0.9900	73.7	0.9439	100.0			1	6		
116		PACORA13		13.800	P1	14.0	3.9	8.8	0.0	1.0000	14.5	0.9635	21.7			1	6		
116		PACORA13		13.800	P2	14.0	3.9	8.8	0.0	1.0000	14.5	0.9635	21.7			1	6		
116		PACORA13		13.800	P3	14.0	3.9	8.8	0.0	1.0000	14.5	0.9635	21.7			1	6		
142		CANJ13A		13.800	C1	41.0	6.8	29.0	-29.0	0.9783	42.5	0.9865	69.0			1	6		
143		CANJ13B		13.800	C2	41.0	6.8	29.0	-29.0	0.9783	42.5	0.9865	69.0			1	6		
301		CONC13.8		13.800	C1	9.5	5.0	5.0	-5.0	0.9663	11.1	0.8849	13.5			1	6		
523		TBALBOA 13A		13.800	G1	8.2	-2.4	6.6	-6.6	0.9700	8.8	0.9610	10.9			1	6		
SUBSYSTEM TOTALS						976.5	108.7	622.0	-314.5				1336.0						

AREA 7 [ACANAL ] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING	
126		MIR13A		12.000	G1	8.6	0.0	5.0	0.0	1.0452	8.2	1.0000	13.5			2	7		
127		MIR13B		12.000	G2	8.6	0.0	5.0	0.0	1.0452	8.2	1.0000	13.5			2	7		
130		MIR13F		13.800	G5	10.7	5.4	8.0	0.0	1.0000	12.0	0.8929	27.7			2	7		
134		MAD6A		6.9000	G1	9.7	1.1	6.0	-6.0	1.0000	9.7	0.9935	13.0			2	7		
135		MAD6B		6.9000	G2	9.7	1.1	6.0	-6.0	1.0000	9.7	0.9936	13.0			2	7		
136		MAD6C		6.9000	G3	9.7	1.1	6.0	-6.0	1.0000	9.7	0.9936	13.0			2	7		
140		GAT6A		6.9000	G1	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9994	4.1			2	7		
140		GAT6A		6.9000	G2	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9994	4.1			2	7		
140		GAT6A		6.9000	G3	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9994	4.1			2	7		
141		GAT6B		6.9000	G4	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9854	5.6			2	7		
141		GAT6B		6.9000	G5	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9854	6.2			2	7		
141		GAT6B		6.9000	G6	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9854	6.2			2	7		
SUBSYSTEM TOTALS						74.3	6.9	51.0	-33.0				124.2						

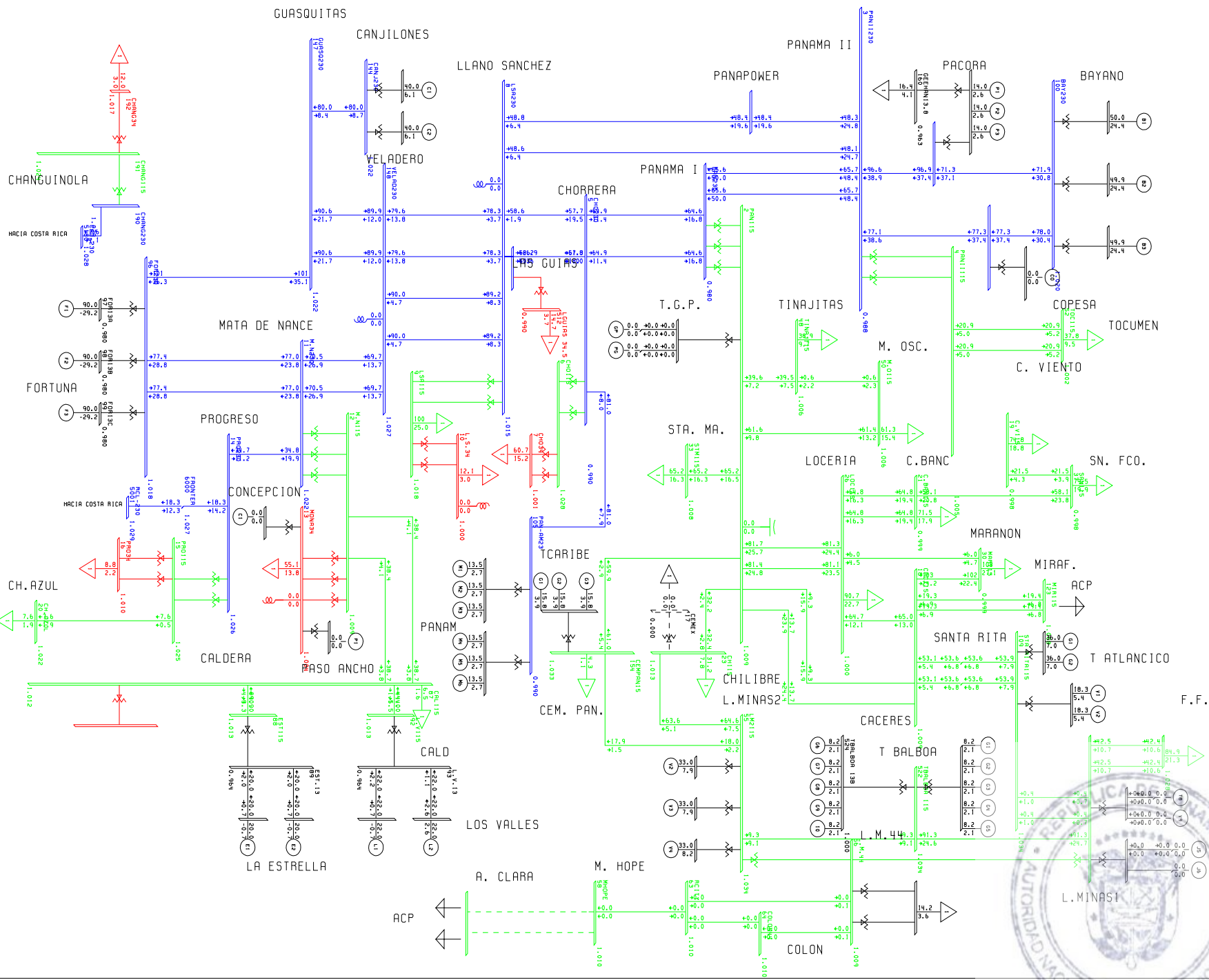


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**PLAN DE EXPANSION DEL SIN CON CENTROAMERICA JUNIO DEL 2008  
AÑO 2009 ESCENARIO MODERADO DEMANDA MAXIMA INVIERNO**



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PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
P. EXP-SIN CON C.A. JUNIO 2008 ESC MOD DEM MAX INV  
AÑO 2009 TBALBOA, TCARIBE Y TATLANTICO (EN STA RITA)

THU, DEC 27 2007 13:34

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
8		LSA230		230.00	6	1.0152	233.50	11		M.N230		230.00	6	1.0216	234.96
14		PRO230		230.00	6	1.0264	236.08	96		FOR230		230.00	6	1.0178	234.09
100		BAY230		230.00	6	1.0195	234.49	144		CANJ230		230.00	6	1.0215	234.95
147		GUASQ230		230.00	6	1.0215	234.95	148		VELAD230		230.00	6	1.0269	236.18
190		CHANG230		230.00	6	1.0288	236.62	511		LGUIAS230		230.00	6	1.0057	231.32
6000		FRONTER		230.00	6	1.0273	236.29								

BUSES WITH VOLTAGE LESS THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
1		PAN230		230.00	6	0.9803	225.48	3		PANII230		230.00	6	0.9884	227.33
5		CHO230		230.00	6	0.9898	227.66	103		COPESA23		230.00	6	0.9935	228.50
105		PAN-AM23		230.00	6	0.9899	227.68	115		PACORA23		230.00	6	0.9984	229.63
515		PANPOWER230		230.00	6	0.9972	229.35								

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
P. EXP-SIN CON C.A. JUNIO 2008 ESC MOD DEM MAX INV  
AÑO 2009 TBALBOA, TCARIBE Y TATLANTICO (EN STA RITA)

THU, DEC 27 2007 13:35

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2		PAN115		115.00	6	1.0093	116.07	4		PANII115		115.00	6	1.0045	115.52
6		CHO115		115.00	6	1.0280	118.22	9		LSA115		115.00	6	1.0177	117.04
12		M.N115		115.00	6	1.0091	116.04	15		PRO115		115.00	6	1.0245	117.82
18		CAC115		115.00	6	1.0089	116.02	20		CH.AZUL		115.00	6	1.0216	117.49
23		CH115		115.00	6	1.0130	116.49	26		LOC115		115.00	6	1.0001	115.01
33		STM115		115.00	6	1.0077	115.88	48		TINAJ115		115.00	6	1.0064	115.73
50		M.O115		115.00	6	1.0063	115.73	52		TOC115		115.00	6	1.0019	115.22
54		LM115		115.00	6	1.0338	118.88	55		LM2115		115.00	6	1.0344	118.96
61		FFIELD		115.00	9	1.0278	118.20	87		CAL115		115.00	6	1.0123	116.42
88		EST115		115.00	6	1.0131	116.51	92		L.V115		115.00	6	1.0129	116.48
109		STA RITA115		115.00	6	1.0336	118.87	110		PTMD115A		115.00	6	1.0239	117.75
111		PTMD115B		115.00	6	1.0239	117.75	123		MIR115		115.00	7	1.0083	115.95
154		CEMPAN15		115.00	6	1.0332	118.82	191		CHANG115		115.00	6	1.0242	117.78
522		TBALBOA	115	115.00	6	1.0343	118.95								

BUSES WITH VOLTAGE LESS THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
19		C.V115		115.00	6	0.9979	114.75	21		C.BAN115		115.00	6	0.9989	114.88
30		MAR115		115.00	6	0.9989	114.88	37		SAN115		115.00	6	0.9977	114.73



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AREA 6 [PANAMA ] MACHINE SUMMARY:																		
BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
66		BLM13B		13.800	V2	33.0	7.9	17.0	0.0	1.0000	33.9	0.9725	47.0			1	6	
67		BLM13C		13.800	V3	33.0	7.9	17.0	0.0	1.0000	33.9	0.9725	47.0			1	6	
68		BLM13D		13.800	V4	33.0	8.2	30.0	0.0	1.0000	34.0	0.9706	47.0			1	6	
90		EST-13L		13.800	E1	20.0	-0.7	12.0	-5.0	0.9600	20.8	0.9993	27.0			1	6	
91		EST-13T		13.800	E2	20.0	-0.7	12.0	-5.0	0.9600	20.8	0.9993	27.0			1	6	
94		LV-13.8L		13.800	L1	22.0	-0.7	12.0	-5.0	0.9600	22.9	0.9995	27.0			1	6	
95		LV-13.8T		13.800	L2	22.0	2.6	12.0	-5.0	0.9700	22.8	0.9931	27.0			1	6	
97		FOR13A		13.800	F1	90.0	-29.2	50.0	-50.0	0.9800	96.5	0.9512	111.0			1	6	
98		FOR13B		13.800	F2	90.0	-29.2	50.0	-50.0	0.9800	96.5	0.9512	111.0			1	6	
99		FOR13C		13.800	F3	90.0	-29.2	50.0	-50.0	0.9800	96.5	0.9512	111.0			1	6	
101		BAY13A		13.800	B1	50.0	24.4	50.0	-25.0	1.0000	55.6	0.8990	96.0			1	6	SYST
102		BAY13B		13.800	B2	49.9	24.4	50.0	-25.0	1.0000	55.6	0.8987	96.0			1	6	
106		PANAM13A		13.800	M1	13.5	2.7	9.0	0.0	0.9800	14.0	0.9808	20.7			1	6	
106		PANAM13A		13.800	M2	13.5	2.7	9.0	0.0	0.9800	14.0	0.9808	20.7			1	6	
106		PANAM13A		13.800	M3	13.5	2.7	9.0	0.0	0.9800	14.0	0.9808	20.7			1	6	
107		PANAM13B		13.800	M4	13.5	2.7	9.0	0.0	0.9800	14.0	0.9808	20.7			1	6	
107		PANAM13B		13.800	M5	13.5	2.7	9.0	0.0	0.9800	14.0	0.9808	20.7			1	6	
107		PANAM13B		13.800	M6	13.5	2.7	9.0	0.0	0.9800	14.0	0.9808	20.7			1	6	
108		BAY13C		13.800	B3	49.9	24.4	50.0	-25.0	1.0000	55.6	0.8987	100.0			1	6	
116		PACORA13		13.800	P1	14.0	2.6	8.8	0.0	1.0000	14.2	0.9835	21.7			1	6	
116		PACORA13		13.800	P2	14.0	2.6	8.8	0.0	1.0000	14.2	0.9835	21.7			1	6	
116		PACORA13		13.800	P3	14.0	2.6	8.8	0.0	1.0000	14.2	0.9835	21.7			1	6	
142		CANJ13A		13.800	C1	40.0	6.1	29.0	-29.0	0.9783	41.4	0.9886	69.0			1	6	
143		CANJ13B		13.800	C2	40.0	6.1	29.0	-29.0	0.9783	41.4	0.9886	69.0			1	6	
521		TCARIBE	13.8	13.800	G1	15.8	3.9	12.5	0.0	1.0000	16.3	0.9704	20.9			1	6	
521		TCARIBE	13.8	13.800	G2	15.8	3.9	12.5	0.0	1.0000	16.3	0.9704	20.9			1	6	
521		TCARIBE	13.8	13.800	G3	15.8	3.9	12.5	0.0	1.0000	16.3	0.9704	20.9			1	6	
523		TBALBOA	13A	13.800	G1	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9679	10.9			1	6	
523		TBALBOA	13A	13.800	G2	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9679	10.9			1	6	
523		TBALBOA	13A	13.800	G3	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9679	10.9			1	6	
523		TBALBOA	13A	13.800	G4	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9679	10.9			1	6	
523		TBALBOA	13A	13.800	G5	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9679	10.9			1	6	
524		TBALBOA	13B	13.800	10	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9679	10.9			1	6	
524		TBALBOA	13B	13.800	G6	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9679	10.9			1	6	
524		TBALBOA	13B	13.800	G7	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9679	10.9			1	6	
524		TBALBOA	13B	13.800	G8	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9679	10.9			1	6	
524		TBALBOA	13B	13.800	G9	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9679	10.9			1	6	
525		TATLANTIC13A13		13.800	G1	36.0	7.0	28.5	0.0	1.0000	36.7	0.9817	47.5			1	6	
525		TATLANTIC13A13		13.800	G2	36.0	7.0	28.5	0.0	1.0000	36.7	0.9817	47.5			1	6	
526		TATLANTIC13B13		13.800	V1	18.3	5.4	15.0	0.0	1.0000	19.1	0.9591	25.0			1	6	
526		TATLANTIC13B13		13.800	V2	18.3	5.4	15.0	0.0	1.0000	19.1	0.9591	25.0			1	6	
SUBSYSTEM TOTALS						1043.9	103.9	740.6	-368.6				1518.1					



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PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E THU, DEC 27 2007 13:34  
P. EXP-SIN CON C.A. JUNIO 2008 ESC MOD DEM MAX INV  
AÑO 2009 TBALBOA, TCARIBE Y TATLANTICO (EN STA RITA)

AREA 7 [ACANAL ] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
126		MIR13A		12.000	G1	8.6	0.0	5.0	0.0	1.0476	8.2	1.0000	13.5				2	7
127		MIR13B		12.000	G2	8.6	0.0	5.0	0.0	1.0476	8.2	1.0000	13.5				2	7
130		MIR13F		13.800	G5	9.7	4.3	8.0	0.0	1.0000	10.6	0.9130	27.7				2	7
134		MAD6A		6.9000	G1	9.7	1.0	6.0	-6.0	1.0000	9.7	0.9949	13.0				2	7
135		MAD6B		6.9000	G2	9.7	1.0	6.0	-6.0	1.0000	9.7	0.9950	13.0				2	7
136		MAD6C		6.9000	G3	9.7	1.0	6.0	-6.0	1.0000	9.7	0.9949	13.0				2	7
140		GAT6A		6.9000	G1	1.9	0.0	2.0	-2.0	1.0000	1.9	0.9998	4.1				2	7
140		GAT6A		6.9000	G2	1.9	0.0	2.0	-2.0	1.0000	1.9	0.9998	4.1				2	7
140		GAT6A		6.9000	G3	1.9	0.0	2.0	-2.0	1.0000	1.9	0.9998	4.1				2	7
141		GAT6B		6.9000	G4	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9843	5.6				2	7
141		GAT6B		6.9000	G5	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9843	6.2				2	7
141		GAT6B		6.9000	G6	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9843	6.2				2	7

SUBSYSTEM TOTALS

73.3 5.3 51.0 -33.0

124.2

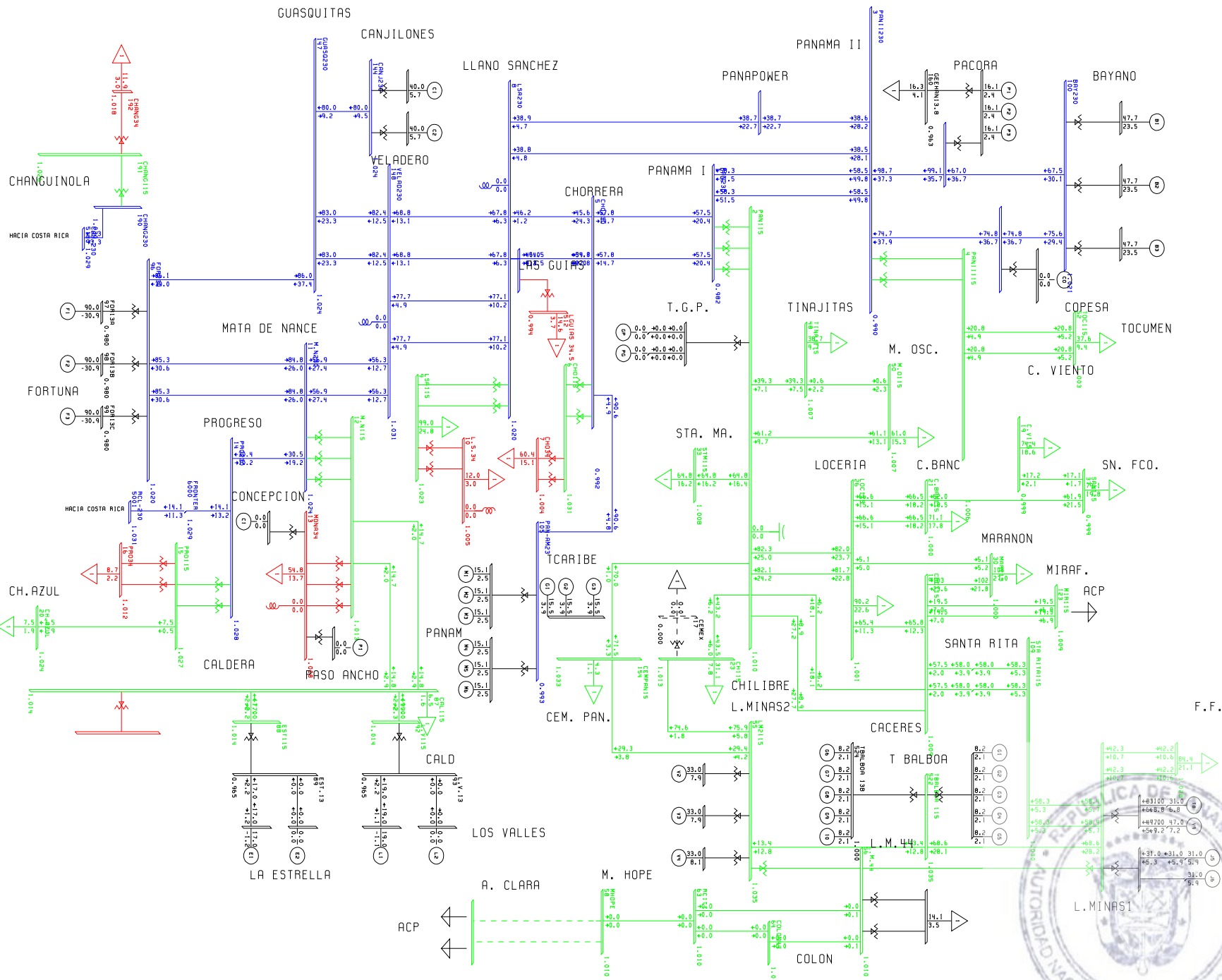


*Handwritten signature or initials.*

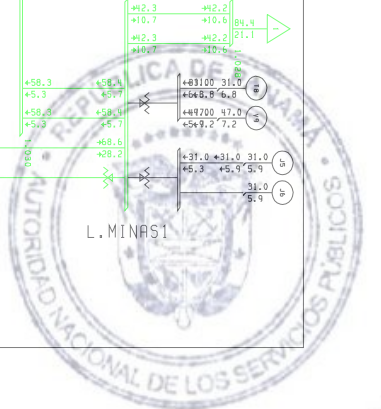
**PLAN DE EXPANSION DEL SIN CON CENTROAMERICA JUNIO DEL 2008  
AÑO 2009 ESCENARIO MODERADO DEMANDA MAXIMA VERANO**



*de*



F.F.



*Handwritten signature or initials*

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
8		LSA230		230.00	6	1.0197	234.54	11		M.N230		230.00	6	1.0237	235.45
14		PRO230		230.00	6	1.0285	236.55	96		FOR230		230.00	6	1.0198	234.54
100		BAY230		230.00	6	1.0205	234.72	115		PACORA23		230.00	6	1.0001	230.02
144		CANJ230		230.00	6	1.0241	235.54	147		GUASQ230		230.00	6	1.0241	235.54
148		VELAD230		230.00	6	1.0308	237.09	190		CHANG230		230.00	6	1.0300	236.91
511		LGUIAS230		230.00	6	1.0097	232.24	6000		FRONTER		230.00	6	1.0294	236.76

BUSES WITH VOLTAGE LESS THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
1		PAN230		230.00	6	0.9823	225.92	3		PANII230		230.00	6	0.9903	227.76
5		CHO230		230.00	6	0.9925	228.27	103		COPESA23		230.00	6	0.9953	228.91
105		PAN-AM23		230.00	6	0.9925	228.28	515		PANPOWER230		230.00	6	0.9998	229.94

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2		PAN115		115.00	6	1.0100	116.15	4		PANII115		115.00	6	1.0061	115.70
6		CHO115		115.00	6	1.0310	118.56	9		LSA115		115.00	6	1.0226	117.60
12		M.N115		115.00	6	1.0133	116.53	15		PRO115		115.00	6	1.0266	118.06
18		CAC115		115.00	6	1.0095	116.09	20		CH.AZUL		115.00	6	1.0238	117.73
23		CH115		115.00	6	1.0130	116.49	26		LOC115		115.00	6	1.0009	115.10
33		STM115		115.00	6	1.0083	115.96	48		TINAJ115		115.00	6	1.0070	115.81
50		M.O115		115.00	6	1.0070	115.80	52		TOC115		115.00	6	1.0035	115.40
54		LM1115		115.00	6	1.0341	118.92	55		LM2115		115.00	6	1.0345	118.97
61		FFIELD		115.00	9	1.0281	118.23	87		CAL115		115.00	6	1.0136	116.56
88		EST115		115.00	6	1.0139	116.60	92		L.V115		115.00	6	1.0137	116.58
109		STA RITA115		115.00	6	1.0305	118.50	110		PTMD115A		115.00	6	1.0224	117.57
111		PTMD115B		115.00	6	1.0224	117.57	123		MIR115		115.00	7	1.0089	116.02
154		CEMPAN15		115.00	6	1.0330	118.80	191		CHANG115		115.00	6	1.0255	117.93
522		TBALBOA 115		115.00	6	1.0345	118.97								

BUSES WITH VOLTAGE LESS THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
19		C.V115		115.00	6	0.9992	114.91	21		C.BAN115		115.00	6	0.9997	114.97
30		MAR115		115.00	6	0.9996	114.96	37		SAN115		115.00	6	0.9985	114.83



AREA 6 [PANAMA ] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING	
66		BLM13B		13.800	V2	33.0	7.9	17.0	0.0	1.0000	33.9	0.9728	47.0			1	6		
67		BLM13C		13.800	V3	33.0	7.9	17.0	0.0	1.0000	33.9	0.9728	47.0			1	6		
68		BLM13D		13.800	V4	33.0	8.1	30.0	0.0	1.0000	34.0	0.9709	47.0			1	6		
70		TGJB13A		13.800	J5	31.0	5.9	20.0	0.0	1.0000	31.6	0.9825	39.4			1	6		
71		TGJB13B		13.800	J6	31.0	5.9	20.0	0.0	1.0000	31.6	0.9825	39.4			1	6		
72		BLMCCA		13.800	T8	31.0	6.8	20.0	0.0	1.0000	31.7	0.9766	50.0			1	6		
73		BLMCCB		13.800	V9	47.0	7.2	40.0	0.0	1.0000	47.5	0.9886	71.0			1	6		
90		EST-13L		13.800	E1	17.0	-1.2	12.0	-5.0	0.9600	17.8	0.9973	27.0			1	6		
94		LV-13.8L		13.800	L1	19.0	-1.1	12.0	-5.0	0.9600	19.8	0.9984	27.0			1	6		
97		FOR13A		13.800	F1	90.0	-30.9	50.0	-50.0	0.9800	97.1	0.9456	111.0			1	6		
98		FOR13B		13.800	F2	90.0	-30.9	50.0	-50.0	0.9800	97.1	0.9456	111.0			1	6		
99		FOR13C		13.800	F3	90.0	-30.9	50.0	-50.0	0.9800	97.1	0.9456	111.0			1	6		
101		BAY13A		13.800	B1	47.7	23.5	50.0	-25.0	1.0000	53.2	0.8973	96.0			1	6	SYST	
102		BAY13B		13.800	B2	47.7	23.5	50.0	-25.0	1.0000	53.2	0.8973	96.0			1	6		
106		PANAM13A		13.800	M1	15.1	2.5	9.0	0.0	0.9800	15.6	0.9867	20.7			1	6		
106		PANAM13A		13.800	M2	15.1	2.5	9.0	0.0	0.9800	15.6	0.9867	20.7			1	6		
106		PANAM13A		13.800	M3	15.1	2.5	9.0	0.0	0.9800	15.6	0.9867	20.7			1	6		
107		PANAM13B		13.800	M4	15.1	2.5	9.0	0.0	0.9800	15.6	0.9867	20.7			1	6		
107		PANAM13B		13.800	M5	15.1	2.5	9.0	0.0	0.9800	15.6	0.9867	20.7			1	6		
107		PANAM13B		13.800	M6	15.1	2.5	9.0	0.0	0.9800	15.6	0.9867	20.7			1	6		
108		BAY13C		13.800	B3	47.7	23.5	50.0	-25.0	1.0000	53.2	0.8973	100.0			1	6		
116		PACORA13		13.800	P1	16.1	2.4	8.8	0.0	1.0000	16.3	0.9894	21.7			1	6		
116		PACORA13		13.800	P2	16.1	2.4	8.8	0.0	1.0000	16.3	0.9894	21.7			1	6		
116		PACORA13		13.800	P3	16.1	2.4	8.8	0.0	1.0000	16.3	0.9894	21.7			1	6		
142		CANJ13A		13.800	C1	40.0	5.7	29.0	-29.0	0.9783	41.3	0.9901	69.0			1	6		
143		CANJ13B		13.800	C2	40.0	5.7	29.0	-29.0	0.9783	41.3	0.9901	69.0			1	6		
521		TCARIBE	13.813	13.800	G1	15.5	3.9	12.5	0.0	1.0000	16.0	0.9691	20.9			1	6		
521		TCARIBE	13.813	13.800	G2	15.5	3.9	12.5	0.0	1.0000	16.0	0.9691	20.9			1	6		
521		TCARIBE	13.813	13.800	G3	15.5	3.9	12.5	0.0	1.0000	16.0	0.9691	20.9			1	6		
523		TBALBOA	13A	13.800	G1	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9685	10.9			1	6		
523		TBALBOA	13A	13.800	G2	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9685	10.9			1	6		
523		TBALBOA	13A	13.800	G3	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9685	10.9			1	6		
523		TBALBOA	13A	13.800	G4	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9685	10.9			1	6		
523		TBALBOA	13A	13.800	G5	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9685	10.9			1	6		
524		TBALBOA	13B	13.800	10	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9685	10.9			1	6		
524		TBALBOA	13B	13.800	G6	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9685	10.9			1	6		
524		TBALBOA	13B	13.800	G7	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9685	10.9			1	6		
524		TBALBOA	13B	13.800	G8	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9685	10.9			1	6		
524		TBALBOA	13B	13.800	G9	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9685	10.9			1	6		
SUBSYSTEM TOTALS						1035.5	91.1	729.6	-358.6				1519.0						

AREA 7 [ACANAL ] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
126		MIR13A		12.000	G1	8.6	0.0	5.0	0.0	1.0479	8.2	1.0000	13.5			2		



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127	MIR13B	12.000	G2	8.6	0.0	5.0	0.0	1.0479	8.2	1.0000	13.5	2	7
130	MIR13F	13.800	G5	9.7	4.2	8.0	0.0	1.0000	10.6	0.9181	27.7	2	7
134	MAD6A	6.9000	G1	9.7	1.0	6.0	-6.0	1.0000	9.7	0.9951	13.0	2	7
135	MAD6B	6.9000	G2	9.7	1.0	6.0	-6.0	1.0000	9.7	0.9952	13.0	2	7
136	MAD6C	6.9000	G3	9.7	1.0	6.0	-6.0	1.0000	9.7	0.9952	13.0	2	7
140	GAT6A	6.9000	G1	1.9	0.0	2.0	-2.0	1.0000	1.9	0.9998	4.1	2	7
140	GAT6A	6.9000	G2	1.9	0.0	2.0	-2.0	1.0000	1.9	0.9998	4.1	2	7
140	GAT6A	6.9000	G3	1.9	0.0	2.0	-2.0	1.0000	1.9	0.9998	4.1	2	7
141	GAT6B	6.9000	G4	3.9	-0.7	3.0	-3.0	1.0000	4.0	0.9844	5.6	2	7
141	GAT6B	6.9000	G5	3.9	-0.7	3.0	-3.0	1.0000	4.0	0.9844	6.2	2	7
141	GAT6B	6.9000	G6	3.9	-0.7	3.0	-3.0	1.0000	4.0	0.9844	6.2	2	7
SUBSYSTEM TOTALS				73.4	5.1	51.0	-33.0				124.2		



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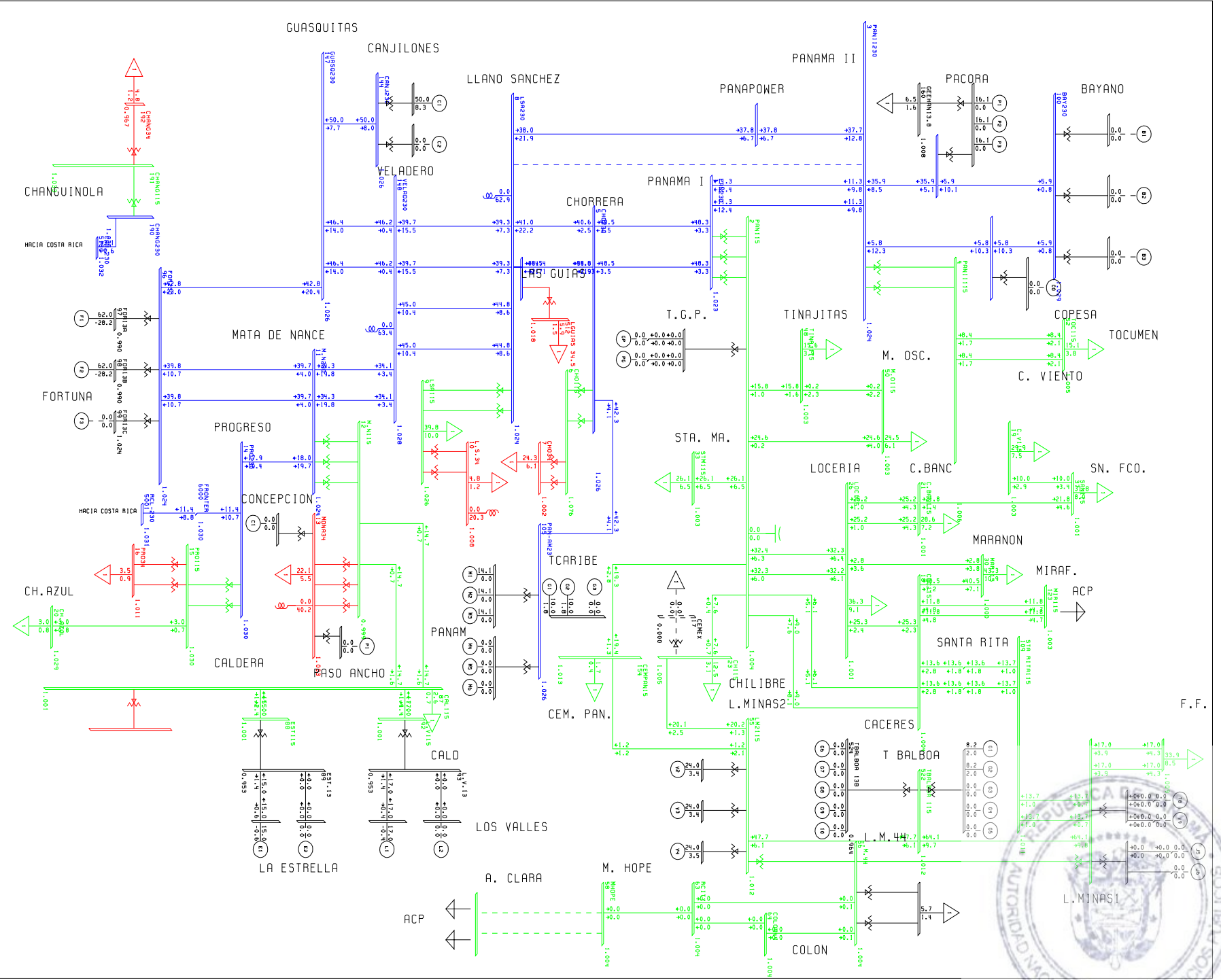
**PLAN DE EXPANSION DEL SIN CON CENTROAMERICA JUNIO DEL 2008  
AÑO 2009 ESCENARIO MODERADO DEMANDA MINIMA VERANO**



*de*



P. EXP SIN CON C.-R. JUNIO 2008 ESC DEM MIN VER  
 R 0 2009 TBRUBOR, TCARIBE, TATLANTICO EN SANTA RITA 115  
 THU, DEC 27 2007 18:33  
 BUS - VOLTAGE(P.U)  
 BRNCH - MM/MVAR  
 EQUIPMENT - MM/MVAR  
 KV: 115 .35 .5115



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PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E THU, DEC 27 2007 18:23  
P. EXP SIN CON C.A. JUNIO 2008 ESC DEM MIN VER  
AÑO 2009 TBALBOA, TCARIBE, TATLANTICO EN SANTA RITA 115

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
1		PAN230		230.00	6	1.0228	235.24	3		PANII230		230.00	6	1.0245	235.62
5		CHO230		230.00	6	1.0260	235.98	8		LSA230		230.00	6	1.0236	235.42
11		M.N230		230.00	6	1.0236	235.43	14		PRO230		230.00	6	1.0297	236.84
96		FOR230		230.00	6	1.0237	235.45	100		BAY230		230.00	6	1.0286	236.58
103		COPESA23		230.00	6	1.0256	235.89	105		PAN-AM23		230.00	6	1.0260	235.98
115		PACORA23		230.00	6	1.0268	236.17	144		CANJ230		230.00	6	1.0262	236.03
147		GUASQ230		230.00	6	1.0263	236.04	148		VELAD230		230.00	6	1.0276	236.34
190		CHANG230		230.00	6	1.0348	238.01	511		LGUIAS230		230.00	6	1.0274	236.31
515		PANPOWER230		230.00	6	1.0287	236.61	6000		FRONTER		230.00	6	1.0304	237.00

BUSES WITH VOLTAGE LESS THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
* NONE *															

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E THU, DEC 27 2007 18:24  
P. EXP SIN CON C.A. JUNIO 2008 ESC DEM MIN VER  
AÑO 2009 TBALBOA, TCARIBE, TATLANTICO EN SANTA RITA 115

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2		PAN115		115.00	6	1.0041	115.47	4		PANII115		115.00	6	1.0061	115.71
6		CHO115		115.00	6	1.0756	123.69	9		LSA115		115.00	6	1.0262	118.01
15		PRO115		115.00	6	1.0296	118.40	18		CAC115		115.00	6	1.0039	115.45
19		C.V115		115.00	6	1.0027	115.31	20		CH.AZUL		115.00	6	1.0289	118.33
21		C.BAN115		115.00	6	1.0009	115.11	23		CH115		115.00	6	1.0053	115.61
26		LOC115		115.00	6	1.0012	115.14	30		MAR115		115.00	6	1.0004	115.04
33		STM115		115.00	6	1.0034	115.39	37		SAN115		115.00	6	1.0007	115.08
48		TINAJ115		115.00	6	1.0032	115.37	50		M.O115		115.00	6	1.0032	115.37
52		TOC115		115.00	6	1.0051	115.59	54		LM115		115.00	6	1.0114	116.31
55		LM2115		115.00	6	1.0121	116.39	61		FFIELD		115.00	9	1.0090	116.04
87		CAL115		115.00	6	1.0006	115.07	88		EST115		115.00	6	1.0009	115.11
92		L.V115		115.00	6	1.0007	115.08	109		STA RITA115		115.00	6	1.0107	116.23
110		PTMD115A		115.00	6	1.0085	115.98	111		PTMD115B		115.00	6	1.0085	115.98
123		MIR115		115.00	7	1.0034	115.39	154		CEMPAN15		115.00	6	1.0128	116.47
191		CHANG115		115.00	6	1.0332	118.81	522		TBALBOA 115		115.00	6	1.0118	116.36

BUSES WITH VOLTAGE LESS THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
12		M.N115		115.00	6	0.9990	114.89								



PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E THU, DEC 27 2007 18:23  
P. EXP SIN CON C.A. JUNIO 2008 ESC DEM MIN VER  
AÑO 2009 TBALBOA, TCARIBE, TATLANTICO EN SANTA RITA 115

AREA 6 [PANAMA ] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
66		BLM13B		13.800	V2	24.0	3.4	17.0	0.0	0.9700	25.0	0.9903	47.0			1	6	
67		BLM13C		13.800	V3	24.0	3.4	17.0	0.0	0.9700	25.0	0.9903	47.0			1	6	
68		BLM13D		13.800	V4	24.0	3.5	30.0	0.0	0.9700	25.0	0.9897	47.0			1	6	
90		EST-13L		13.800	E1	15.0	-0.6	12.0	-5.0	0.9500	15.8	0.9992	27.0			1	6	
94		LV-13.8L		13.800	L1	17.0	-0.4	12.0	-5.0	0.9500	17.9	0.9997	27.0			1	6	
97		FOR13A		13.800	F1	62.0	-28.2	50.0	-50.0	0.9900	68.8	0.9101	111.0			1	6	SYST
98		FOR13B		13.800	F2	62.0	-28.2	50.0	-50.0	0.9900	68.9	0.9102	111.0			1	6	
106		PANAM13A		13.800	M1	14.1	0.0	9.0	0.0	0.9962	14.2	1.0000	20.7			1	6	
106		PANAM13A		13.800	M2	14.1	0.0	9.0	0.0	0.9962	14.2	1.0000	20.7			1	6	
106		PANAM13A		13.800	M3	14.1	0.0	9.0	0.0	0.9962	14.2	1.0000	20.7			1	6	
116		PACORA13		13.800	P1	16.1	0.0	8.8	0.0	1.0205	15.8	1.0000	21.7			1	6	
116		PACORA13		13.800	P2	16.1	0.0	8.8	0.0	1.0205	15.8	1.0000	21.7			1	6	
116		PACORA13		13.800	P3	16.1	0.0	8.8	0.0	1.0205	15.8	1.0000	21.7			1	6	
142		CANJ13A		13.800	C1	50.0	8.3	29.0	-29.0	0.9783	51.8	0.9863	69.0			1	6	
521		TCARIBE	13.813	13.800	G1	10.0	1.8	8.8	0.0	0.9700	10.5	0.9840	21.7			1	6	
521		TCARIBE	13.813	13.800	G2	10.0	1.8	8.8	0.0	0.9700	10.5	0.9840	21.7			1	6	
523		TBALBOA	13A	13.800	G1	8.2	2.0	6.6	-6.6	0.9700	8.7	0.9703	10.9			1	6	
523		TBALBOA	13A	13.800	G2	8.2	2.0	6.6	-6.6	0.9700	8.7	0.9703	10.9			1	6	
SUBSYSTEM TOTALS						405.1	-31.3	301.2	-152.1				678.4					

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E THU, DEC 27 2007 18:23  
P. EXP SIN CON C.A. JUNIO 2008 ESC DEM MIN VER  
AÑO 2009 TBALBOA, TCARIBE, TATLANTICO EN SANTA RITA 115

AREA 7 [ACANAL ] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING	
135		MAD6B		6.9000	G2	10.0	1.5	6.0	-6.0	1.0000	10.1	0.9882	13.0			2	7		
136		MAD6C		6.9000	G3	10.0	1.6	6.0	-6.0	1.0000	10.1	0.9882	13.0			2	7		
140		GAT6A		6.9000	G1	2.0	0.0	2.0	-2.0	1.0000	2.0	0.9997	4.1			2	7		
140		GAT6A		6.9000	G2	2.0	0.0	2.0	-2.0	1.0000	2.0	0.9997	4.1			2	7		
140		GAT6A		6.9000	G3	2.0	0.0	2.0	-2.0	1.0000	2.0	0.9997	4.1			2	7		
141		GAT6B		6.9000	G4	4.0	-0.8	3.0	-3.0	1.0000	4.1	0.9815	5.6			2	7		
141		GAT6B		6.9000	G5	4.0	-0.8	3.0	-3.0	1.0000	4.1	0.9815	6.2			2	7		
141		GAT6B		6.9000	G6	4.0	-0.8	3.0	-3.0	1.0000	4.1	0.9815	6.2			2	7		
SUBSYSTEM TOTALS									38.0	0.6	27.0	-27.0						56.4	

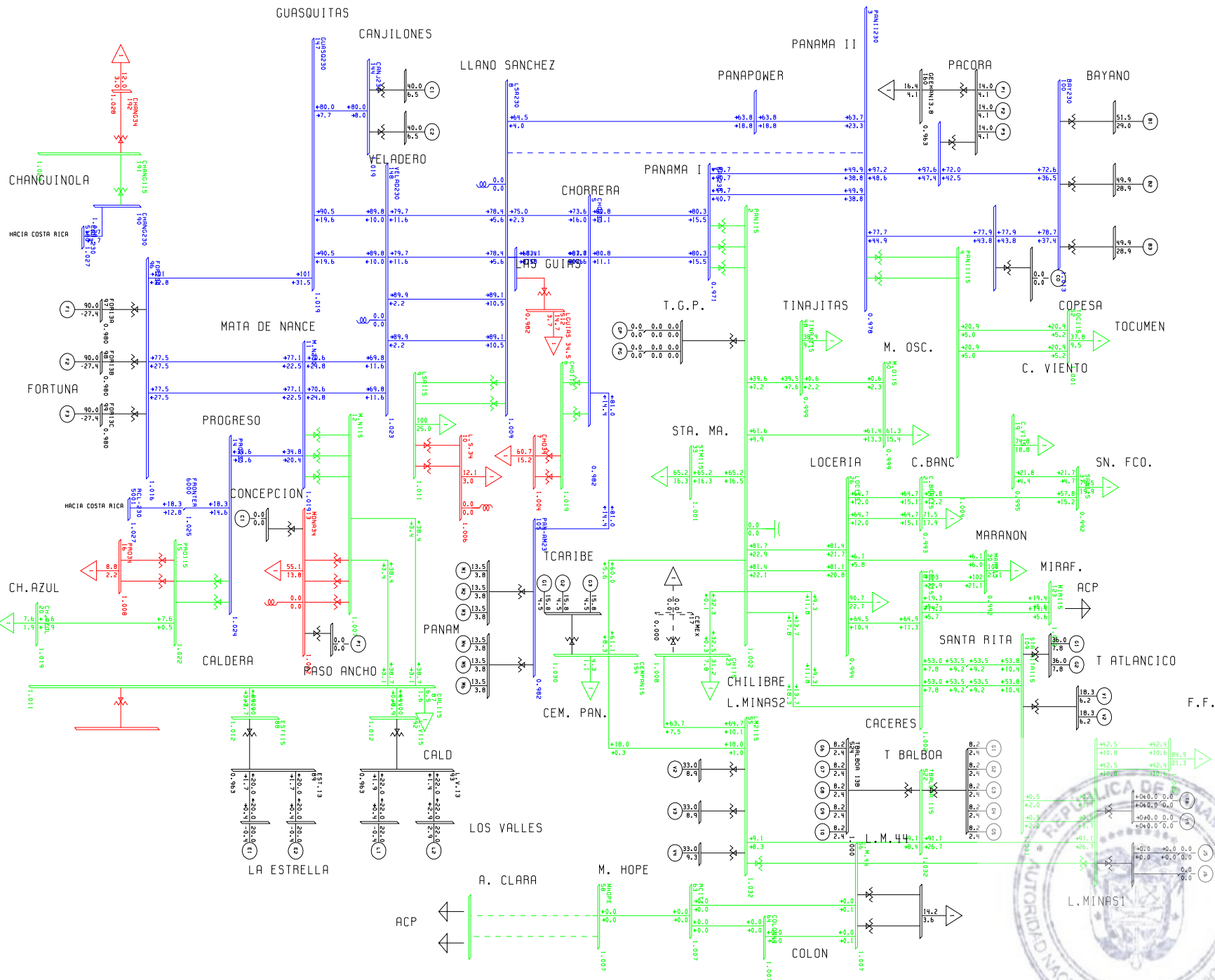


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PLAN DE EXPANSION DEL SIN CON CENTROAMERICA JUNIO DEL 2008  
AÑO 2009 ESCENARIO MODERADO DEMANDA MAXIMA INVIERNO  
Contingencia 1: Llano Sánchez - Panamá II



*de*



*Handwritten signature or initials.*

## Contingencia 1: Llano Sánchez- Panamá II

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E THU, DEC 27 2007 13:47  
 P. EXP-SIN CON C.A. JUNIO 2008 DEM MAX INV ESSTUDIOS BASICO  
 AÑO 2009 CONT 1 LLANO SANCHEZ-PMA II

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
8		LSA230		230.00	6	1.0088	232.02	11		M.N230		230.00	6	1.0192	234.42
14		PRO230		230.00	6	1.0243	235.59	96		FOR230		230.00	6	1.0158	233.64
100		BAY230		230.00	6	1.0134	233.08	144		CANJ230		230.00	6	1.0191	234.39
147		GUASQ230		230.00	6	1.0191	234.39	148		VELAD230		230.00	6	1.0229	235.26
190		CHANG230		230.00	6	1.0275	236.33	6000		FRONTER		230.00	6	1.0253	235.81

BUSES WITH VOLTAGE LESS THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
1		PAN230		230.00	6	0.9714	223.41	3		PANII230		230.00	6	0.9778	224.90
5		CHO230		230.00	6	0.9818	225.81	103		COPESA23		230.00	6	0.9836	226.23
105		PAN-AM23		230.00	6	0.9819	225.83	115		PACORA23		230.00	6	0.9897	227.63
511		LGUIAS230		230.00	6	0.9981	229.57	515		PANPOWER230		230.00	6	0.9869	226.98

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E THU, DEC 27 2007 13:47  
 P. EXP-SIN CON C.A. JUNIO 2008 DEM MAX INV ESSTUDIOS BASICO  
 AÑO 2009 CONT 1 LLANO SANCHEZ-PMA II

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2		PAN115		115.00	6	1.0025	115.29	4		PANII115		115.00	6	1.0037	115.43
6		CHO115		115.00	6	1.0194	117.23	9		LSA115		115.00	6	1.0109	116.26
12		M.N115		115.00	6	1.0073	115.84	15		PRO115		115.00	6	1.0224	117.57
18		CAC115		115.00	6	1.0021	115.24	20		CH.AZUL		115.00	6	1.0195	117.24
23		CH115		115.00	6	1.0080	115.91	33		STM115		115.00	6	1.0008	115.09
52		TOC115		115.00	6	1.0011	115.13	54		LM115		115.00	6	1.0314	118.61
55		LM2115		115.00	6	1.0320	118.68	61		FFIELD		115.00	9	1.0254	117.92
87		CAL115		115.00	6	1.0111	116.28	88		EST115		115.00	6	1.0121	116.39
92		L.V115		115.00	6	1.0117	116.35	109		STA RITA115		115.00	6	1.0310	118.57
110		PTMD115A		115.00	6	1.0195	117.24	111		PTMD115B		115.00	6	1.0195	117.24
123		MIR115		115.00	7	1.0019	115.22	154		CEMPAN15		115.00	6	1.0302	118.47
191		CHANG115		115.00	6	1.0230	117.64	522		TBALBOA 115		115.00	6	1.0319	118.67

BUSES WITH VOLTAGE LESS THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
19		C.V115		115.00	6	0.9953	114.46	21		C.BAN115		115.00	6	0.9928	114.17
26		LOC115		115.00	6	0.9938	114.29	30		MAR115		115.00	6	0.9923	114.12
37		SAN115		115.00	6	0.9919	114.06	48		TINAJ115		115.00	6	0.9995	114.94
50		M.O115		115.00	6	0.9994	114.93								



AREA 6 [PANAMA ] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
66		BLM13B		13.800	V2	33.0	8.9	17.0	0.0	1.0000	34.2	0.9653	47.0			1	6	
67		BLM13C		13.800	V3	33.0	8.9	17.0	0.0	1.0000	34.2	0.9653	47.0			1	6	
68		BLM13D		13.800	V4	33.0	9.3	30.0	0.0	1.0000	34.3	0.9628	47.0			1	6	
90		EST-13L		13.800	E1	20.0	-0.4	12.0	-5.0	0.9600	20.8	0.9998	27.0			1	6	
91		EST-13T		13.800	E2	20.0	-0.4	12.0	-5.0	0.9600	20.8	0.9998	27.0			1	6	
94		LV-13.8L		13.800	L1	22.0	-0.4	12.0	-5.0	0.9600	22.9	0.9999	27.0			1	6	
95		LV-13.8T		13.800	L2	22.0	2.9	12.0	-5.0	0.9700	22.9	0.9913	27.0			1	6	
97		FOR13A		13.800	F1	90.0	-27.4	50.0	-50.0	0.9800	96.0	0.9565	111.0			1	6	
98		FOR13B		13.800	F2	90.0	-27.4	50.0	-50.0	0.9800	96.0	0.9565	111.0			1	6	
99		FOR13C		13.800	F3	90.0	-27.4	50.0	-50.0	0.9800	96.0	0.9565	111.0			1	6	
101		BAY13A		13.800	B1	51.5	29.0	50.0	-25.0	1.0000	59.1	0.8710	96.0			1	6	SYST
102		BAY13B		13.800	B2	49.9	28.9	50.0	-25.0	1.0000	57.7	0.8652	96.0			1	6	
106		PANAM13A		13.800	M1	13.5	3.8	9.0	0.0	0.9800	14.3	0.9625	20.7			1	6	
106		PANAM13A		13.800	M2	13.5	3.8	9.0	0.0	0.9800	14.3	0.9625	20.7			1	6	
106		PANAM13A		13.800	M3	13.5	3.8	9.0	0.0	0.9800	14.3	0.9625	20.7			1	6	
107		PANAM13B		13.800	M4	13.5	3.8	9.0	0.0	0.9800	14.3	0.9625	20.7			1	6	
107		PANAM13B		13.800	M5	13.5	3.8	9.0	0.0	0.9800	14.3	0.9625	20.7			1	6	
107		PANAM13B		13.800	M6	13.5	3.8	9.0	0.0	0.9800	14.3	0.9625	20.7			1	6	
108		BAY13C		13.800	B3	49.9	28.9	50.0	-25.0	1.0000	57.7	0.8652	100.0			1	6	
116		PACORA13		13.800	P1	14.0	4.1	8.8	0.0	1.0000	14.6	0.9589	21.7			1	6	
116		PACORA13		13.800	P2	14.0	4.1	8.8	0.0	1.0000	14.6	0.9589	21.7			1	6	
116		PACORA13		13.800	P3	14.0	4.1	8.8	0.0	1.0000	14.6	0.9589	21.7			1	6	
142		CANJ13A		13.800	C1	40.0	6.5	29.0	-29.0	0.9783	41.4	0.9872	69.0			1	6	
143		CANJ13B		13.800	C2	40.0	6.5	29.0	-29.0	0.9783	41.4	0.9872	69.0			1	6	
521		TCARIBE	13.813	800	G1	15.8	4.5	12.5	0.0	1.0000	16.4	0.9612	20.9			1	6	
521		TCARIBE	13.813	800	G2	15.8	4.5	12.5	0.0	1.0000	16.4	0.9612	20.9			1	6	
521		TCARIBE	13.813	800	G3	15.8	4.5	12.5	0.0	1.0000	16.4	0.9612	20.9			1	6	
523		TBALBOA	13A	13.800	G1	8.2	2.4	6.6	-6.6	1.0000	8.5	0.9593	10.9			1	6	
523		TBALBOA	13A	13.800	G2	8.2	2.4	6.6	-6.6	1.0000	8.5	0.9593	10.9			1	6	
523		TBALBOA	13A	13.800	G3	8.2	2.4	6.6	-6.6	1.0000	8.5	0.9593	10.9			1	6	
523		TBALBOA	13A	13.800	G4	8.2	2.4	6.6	-6.6	1.0000	8.5	0.9593	10.9			1	6	
523		TBALBOA	13A	13.800	G5	8.2	2.4	6.6	-6.6	1.0000	8.5	0.9593	10.9			1	6	
524		TBALBOA	13B	13.800	10	8.2	2.4	6.6	-6.6	1.0000	8.5	0.9593	10.9			1	6	
524		TBALBOA	13B	13.800	G6	8.2	2.4	6.6	-6.6	1.0000	8.5	0.9593	10.9			1	6	
524		TBALBOA	13B	13.800	G7	8.2	2.4	6.6	-6.6	1.0000	8.5	0.9593	10.9			1	6	
524		TBALBOA	13B	13.800	G8	8.2	2.4	6.6	-6.6	1.0000	8.5	0.9593	10.9			1	6	
524		TBALBOA	13B	13.800	G9	8.2	2.4	6.6	-6.6	1.0000	8.5	0.9593	10.9			1	6	
525		TATLANTIC13A13	800	G1	36.0	7.8	28.5	0.0	1.0000	36.8	0.9776	47.5			1	6		
525		TATLANTIC13A13	800	G2	36.0	7.8	28.5	0.0	1.0000	36.8	0.9776	47.5			1	6		
526		TATLANTIC13B13	800	V1	18.3	6.2	15.0	0.0	1.0000	19.3	0.9475	25.0			1	6		
526		TATLANTIC13B13	800	V2	18.3	6.2	15.0	0.0	1.0000	19.3	0.9475	25.0			1	6		
SUBSYSTEM TOTALS						1045.3	147.2	740.6	-368.6				1518.1					

AREA 7 [ACANAL ] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
------	-----	------	-----	-------	----	----	------	------	------	-------	---------	----	---------	-----------	--------	------	------	-------



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126	MIR13A	12.000	G1	8.6	0.0	5.0	0.0	1.0442	8.2	1.0000	13.5	2	7
127	MIR13B	12.000	G2	8.6	0.0	5.0	0.0	1.0442	8.2	1.0000	13.5	2	7
130	MIR13F	13.800	G5	9.7	5.8	8.0	0.0	1.0000	11.3	0.8580	27.7	2	7
134	MAD6A	6.9000	G1	9.7	1.2	6.0	-6.0	1.0000	9.7	0.9928	13.0	2	7
135	MAD6B	6.9000	G2	9.7	1.2	6.0	-6.0	1.0000	9.7	0.9929	13.0	2	7
136	MAD6C	6.9000	G3	9.7	1.2	6.0	-6.0	1.0000	9.7	0.9929	13.0	2	7
140	GAT6A	6.9000	G1	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9989	4.1	2	7
140	GAT6A	6.9000	G2	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9989	4.1	2	7
140	GAT6A	6.9000	G3	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9989	4.1	2	7
141	GAT6B	6.9000	G4	3.9	-0.6	3.0	-3.0	1.0000	3.9	0.9864	5.6	2	7
141	GAT6B	6.9000	G5	3.9	-0.6	3.0	-3.0	1.0000	3.9	0.9864	6.2	2	7
141	GAT6B	6.9000	G6	3.9	-0.6	3.0	-3.0	1.0000	3.9	0.9864	6.2	2	7
SUBSYSTEM TOTALS				73.3	7.6	51.0	-33.0				124.2		



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**PLAN DE EXPANSION DEL SIN CON CENTROAMERICA JUNIO DEL 2008  
AÑO 2009 ESCENARIO MODERADO DEMANDA MAXIMA INVIERNO  
Contingencia 2: Guasquitas-Veladero**



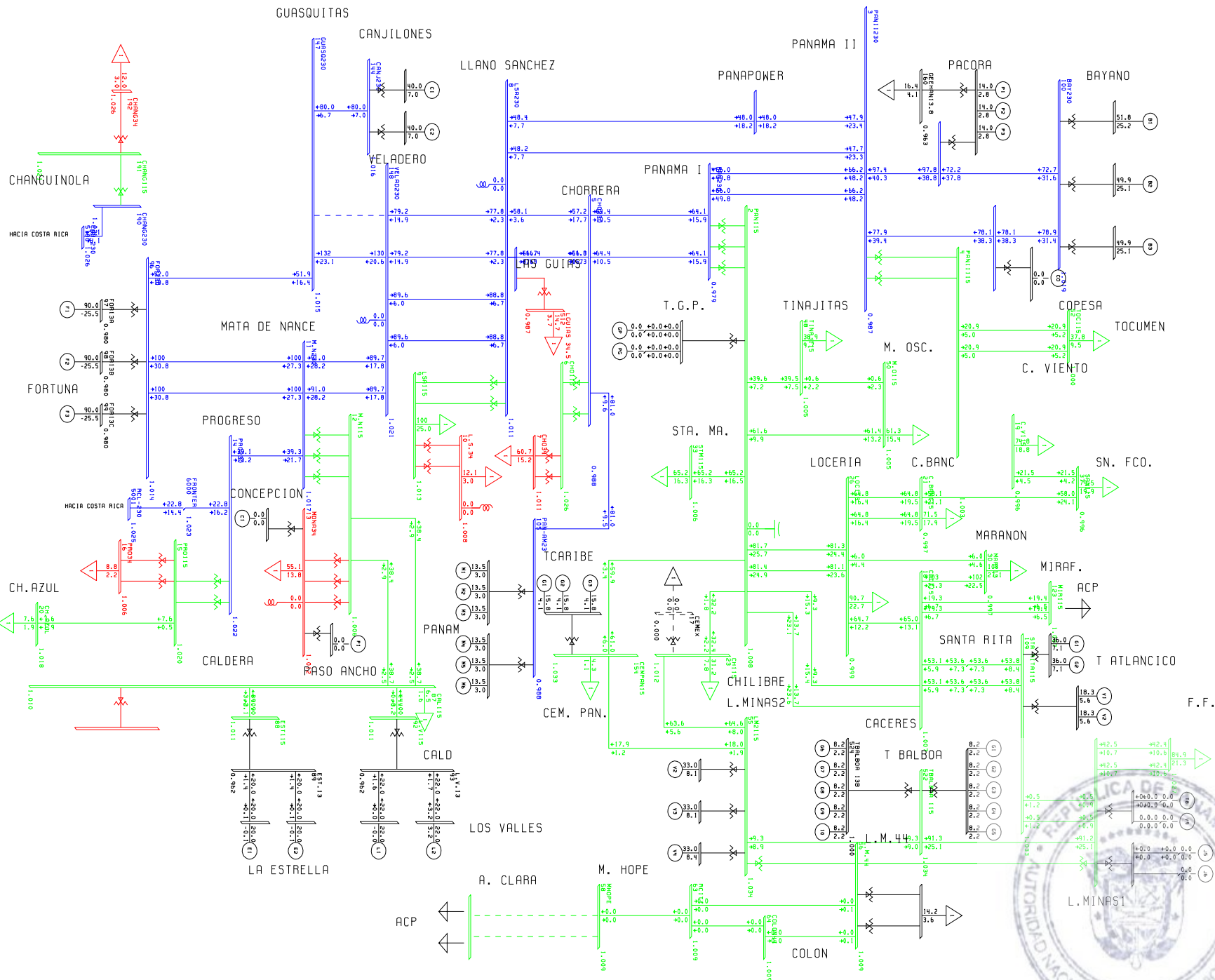
*de*



P. EXP-SIN CON C.A.R. JUNIO 2008 DEM MAX INV ESTUDIOS BASICO  
R 0 2009 CONT 2 GUASQUITAS - VELADERO  
THU, DEC 27 2007 18:36

KV: 114, 135, 115

BUS - VOLTAGE (PU)  
BRANCH - MW/MVAR  
EQUIPMENT - MW/MVAR



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## Contingencia 2: Guasquitas-Veladero

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E THU, DEC 27 2007 13:54  
 P. EXP-SIN CON C.A. JUNIO 2008 DEM MAX INV ESSTUDIOS BASICO  
 AÑO 2009 CONT 2 GUASQUITAS - VELADERO

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
8		LSA230		230.00	6	1.0110	232.54	11		M.N230		230.00	6	1.0169	233.88
14		PRO230		230.00	6	1.0223	235.14	96		FOR230		230.00	6	1.0137	233.14
100		BAY230		230.00	6	1.0186	234.27	144		CANJ230		230.00	6	1.0155	233.57
147		GUASQ230		230.00	6	1.0155	233.56	148		VELAD230		230.00	6	1.0212	234.88
190		CHANG230		230.00	6	1.0260	235.99	511		LGUIAS230		230.00	6	1.0024	230.56
6000		FRONTER		230.00	6	1.0234	235.38								

BUSES WITH VOLTAGE LESS THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
1		PAN230		230.00	6	0.9787	225.10	3		PANII230		230.00	6	0.9867	226.95
5		CHO230		230.00	6	0.9879	227.21	103		COPESA23		230.00	6	0.9920	228.15
105		PAN-AM23		230.00	6	0.9879	227.23	115		PACORA23		230.00	6	0.9971	229.32
515		PANPOWER230		230.00	6	0.9951	228.87								

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E THU, DEC 27 2007 13:54  
 P. EXP-SIN CON C.A. JUNIO 2008 DEM MAX INV ESSTUDIOS BASICO  
 AÑO 2009 CONT 2 GUASQUITAS - VELADERO

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2		PAN115		115.00	6	1.0079	115.91	4		PANII115		115.00	6	1.0029	115.34
6		CHO115		115.00	6	1.0260	117.99	9		LSA115		115.00	6	1.0133	116.53
12		M.N115		115.00	6	1.0056	115.64	15		PRO115		115.00	6	1.0204	117.35
18		CAC115		115.00	6	1.0075	115.86	20		CH.AZUL		115.00	6	1.0175	117.01
23		CH115		115.00	6	1.0119	116.37	33		STM115		115.00	6	1.0062	115.72
48		TINAJ115		115.00	6	1.0049	115.57	50		M.O115		115.00	6	1.0049	115.56
52		TOC115		115.00	6	1.0003	115.03	54		LM1115		115.00	6	1.0333	118.83
55		LM2115		115.00	6	1.0339	118.90	61		FFIELD		115.00	9	1.0273	118.14
87		CAL115		115.00	6	1.0100	116.15	88		EST115		115.00	6	1.0110	116.27
92		L.V115		115.00	6	1.0106	116.22	109		STA RITA115		115.00	6	1.0331	118.80
110		PTMD115A		115.00	6	1.0230	117.64	111		PTMD115B		115.00	6	1.0230	117.64
123		MIR115		115.00	7	1.0069	115.80	154		CEMPAN15		115.00	6	1.0325	118.74
191		CHANG115		115.00	6	1.0215	117.47	522		TBALBOA 115		115.00	6	1.0338	118.89

BUSES WITH VOLTAGE LESS THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
19		C.V115		115.00	6	0.9963	114.57	21		C.BAN115		115.00	6	0.9975	114.71
26		LOC115		115.00	6	0.9986	114.84	30		MAR115		115.00	6	0.9975	114.71
37		SAN115		115.00	6	0.9962	114.56								



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PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E THU, DEC 27 2007 13:53  
P. EXP-SIN CON C.A. JUNIO 2008 DEM MAX INV ESSTUDIOS BASICO  
Año 2009 CONT 2 GUASQUITAS - VELADERO

AREA 6 [PANAMA ] MACHINE SUMMARY:																		
BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
66		BLM13B		13.800	V2	33.0	8.1	17.0	0.0	1.0000	34.0	0.9711	47.0				1	6
67		BLM13C		13.800	V3	33.0	8.1	17.0	0.0	1.0000	34.0	0.9711	47.0				1	6
68		BLM13D		13.800	V4	33.0	8.4	30.0	0.0	1.0000	34.1	0.9690	47.0				1	6
90		EST-13L		13.800	E1	20.0	-0.1	12.0	-5.0	0.9600	20.8	1.0000	27.0				1	6
91		EST-13T		13.800	E2	20.0	-0.1	12.0	-5.0	0.9600	20.8	1.0000	27.0				1	6
94		LV-13.8L		13.800	L1	22.0	0.0	12.0	-5.0	0.9600	22.9	1.0000	27.0				1	6
95		LV-13.8T		13.800	L2	22.0	3.2	12.0	-5.0	0.9700	22.9	0.9893	27.0				1	6
97		FOR13A		13.800	F1	90.0	-25.5	50.0	-50.0	0.9800	95.4	0.9622	111.0				1	6
98		FOR13B		13.800	F2	90.0	-25.5	50.0	-50.0	0.9800	95.4	0.9622	111.0				1	6
99		FOR13C		13.800	F3	90.0	-25.5	50.0	-50.0	0.9800	95.4	0.9622	111.0				1	6
101		BAY13A		13.800	B1	51.8	25.2	50.0	-25.0	1.0000	57.6	0.8993	96.0				1	6
102		BAY13B		13.800	B2	49.9	25.1	50.0	-25.0	1.0000	55.9	0.8938	96.0				1	6
106		PANAM13A		13.800	M1	13.5	3.0	9.0	0.0	0.9800	14.1	0.9768	20.7				1	6
106		PANAM13A		13.800	M2	13.5	3.0	9.0	0.0	0.9800	14.1	0.9768	20.7				1	6
106		PANAM13A		13.800	M3	13.5	3.0	9.0	0.0	0.9800	14.1	0.9768	20.7				1	6
107		PANAM13B		13.800	M4	13.5	3.0	9.0	0.0	0.9800	14.1	0.9768	20.7				1	6
107		PANAM13B		13.800	M5	13.5	3.0	9.0	0.0	0.9800	14.1	0.9768	20.7				1	6
107		PANAM13B		13.800	M6	13.5	3.0	9.0	0.0	0.9800	14.1	0.9768	20.7				1	6
108		BAY13C		13.800	B3	49.9	25.1	50.0	-25.0	1.0000	55.9	0.8938	100.0				1	6
116		PACORA13		13.800	P1	14.0	2.8	8.8	0.0	1.0000	14.3	0.9804	21.7				1	6
116		PACORA13		13.800	P2	14.0	2.8	8.8	0.0	1.0000	14.3	0.9804	21.7				1	6
116		PACORA13		13.800	P3	14.0	2.8	8.8	0.0	1.0000	14.3	0.9804	21.7				1	6
142		CANJ13A		13.800	C1	40.0	7.0	29.0	-29.0	0.9783	41.5	0.9849	69.0				1	6
143		CANJ13B		13.800	C2	40.0	7.0	29.0	-29.0	0.9783	41.5	0.9849	69.0				1	6
521		TCARIBE	13.813	800	G1	15.8	4.1	12.5	0.0	1.0000	16.3	0.9685	20.9				1	6
521		TCARIBE	13.813	800	G2	15.8	4.1	12.5	0.0	1.0000	16.3	0.9685	20.9				1	6
521		TCARIBE	13.813	800	G3	15.8	4.1	12.5	0.0	1.0000	16.3	0.9685	20.9				1	6
523		TBALBOA	13A	13.800	G1	8.2	2.2	6.6	-6.6	1.0000	8.5	0.9661	10.9				1	6
523		TBALBOA	13A	13.800	G2	8.2	2.2	6.6	-6.6	1.0000	8.5	0.9661	10.9				1	6
523		TBALBOA	13A	13.800	G3	8.2	2.2	6.6	-6.6	1.0000	8.5	0.9661	10.9				1	6
523		TBALBOA	13A	13.800	G4	8.2	2.2	6.6	-6.6	1.0000	8.5	0.9661	10.9				1	6
523		TBALBOA	13A	13.800	G5	8.2	2.2	6.6	-6.6	1.0000	8.5	0.9661	10.9				1	6
524		TBALBOA	13B	13.800	10	8.2	2.2	6.6	-6.6	1.0000	8.5	0.9661	10.9				1	6
524		TBALBOA	13B	13.800	G6	8.2	2.2	6.6	-6.6	1.0000	8.5	0.9661	10.9				1	6
524		TBALBOA	13B	13.800	G7	8.2	2.2	6.6	-6.6	1.0000	8.5	0.9661	10.9				1	6
524		TBALBOA	13B	13.800	G8	8.2	2.2	6.6	-6.6	1.0000	8.5	0.9661	10.9				1	6
524		TBALBOA	13B	13.800	G9	8.2	2.2	6.6	-6.6	1.0000	8.5	0.9661	10.9				1	6
525		TATLANTIC13A13		13.800	G1	36.0	7.1	28.5	0.0	1.0000	36.7	0.9809	47.5				1	6
525		TATLANTIC13A13		13.800	G2	36.0	7.1	28.5	0.0	1.0000	36.7	0.9809	47.5				1	6
526		TATLANTIC13B13		13.800	V1	18.3	5.6	15.0	0.0	1.0000	19.1	0.9568	25.0				1	6
526		TATLANTIC13B13		13.800	V2	18.3	5.6	15.0	0.0	1.0000	19.1	0.9568	25.0				1	6
SUBSYSTEM TOTALS						1045.6	126.2	740.6	-368.6				1518.1					

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E THU, DEC 27 2007 13:53  
P. EXP-SIN CON C.A. JUNIO 2008 DEM MAX INV ESSTUDIOS BASICO  
Año 2009 CONT 2 GUASQUITAS - VELADERO

AREA 7 [ACANAL ] MACHINE SUMMARY:																		
BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
126		MIR13A		12.000	G1	8.6	0.0	5.0	0.0	1.0469	8.2	1.0000	13.5				2	



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127	MIR13B	12.000	G2	8.6	0.0	5.0	0.0	1.0469	8.2	1.0000	13.5	2	7
130	MIR13F	13.800	G5	9.7	4.6	8.0	0.0	1.0000	10.7	0.9019	27.7	2	7
134	MAD6A	6.9000	G1	9.7	1.0	6.0	-6.0	1.0000	9.7	0.9945	13.0	2	7
135	MAD6B	6.9000	G2	9.7	1.0	6.0	-6.0	1.0000	9.7	0.9946	13.0	2	7
136	MAD6C	6.9000	G3	9.7	1.0	6.0	-6.0	1.0000	9.7	0.9945	13.0	2	7
140	GAT6A	6.9000	G1	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9996	4.1	2	7
140	GAT6A	6.9000	G2	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9996	4.1	2	7
140	GAT6A	6.9000	G3	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9996	4.1	2	7
141	GAT6B	6.9000	G4	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9847	5.6	2	7
141	GAT6B	6.9000	G5	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9847	6.2	2	7
141	GAT6B	6.9000	G6	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9847	6.2	2	7
SUBSYSTEM TOTALS				73.3	5.8	51.0	-33.0				124.2		

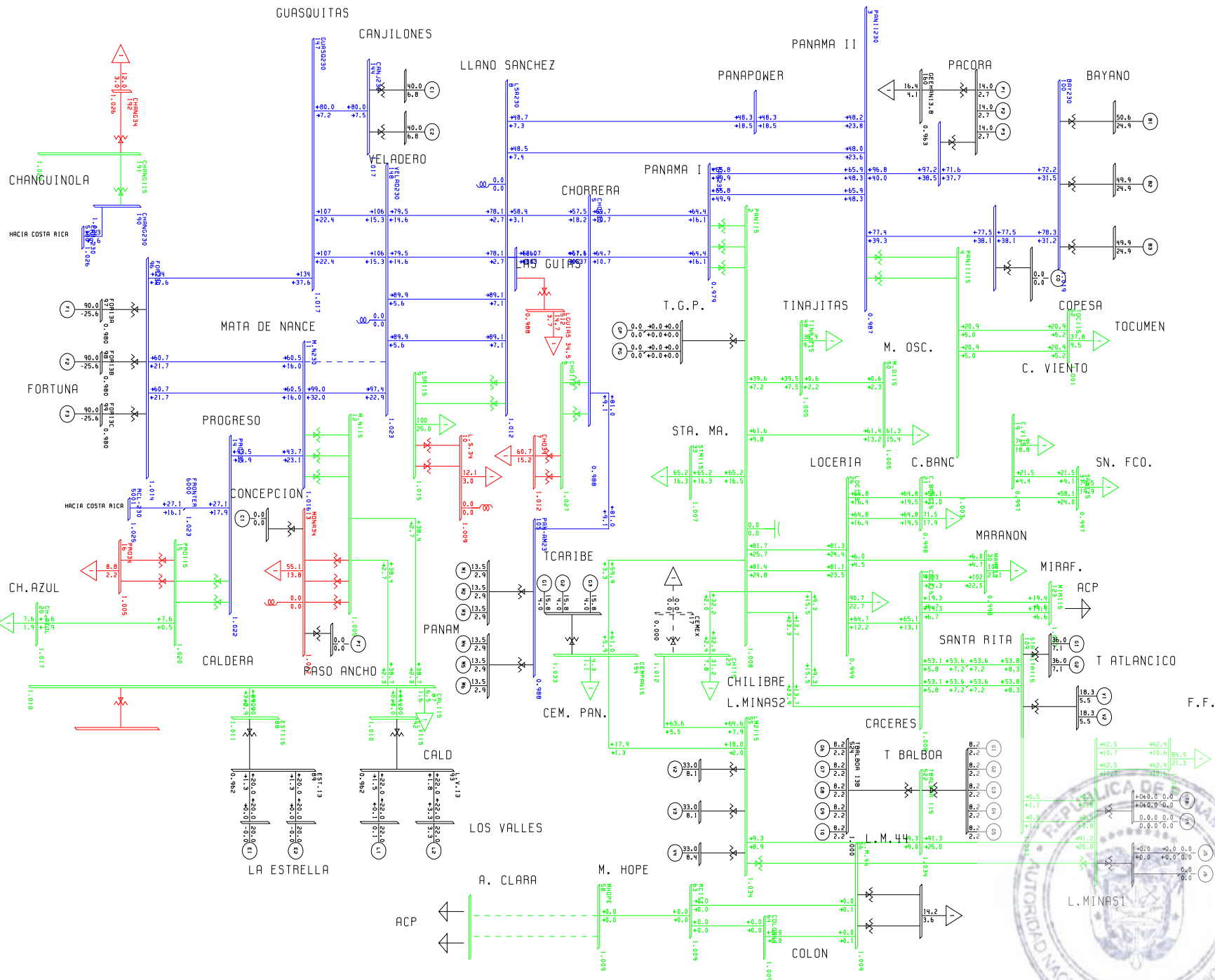


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**PLAN DE EXPANSION DEL SIN CON CENTROAMERICA JUNIO DEL 2008  
AÑO 2009 ESCENARIO MODERADO DEMANDA MAXIMA INVIERNO  
Contingencia 3: Mata de Nance - Veladero**



*de*



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### Contingencia 3: Mata de Nance - Veladero

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E THU, DEC 27 2007 14:09  
 P. EXP-SIN CON C.A. JUNIO 2008 ESC MOD DEM MAX INV  
 Año 2009 ESTUDIOS BASICOS CONT 3 MATA DE NANCE - VELADERO

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
8		LSA230		230.00	6	1.0122	232.80	11		M.N230		230.00	6	1.0161	233.71
14		PRO230		230.00	6	1.0220	235.05	96		FOR230		230.00	6	1.0137	233.16
100		BAY230		230.00	6	1.0188	234.33	144		CANJ230		230.00	6	1.0173	233.98
147		GUASQ230		230.00	6	1.0173	233.97	148		VELAD230		230.00	6	1.0228	235.24
190		CHANG230		230.00	6	1.0262	236.03	511		LGUIAS230		230.00	6	1.0033	230.77
6000		FRONTER		230.00	6	1.0231	235.31								

BUSES WITH VOLTAGE LESS THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
1		PAN230		230.00	6	0.9792	225.21	3		PANII230		230.00	6	0.9872	227.05
5		CHO230		230.00	6	0.9884	227.33	103		COPESA23		230.00	6	0.9924	228.25
105		PAN-AM23		230.00	6	0.9885	227.35	115		PACORA23		230.00	6	0.9974	229.41
515		PANPOWER230		230.00	6	0.9957	229.00								

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 PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E THU, DEC 27 2007 14:10  
 P. EXP-SIN CON C.A. JUNIO 2008 ESC MOD DEM MAX INV  
 Año 2009 ESTUDIOS BASICOS CONT 3 MATA DE NANCE - VELADERO

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2		PAN115		115.00	6	1.0083	115.95	4		PANII115		115.00	6	1.0034	115.39
6		CHO115		115.00	6	1.0266	118.06	9		LSA115		115.00	6	1.0145	116.67
12		M.N115		115.00	6	1.0050	115.57	15		PRO115		115.00	6	1.0200	117.30
18		CAC115		115.00	6	1.0078	115.90	20		CH.AZUL		115.00	6	1.0172	116.97
23		CH115		115.00	6	1.0122	116.40	33		STM115		115.00	6	1.0066	115.76
48		TINAJ115		115.00	6	1.0053	115.61	50		M.O115		115.00	6	1.0053	115.60
52		TOC115		115.00	6	1.0007	115.09	54		LM1115		115.00	6	1.0334	118.84
55		LM2115		115.00	6	1.0341	118.92	61		FFIELD		115.00	9	1.0274	118.15
87		CAL115		115.00	6	1.0096	116.11	88		EST115		115.00	6	1.0107	116.23
92		L.V115		115.00	6	1.0103	116.18	109		STA RITA115		115.00	6	1.0332	118.82
110		PTMD115A		115.00	6	1.0232	117.67	111		PTMD115B		115.00	6	1.0232	117.67
123		MIR115		115.00	7	1.0073	115.84	154		CEMPAN15		115.00	6	1.0327	118.76
191		CHANG115		115.00	6	1.0216	117.49	522		TBALBOA 115		115.00	6	1.0340	118.91

BUSES WITH VOLTAGE LESS THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
19		C.V115		115.00	6	0.9967	114.62	21		C.BAN115		115.00	6	0.9979	114.75
26		LOC115		115.00	6	0.9990	114.89	30		MAR115		115.00	6	0.9979	114.75
37		SAN115		115.00	6	0.9966	114.61								





AREA 6 [PANAMA ] MACHINE SUMMARY:																		
BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
66		BLM13B		13.800	V2	33.0	8.1	17.0	0.0	1.0000	34.0	0.9715	47.0				1	6
67		BLM13C		13.800	V3	33.0	8.1	17.0	0.0	1.0000	34.0	0.9715	47.0				1	6
68		BLM13D		13.800	V4	33.0	8.4	30.0	0.0	1.0000	34.0	0.9694	47.0				1	6
90		EST-13L		13.800	E1	20.0	0.0	12.0	-5.0	0.9600	20.8	1.0000	27.0				1	6
91		EST-13T		13.800	E2	20.0	0.0	12.0	-5.0	0.9600	20.8	1.0000	27.0				1	6
94		LV-13.8L		13.800	L1	22.0	0.1	12.0	-5.0	0.9600	22.9	1.0000	27.0				1	6
95		LV-13.8T		13.800	L2	22.0	3.3	12.0	-5.0	0.9700	22.9	0.9887	27.0				1	6
97		FOR13A		13.800	F1	90.0	-25.6	50.0	-50.0	0.9800	95.5	0.9619	111.0				1	6
98		FOR13B		13.800	F2	90.0	-25.6	50.0	-50.0	0.9800	95.5	0.9619	111.0				1	6
99		FOR13C		13.800	F3	90.0	-25.6	50.0	-50.0	0.9800	95.5	0.9619	111.0				1	6
101		BAY13A		13.800	B1	50.6	24.9	50.0	-25.0	1.0000	56.4	0.8971	96.0				1	6
102		BAY13B		13.800	B2	49.9	24.9	50.0	-25.0	1.0000	55.8	0.8951	96.0				1	6
106		PANAM13A		13.800	M1	13.5	2.9	9.0	0.0	0.9800	14.1	0.9779	20.7				1	6
106		PANAM13A		13.800	M2	13.5	2.9	9.0	0.0	0.9800	14.1	0.9779	20.7				1	6
106		PANAM13A		13.800	M3	13.5	2.9	9.0	0.0	0.9800	14.1	0.9779	20.7				1	6
107		PANAM13B		13.800	M4	13.5	2.9	9.0	0.0	0.9800	14.1	0.9779	20.7				1	6
107		PANAM13B		13.800	M5	13.5	2.9	9.0	0.0	0.9800	14.1	0.9779	20.7				1	6
107		PANAM13B		13.800	M6	13.5	2.9	9.0	0.0	0.9800	14.1	0.9779	20.7				1	6
108		BAY13C		13.800	B3	49.9	24.9	50.0	-25.0	1.0000	55.8	0.8951	100.0				1	6
116		PACORA13		13.800	P1	14.0	2.7	8.8	0.0	1.0000	14.3	0.9813	21.7				1	6
116		PACORA13		13.800	P2	14.0	2.7	8.8	0.0	1.0000	14.3	0.9813	21.7				1	6
116		PACORA13		13.800	P3	14.0	2.7	8.8	0.0	1.0000	14.3	0.9813	21.7				1	6
142		CANJ13A		13.800	C1	40.0	6.8	29.0	-29.0	0.9783	41.5	0.9860	69.0				1	6
143		CANJ13B		13.800	C2	40.0	6.8	29.0	-29.0	0.9783	41.5	0.9860	69.0				1	6
521		TCARIBE	13.813	13.800	G1	15.8	4.0	12.5	0.0	1.0000	16.3	0.9690	20.9				1	6
521		TCARIBE	13.813	13.800	G2	15.8	4.0	12.5	0.0	1.0000	16.3	0.9690	20.9				1	6
521		TCARIBE	13.813	13.800	G3	15.8	4.0	12.5	0.0	1.0000	16.3	0.9690	20.9				1	6
523		TBALBOA	13A	13.800	G1	8.2	2.2	6.6	-6.6	1.0000	8.5	0.9666	10.9				1	6
523		TBALBOA	13A	13.800	G2	8.2	2.2	6.6	-6.6	1.0000	8.5	0.9666	10.9				1	6
523		TBALBOA	13A	13.800	G3	8.2	2.2	6.6	-6.6	1.0000	8.5	0.9666	10.9				1	6
523		TBALBOA	13A	13.800	G4	8.2	2.2	6.6	-6.6	1.0000	8.5	0.9666	10.9				1	6
523		TBALBOA	13A	13.800	G5	8.2	2.2	6.6	-6.6	1.0000	8.5	0.9666	10.9				1	6
524		TBALBOA	13B	13.800	10	8.2	2.2	6.6	-6.6	1.0000	8.5	0.9666	10.9				1	6
524		TBALBOA	13B	13.800	G6	8.2	2.2	6.6	-6.6	1.0000	8.5	0.9666	10.9				1	6
524		TBALBOA	13B	13.800	G7	8.2	2.2	6.6	-6.6	1.0000	8.5	0.9666	10.9				1	6
524		TBALBOA	13B	13.800	G8	8.2	2.2	6.6	-6.6	1.0000	8.5	0.9666	10.9				1	6
524		TBALBOA	13B	13.800	G9	8.2	2.2	6.6	-6.6	1.0000	8.5	0.9666	10.9				1	6
525		TATLANTIC13A13	13.800	G1	36.0	7.1	28.5	0.0	1.0000	36.7	0.9811	47.5				1	6	
525		TATLANTIC13A13	13.800	G2	36.0	7.1	28.5	0.0	1.0000	36.7	0.9811	47.5				1	6	
526		TATLANTIC13B13	13.800	V1	18.3	5.5	15.0	0.0	1.0000	19.1	0.9574	25.0				1	6	
526		TATLANTIC13B13	13.800	V2	18.3	5.5	15.0	0.0	1.0000	19.1	0.9574	25.0				1	6	
SUBSYSTEM TOTALS						1044.5	123.9	740.6	-368.6				1518.1					

AREA 7 [ACANAL ] MACHINE SUMMARY:																		
BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
126		MIR13A		12.000	G1	8.6	0.0	5.0	0.0	1.0471	8.2	1.0000	13.5				2	



*Handwritten signature or initials.*

127	MIR13B	12.000	G2	8.6	0.0	5.0	0.0	1.0471	8.2	1.0000	13.5	2	7
130	MIR13F	13.800	G5	9.7	4.5	8.0	0.0	1.0000	10.7	0.9049	27.7	2	7
134	MAD6A	6.9000	G1	9.7	1.0	6.0	-6.0	1.0000	9.7	0.9946	13.0	2	7
135	MAD6B	6.9000	G2	9.7	1.0	6.0	-6.0	1.0000	9.7	0.9947	13.0	2	7
136	MAD6C	6.9000	G3	9.7	1.0	6.0	-6.0	1.0000	9.7	0.9947	13.0	2	7
140	GAT6A	6.9000	G1	1.9	0.0	2.0	-2.0	1.0000	1.9	0.9997	4.1	2	7
140	GAT6A	6.9000	G2	1.9	0.0	2.0	-2.0	1.0000	1.9	0.9997	4.1	2	7
140	GAT6A	6.9000	G3	1.9	0.0	2.0	-2.0	1.0000	1.9	0.9997	4.1	2	7
141	GAT6B	6.9000	G4	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9846	5.6	2	7
141	GAT6B	6.9000	G5	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9846	6.2	2	7
141	GAT6B	6.9000	G6	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9846	6.2	2	7
SUBSYSTEM TOTALS				73.3	5.7	51.0	-33.0				124.2		



*Handwritten signature or initials.*

**PLAN DE EXPANSION DEL SIN CON CENTROAMERICA JUNIO DEL 2008**  
**AÑO 2009 ESCENARIO MODERADO DEMANDA MAXIMA INVIERNO**  
**Contingencia 4: Panamá - Cemento Panamá**

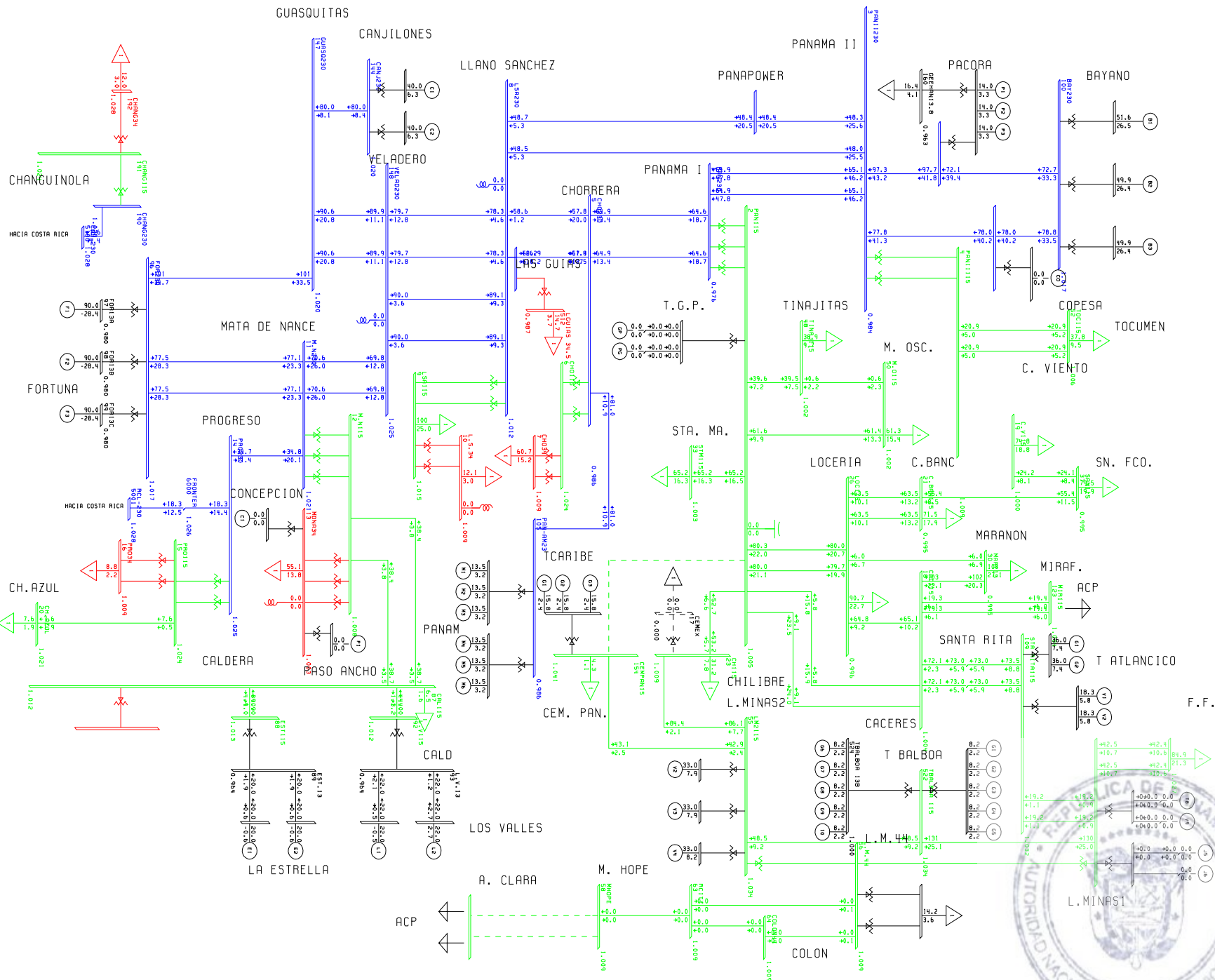


*de*

P. EXP-SIN CON C.A.R. JUNIO 2008 ESC. MOD. DEM. MAX. INV.  
 R. 0 2009 ESTUDIOS BASICOS CONT 4 PMR - CEMENTO PMR  
 18:39

KY: 514 . 535 . 5115

BUS - VOLTAGE (PU)  
 BRANCH - MV/MVAR  
 EQUIPMENT - MV/MVAR



Handwritten signature or initials.

## Contingencia 4: Panamá – Cemento Panamá

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
 P. EXP-SIN CON C.A. JUNIO 2008 ESC MOD DEM MAX INV  
 Año 2009 ESTUDIOS BASICOS CONT 4 PMA - CEMENTO PMA

THU, DEC 27 2007 14:15

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
8		LSA230		230.00	6	1.0124	232.84	11		M.N230		230.00	6	1.0205	234.72
14		PRO230		230.00	6	1.0255	235.86	96		FOR230		230.00	6	1.0169	233.89
100		BAY230		230.00	6	1.0168	233.86	144		CANJ230		230.00	6	1.0205	234.70
147		GUASQ230		230.00	6	1.0204	234.70	148		VELAD230		230.00	6	1.0251	235.77
190		CHANG230		230.00	6	1.0282	236.49	511		LGUIAS230		230.00	6	1.0025	230.57
6000		FRONTER		230.00	6	1.0264	236.08								

BUSES WITH VOLTAGE LESS THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
1		PAN230		230.00	6	0.9759	224.46	3		PANII230		230.00	6	0.9837	226.25
5		CHO230		230.00	6	0.9861	226.81	103		COPESA23		230.00	6	0.9891	227.49
105		PAN-AM23		230.00	6	0.9862	226.83	115		PACORA23		230.00	6	0.9945	228.74
515		PANPOWER230		230.00	6	0.9928	228.34								

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
 P. EXP-SIN CON C.A. JUNIO 2008 ESC MOD DEM MAX INV  
 Año 2009 ESTUDIOS BASICOS CONT 4 PMA - CEMENTO PMA

THU, DEC 27 2007 14:15

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2		PAN115		115.00	6	1.0047	115.54	4		PANII115		115.00	6	1.0088	116.02
6		CHO115		115.00	6	1.0241	117.78	9		LSA115		115.00	6	1.0147	116.69
12		M.N115		115.00	6	1.0083	115.95	15		PRO115		115.00	6	1.0236	117.71
18		CAC115		115.00	6	1.0043	115.50	20		CH.AZUL		115.00	6	1.0207	117.38
23		CH115		115.00	6	1.0092	116.06	33		STM115		115.00	6	1.0030	115.35
48		TINAJ115		115.00	6	1.0017	115.20	50		M.O115		115.00	6	1.0016	115.19
52		TOC115		115.00	6	1.0062	115.72	54		LM1115		115.00	6	1.0333	118.83
55		LM2115		115.00	6	1.0343	118.95	61		FFIELD		115.00	9	1.0273	118.14
87		CAL115		115.00	6	1.0118	116.36	88		EST115		115.00	6	1.0127	116.46
92		L.V115		115.00	6	1.0124	116.42	109		STA RITA115		115.00	6	1.0323	118.71
110		PTMD115A		115.00	6	1.0209	117.41	111		PTMD115B		115.00	6	1.0209	117.41
123		MIR115		115.00	7	1.0040	115.46	154		CEMPAN15		115.00	6	1.0409	119.70
191		CHANG115		115.00	6	1.0237	117.72	522		TBALBOA 115		115.00	6	1.0340	118.91

BUSES WITH VOLTAGE LESS THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
19		C.V115		115.00	6	0.9997	114.96	21		C.BAN115		115.00	6	0.9954	114.47
26		LOC115		115.00	6	0.9963	114.58	30		MAR115		115.00	6	0.9947	114.39
37		SAN115		115.00	6	0.9946	114.38								



AREA 6 [PANAMA ] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
66		BLM13B		13.800	V2	33.0	7.9	17.0	0.0	1.0000	33.9	0.9722	47.0			1	6	
67		BLM13C		13.800	V3	33.0	7.9	17.0	0.0	1.0000	33.9	0.9722	47.0			1	6	
68		BLM13D		13.800	V4	33.0	8.2	30.0	0.0	1.0000	34.0	0.9703	47.0			1	6	
90		EST-13L		13.800	E1	20.0	-0.6	12.0	-5.0	0.9600	20.8	0.9996	27.0			1	6	
91		EST-13T		13.800	E2	20.0	-0.6	12.0	-5.0	0.9600	20.8	0.9996	27.0			1	6	
94		LV-13.8L		13.800	L1	22.0	-0.5	12.0	-5.0	0.9600	22.9	0.9997	27.0			1	6	
95		LV-13.8T		13.800	L2	22.0	2.7	12.0	-5.0	0.9700	22.9	0.9923	27.0			1	6	
97		FOR13A		13.800	F1	90.0	-28.4	50.0	-50.0	0.9800	96.3	0.9536	111.0			1	6	
98		FOR13B		13.800	F2	90.0	-28.4	50.0	-50.0	0.9800	96.3	0.9536	111.0			1	6	
99		FOR13C		13.800	F3	90.0	-28.4	50.0	-50.0	0.9800	96.3	0.9536	111.0			1	6	
101		BAY13A		13.800	B1	51.6	26.5	50.0	-25.0	1.0000	58.0	0.8896	96.0			1	6	SYST
102		BAY13B		13.800	B2	49.9	26.4	50.0	-25.0	1.0000	56.5	0.8841	96.0			1	6	
106		PANAM13A		13.800	M1	13.5	3.2	9.0	0.0	0.9800	14.2	0.9730	20.7			1	6	
106		PANAM13A		13.800	M2	13.5	3.2	9.0	0.0	0.9800	14.2	0.9730	20.7			1	6	
106		PANAM13A		13.800	M3	13.5	3.2	9.0	0.0	0.9800	14.2	0.9730	20.7			1	6	
107		PANAM13B		13.800	M4	13.5	3.2	9.0	0.0	0.9800	14.2	0.9730	20.7			1	6	
107		PANAM13B		13.800	M5	13.5	3.2	9.0	0.0	0.9800	14.2	0.9730	20.7			1	6	
107		PANAM13B		13.800	M6	13.5	3.2	9.0	0.0	0.9800	14.2	0.9730	20.7			1	6	
108		BAY13C		13.800	B3	49.9	26.4	50.0	-25.0	1.0000	56.5	0.8841	100.0			1	6	
116		PACORA13		13.800	P1	14.0	3.3	8.8	0.0	1.0000	14.4	0.9738	21.7			1	6	
116		PACORA13		13.800	P2	14.0	3.3	8.8	0.0	1.0000	14.4	0.9738	21.7			1	6	
116		PACORA13		13.800	P3	14.0	3.3	8.8	0.0	1.0000	14.4	0.9738	21.7			1	6	
142		CANJ13A		13.800	C1	40.0	6.3	29.0	-29.0	0.9783	41.4	0.9880	69.0			1	6	
143		CANJ13B		13.800	C2	40.0	6.3	29.0	-29.0	0.9783	41.4	0.9880	69.0			1	6	
521		TCARIBE	13.813	800	G1	15.8	2.4	12.5	0.0	1.0000	16.0	0.9886	20.9			1	6	
521		TCARIBE	13.813	800	G2	15.8	2.4	12.5	0.0	1.0000	16.0	0.9886	20.9			1	6	
521		TCARIBE	13.813	800	G3	15.8	2.4	12.5	0.0	1.0000	16.0	0.9886	20.9			1	6	
523		TBALBOA	13A	13.800	G1	8.2	2.2	6.6	-6.6	1.0000	8.5	0.9668	10.9			1	6	
523		TBALBOA	13A	13.800	G2	8.2	2.2	6.6	-6.6	1.0000	8.5	0.9668	10.9			1	6	
523		TBALBOA	13A	13.800	G3	8.2	2.2	6.6	-6.6	1.0000	8.5	0.9668	10.9			1	6	
523		TBALBOA	13A	13.800	G4	8.2	2.2	6.6	-6.6	1.0000	8.5	0.9668	10.9			1	6	
523		TBALBOA	13A	13.800	G5	8.2	2.2	6.6	-6.6	1.0000	8.5	0.9668	10.9			1	6	
524		TBALBOA	13B	13.800	10	8.2	2.2	6.6	-6.6	1.0000	8.5	0.9668	10.9			1	6	
524		TBALBOA	13B	13.800	G6	8.2	2.2	6.6	-6.6	1.0000	8.5	0.9668	10.9			1	6	
524		TBALBOA	13B	13.800	G7	8.2	2.2	6.6	-6.6	1.0000	8.5	0.9668	10.9			1	6	
524		TBALBOA	13B	13.800	G8	8.2	2.2	6.6	-6.6	1.0000	8.5	0.9668	10.9			1	6	
524		TBALBOA	13B	13.800	G9	8.2	2.2	6.6	-6.6	1.0000	8.5	0.9668	10.9			1	6	
525		TATLANTIC13A13	800	G1	36.0	7.4	28.5	0.0	1.0000	36.7	0.9796	47.5			1	6		
525		TATLANTIC13A13	800	G2	36.0	7.4	28.5	0.0	1.0000	36.7	0.9796	47.5			1	6		
526		TATLANTIC13B13	800	V1	18.3	5.8	15.0	0.0	1.0000	19.2	0.9533	25.0			1	6		
526		TATLANTIC13B13	800	V2	18.3	5.8	15.0	0.0	1.0000	19.2	0.9533	25.0			1	6		
SUBSYSTEM TOTALS						1045.5	116.0	740.6	-368.6				1518.1					

AREA 7 [ACANAL ] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
126		MIR13A		12.000	G1	8.6	0.0	5.0	0.0	1.0453	8.2	1.0000	13.5			2		



*Handwritten signature or initials.*

127	MIR13B	12.000	G2	8.6	0.0	5.0	0.0	1.0453	8.2	1.0000	13.5	2	7
130	MIR13F	13.800	G5	9.7	5.3	8.0	0.0	1.0000	11.0	0.8765	27.7	2	7
134	MAD6A	6.9000	G1	9.7	1.1	6.0	-6.0	1.0000	9.7	0.9935	13.0	2	7
135	MAD6B	6.9000	G2	9.7	1.1	6.0	-6.0	1.0000	9.7	0.9936	13.0	2	7
136	MAD6C	6.9000	G3	9.7	1.1	6.0	-6.0	1.0000	9.7	0.9936	13.0	2	7
140	GAT6A	6.9000	G1	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9993	4.1	2	7
140	GAT6A	6.9000	G2	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9993	4.1	2	7
140	GAT6A	6.9000	G3	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9993	4.1	2	7
141	GAT6B	6.9000	G4	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9858	5.6	2	7
141	GAT6B	6.9000	G5	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9858	6.2	2	7
141	GAT6B	6.9000	G6	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9858	6.2	2	7
SUBSYSTEM TOTALS				73.3	6.9	51.0	-33.0				124.2		



*Handwritten signature or initials.*

**PLAN DE EXPANSION DEL SIN CON CENTROAMERICA JUNIO DEL 2008  
AÑO 2009 ESCENARIO MODERADO DEMANDA MAXIMA INVIERNO  
Contingencia 5: Minas 2 - Chilibre**



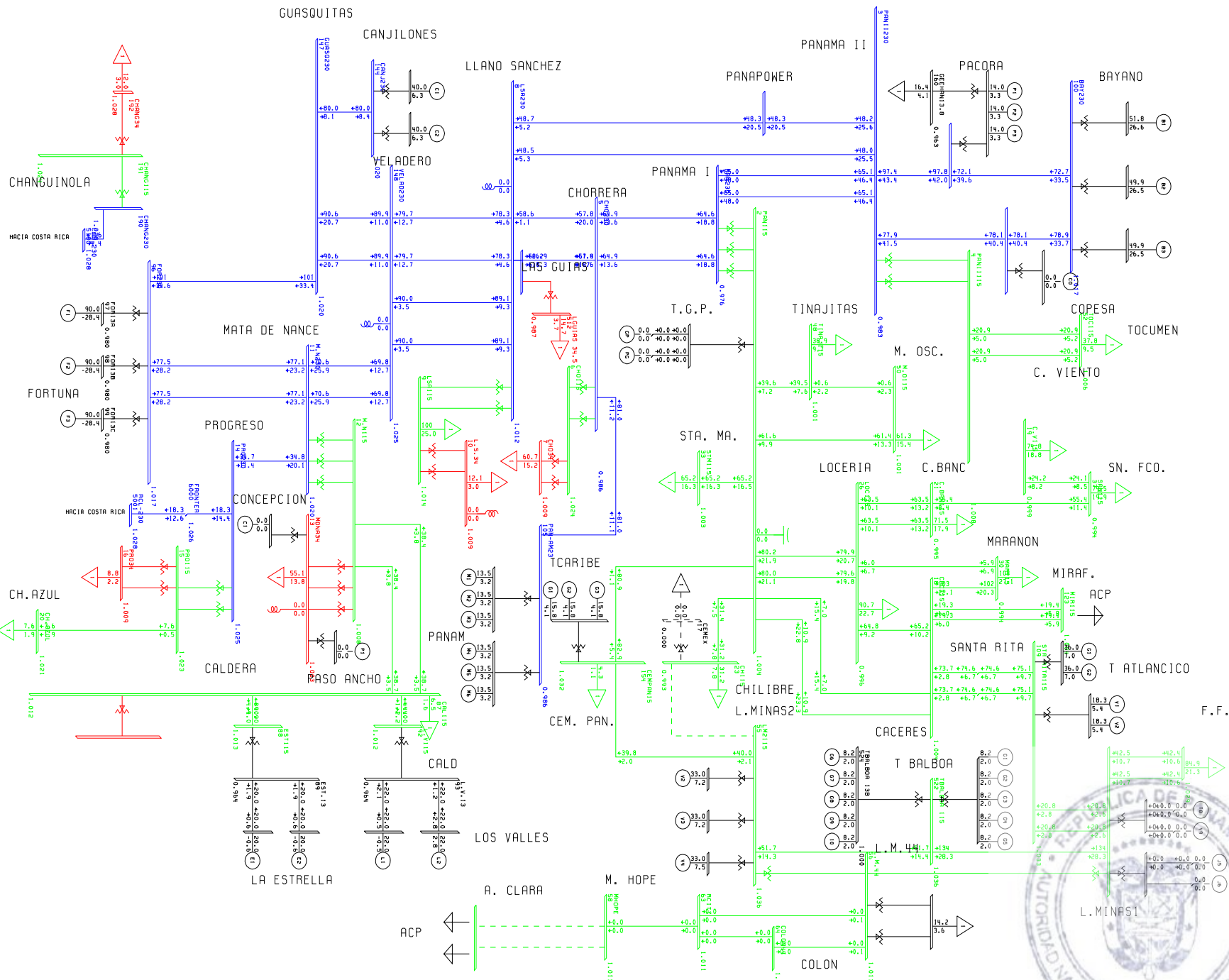
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P. EXP-SIN CON C.A.R. JUNIO 2008 ESC MOD DEM MAX INV  
 R 0 2009 ESTUDIOS B STICOS CONT 5 MINAS 2 - CHILIBRE  
 18:41

KV: 514 . \*35 . 5115

BUS - VOLTAGE (PU)  
 BRANCH - MW/MVAR  
 EQUIPMENT - MW/MVAR



*Handwritten signature or initials.*

## Contingencia 5: Minas 2 - Chilibre

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
 P. EXP-SIN CON C.A. JUNIO 2008 ESC MOD DEM MAX INV  
 AÑO 2009 ESTUDIOS BÁSICOS CONT 5 MINAS 2 - CHILIBRE

THU, DEC 27 2007 14:20

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
8		LSA230		230.00	6	1.0122	232.80	11		M.N230		230.00	6	1.0204	234.70
14		PRO230		230.00	6	1.0254	235.84	96		FOR230		230.00	6	1.0169	233.88
100		BAY230		230.00	6	1.0166	233.83	144		CANJ230		230.00	6	1.0204	234.69
147		GUASQ230		230.00	6	1.0204	234.68	148		VELAD230		230.00	6	1.0250	235.74
190		CHANG230		230.00	6	1.0282	236.48	511		LGUIAS230		230.00	6	1.0023	230.52
6000		FRONTER		230.00	6	1.0264	236.06								

BUSES WITH VOLTAGE LESS THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
1		PAN230		230.00	6	0.9756	224.39	3		PANII230		230.00	6	0.9834	226.18
5		CHO230		230.00	6	0.9859	226.75	103		COPESA23		230.00	6	0.9888	227.43
105		PAN-AM23		230.00	6	0.9860	226.77	115		PACORA23		230.00	6	0.9943	228.68
515		PANPOWER230		230.00	6	0.9925	228.28								

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
 P. EXP-SIN CON C.A. JUNIO 2008 ESC MOD DEM MAX INV  
 AÑO 2009 ESTUDIOS BÁSICOS CONT 5 MINAS 2 - CHILIBRE

THU, DEC 27 2007 14:20

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2		PAN115		115.00	6	1.0043	115.49	4		PANII115		115.00	6	1.0085	115.98
6		CHO115		115.00	6	1.0238	117.74	9		LSA115		115.00	6	1.0145	116.67
12		M.N115		115.00	6	1.0082	115.95	15		PRO115		115.00	6	1.0235	117.70
18		CAC115		115.00	6	1.0039	115.45	20		CH.AZUL		115.00	6	1.0206	117.37
33		STM115		115.00	6	1.0026	115.30	48		TINAJ115		115.00	6	1.0013	115.15
50		M.O115		115.00	6	1.0012	115.14	52		TOC115		115.00	6	1.0059	115.68
54		LM1115		115.00	6	1.0349	119.02	55		LM2115		115.00	6	1.0360	119.14
61		FFIELD		115.00	9	1.0289	118.33	87		CAL115		115.00	6	1.0118	116.35
88		EST115		115.00	6	1.0126	116.45	92		L.V115		115.00	6	1.0123	116.42
109		STA RITA115		115.00	6	1.0335	118.85	110		PTMD115A		115.00	6	1.0214	117.46
111		PTMD115B		115.00	6	1.0214	117.46	123		MIR115		115.00	7	1.0036	115.42
154		CEMPAN15		115.00	6	1.0322	118.70	191		CHANG115		115.00	6	1.0236	117.72
522		TBALBOA 115		115.00	6	1.0357	119.11								

BUSES WITH VOLTAGE LESS THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
19		C.V115		115.00	6	0.9993	114.92	21		C.BAN115		115.00	6	0.9950	114.42
23		CH115		115.00	6	0.9932	114.22	26		LOC115		115.00	6	0.9959	114.53
30		MAR115		115.00	6	0.9943	114.35	37		SAN115		115.00	6	0.9942	114.34



AREA 6 [PANAMA ] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
66		BLM13B		13.800	V2	33.0	7.2	17.0	0.0	1.0000	33.8	0.9769	47.0			1	6	
67		BLM13C		13.800	V3	33.0	7.2	17.0	0.0	1.0000	33.8	0.9769	47.0			1	6	
68		BLM13D		13.800	V4	33.0	7.5	30.0	0.0	1.0000	33.8	0.9754	47.0			1	6	
90		EST-13L		13.800	E1	20.0	-0.6	12.0	-5.0	0.9600	20.8	0.9996	27.0			1	6	
91		EST-13T		13.800	E2	20.0	-0.6	12.0	-5.0	0.9600	20.8	0.9996	27.0			1	6	
94		LV-13.8L		13.800	L1	22.0	-0.5	12.0	-5.0	0.9600	22.9	0.9997	27.0			1	6	
95		LV-13.8T		13.800	L2	22.0	2.8	12.0	-5.0	0.9700	22.9	0.9923	27.0			1	6	
97		FOR13A		13.800	F1	90.0	-28.4	50.0	-50.0	0.9800	96.3	0.9538	111.0			1	6	
98		FOR13B		13.800	F2	90.0	-28.4	50.0	-50.0	0.9800	96.3	0.9538	111.0			1	6	
99		FOR13C		13.800	F3	90.0	-28.4	50.0	-50.0	0.9800	96.3	0.9538	111.0			1	6	
101		BAY13A		13.800	B1	51.8	26.6	50.0	-25.0	1.0000	58.2	0.8892	96.0			1	6	SYST
102		BAY13B		13.800	B2	49.9	26.5	50.0	-25.0	1.0000	56.5	0.8832	96.0			1	6	
106		PANAM13A		13.800	M1	13.5	3.2	9.0	0.0	0.9800	14.2	0.9724	20.7			1	6	
106		PANAM13A		13.800	M2	13.5	3.2	9.0	0.0	0.9800	14.2	0.9724	20.7			1	6	
106		PANAM13A		13.800	M3	13.5	3.2	9.0	0.0	0.9800	14.2	0.9724	20.7			1	6	
107		PANAM13B		13.800	M4	13.5	3.2	9.0	0.0	0.9800	14.2	0.9724	20.7			1	6	
107		PANAM13B		13.800	M5	13.5	3.2	9.0	0.0	0.9800	14.2	0.9724	20.7			1	6	
107		PANAM13B		13.800	M6	13.5	3.2	9.0	0.0	0.9800	14.2	0.9724	20.7			1	6	
108		BAY13C		13.800	B3	49.9	26.5	50.0	-25.0	1.0000	56.5	0.8832	100.0			1	6	
116		PACORA13		13.800	P1	14.0	3.3	8.8	0.0	1.0000	14.4	0.9731	21.7			1	6	
116		PACORA13		13.800	P2	14.0	3.3	8.8	0.0	1.0000	14.4	0.9731	21.7			1	6	
116		PACORA13		13.800	P3	14.0	3.3	8.8	0.0	1.0000	14.4	0.9731	21.7			1	6	
142		CANJ13A		13.800	C1	40.0	6.3	29.0	-29.0	0.9783	41.4	0.9879	69.0			1	6	
143		CANJ13B		13.800	C2	40.0	6.3	29.0	-29.0	0.9783	41.4	0.9879	69.0			1	6	
521		TCARIBE	13.813	800	G1	15.8	4.1	12.5	0.0	1.0000	16.3	0.9675	20.9			1	6	
521		TCARIBE	13.813	800	G2	15.8	4.1	12.5	0.0	1.0000	16.3	0.9675	20.9			1	6	
521		TCARIBE	13.813	800	G3	15.8	4.1	12.5	0.0	1.0000	16.3	0.9675	20.9			1	6	
523		TBALBOA	13A	13.800	G1	8.2	2.0	6.6	-6.6	1.0000	8.4	0.9724	10.9			1	6	
523		TBALBOA	13A	13.800	G2	8.2	2.0	6.6	-6.6	1.0000	8.4	0.9724	10.9			1	6	
523		TBALBOA	13A	13.800	G3	8.2	2.0	6.6	-6.6	1.0000	8.4	0.9724	10.9			1	6	
523		TBALBOA	13A	13.800	G4	8.2	2.0	6.6	-6.6	1.0000	8.4	0.9724	10.9			1	6	
523		TBALBOA	13A	13.800	G5	8.2	2.0	6.6	-6.6	1.0000	8.4	0.9724	10.9			1	6	
524		TBALBOA	13B	13.800	10	8.2	2.0	6.6	-6.6	1.0000	8.4	0.9724	10.9			1	6	
524		TBALBOA	13B	13.800	G6	8.2	2.0	6.6	-6.6	1.0000	8.4	0.9724	10.9			1	6	
524		TBALBOA	13B	13.800	G7	8.2	2.0	6.6	-6.6	1.0000	8.4	0.9724	10.9			1	6	
524		TBALBOA	13B	13.800	G8	8.2	2.0	6.6	-6.6	1.0000	8.4	0.9724	10.9			1	6	
524		TBALBOA	13B	13.800	G9	8.2	2.0	6.6	-6.6	1.0000	8.4	0.9724	10.9			1	6	
525		TATLANTIC13A13	800	G1	36.0	7.0	28.5	0.0	1.0000	36.7	0.9816	47.5			1	6		
525		TATLANTIC13A13	800	G2	36.0	7.0	28.5	0.0	1.0000	36.7	0.9816	47.5			1	6		
526		TATLANTIC13B13	800	V1	18.3	5.4	15.0	0.0	1.0000	19.1	0.9586	25.0			1	6		
526		TATLANTIC13B13	800	V2	18.3	5.4	15.0	0.0	1.0000	19.1	0.9586	25.0			1	6		
SUBSYSTEM TOTALS						1045.6	116.4	740.6	-368.6				1518.1					

AREA 7 [ACANAL ] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
126		MIR13A		12.000	G1	8.6	0.0	5.0	0.0	1.0451	8.2	1.0000	13.5			2		



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127	MIR13B	12.000	G2	8.6	0.0	5.0	0.0	1.0451	8.2	1.0000	13.5	2	7
130	MIR13F	13.800	G5	9.7	5.4	8.0	0.0	1.0000	11.1	0.8732	27.7	2	7
134	MAD6A	6.9000	G1	9.7	1.1	6.0	-6.0	1.0000	9.7	0.9934	13.0	2	7
135	MAD6B	6.9000	G2	9.7	1.1	6.0	-6.0	1.0000	9.7	0.9935	13.0	2	7
136	MAD6C	6.9000	G3	9.7	1.1	6.0	-6.0	1.0000	9.7	0.9935	13.0	2	7
140	GAT6A	6.9000	G1	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9992	4.1	2	7
140	GAT6A	6.9000	G2	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9992	4.1	2	7
140	GAT6A	6.9000	G3	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9992	4.1	2	7
141	GAT6B	6.9000	G4	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9859	5.6	2	7
141	GAT6B	6.9000	G5	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9859	6.2	2	7
141	GAT6B	6.9000	G6	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9859	6.2	2	7
SUBSYSTEM TOTALS				73.3	7.0	51.0	-33.0				124.2		



*Handwritten signature or initials.*

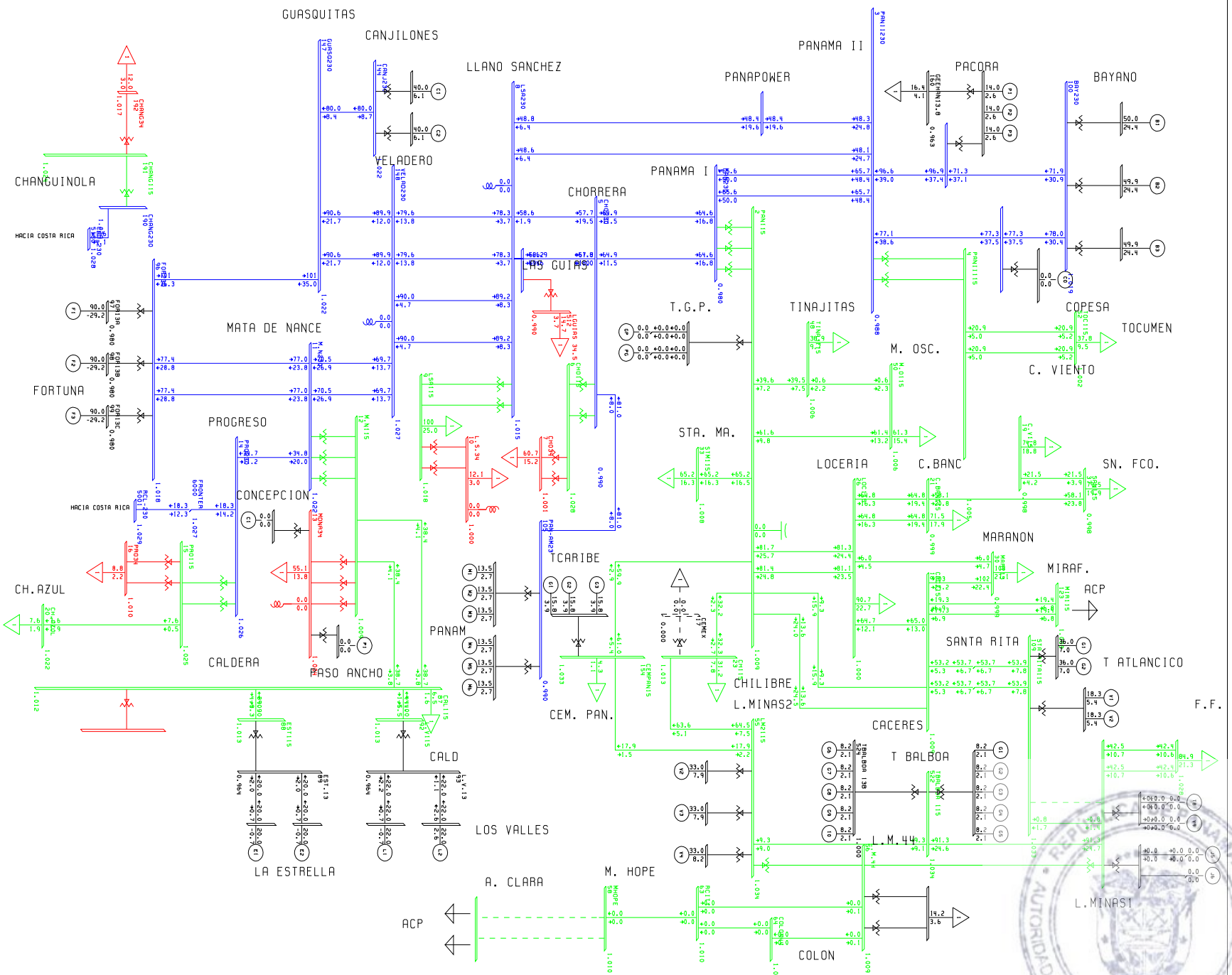
PLAN DE EXPANSION DEL SIN CON CENTROAMERICA JUNIO DEL 2008  
AÑO 2009 ESCENARIO MODERADO DEMANDA MAXIMA INVIERNO  
Contingencia 6: Minas 1 - Santa Rita



*de*

P. EXP.-SIN CON C.A. JUNIO 2008 ESC MOD MAX INV  
 R 0 2009 ESTUDIOS B SICOS CONT 6 MINAS I - SANTA RITA  
 THU, DEC 27 2007 18:48

KW:K14 . \*35 . \*115  
 BUS - VOL TAGE (PU)  
 BRANCH - MM/MVAR  
 EQUIPMENT - MM/MVAR



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## Contingencia 6: Minas 1 – Santa Rita

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E      THU, DEC 27 2007 18:48  
 P. EXP-SIN CON C.A. JUNIO 2008 ESC MOD DEM MAX INV  
 AÑO 2009 ESTUDIOS BÁSICOS CONT 6 MINAS 1 - SANTA RITA

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
8		LSA230		230.00	6	1.0152	233.50	11		M.N230		230.00	6	1.0216	234.96
14		PRO230		230.00	6	1.0264	236.07	96		FOR230		230.00	6	1.0178	234.09
100		BAY230		230.00	6	1.0195	234.48	144		CANJ230		230.00	6	1.0215	234.95
147		GUASQ230		230.00	6	1.0215	234.95	148		VELAD230		230.00	6	1.0269	236.18
190		CHANG230		230.00	6	1.0288	236.61	511		LGUIAS230		230.00	6	1.0057	231.31
6000		FRONTER		230.00	6	1.0273	236.29								

BUSES WITH VOLTAGE LESS THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
1		PAN230		230.00	6	0.9803	225.47	3		PANII230		230.00	6	0.9884	227.32
5		CHO230		230.00	6	0.9898	227.66	103		COPESA23		230.00	6	0.9935	228.50
105		PAN-AM23		230.00	6	0.9899	227.67	115		PACORA23		230.00	6	0.9984	229.63
515		PANPOWER230		230.00	6	0.9972	229.35								

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E      THU, DEC 27 2007 18:48  
 P. EXP-SIN CON C.A. JUNIO 2008 ESC MOD DEM MAX INV  
 AÑO 2009 ESTUDIOS BÁSICOS CONT 6 MINAS 1 - SANTA RITA

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2		PAN115		115.00	6	1.0093	116.07	4		PANII115		115.00	6	1.0045	115.52
6		CHO115		115.00	6	1.0280	118.22	9		LSA115		115.00	6	1.0177	117.03
12		M.N115		115.00	6	1.0091	116.04	15		PRO115		115.00	6	1.0245	117.82
18		CAC115		115.00	6	1.0088	116.02	20		CH.AZUL		115.00	6	1.0216	117.49
23		CH115		115.00	6	1.0129	116.49	26		LOC115		115.00	6	1.0001	115.01
33		STM115		115.00	6	1.0076	115.88	48		TINAJ115		115.00	6	1.0063	115.73
50		M.O115		115.00	6	1.0063	115.72	52		TOC115		115.00	6	1.0019	115.22
54		LM115		115.00	6	1.0338	118.88	55		LM2115		115.00	6	1.0344	118.96
61		FFIELD		115.00	9	1.0278	118.19	87		CAL115		115.00	6	1.0123	116.42
88		EST115		115.00	6	1.0131	116.51	92		L.V115		115.00	6	1.0129	116.48
109		STA RITA115		115.00	6	1.0335	118.85	110		PTMD115A		115.00	6	1.0238	117.74
111		PTMD115B		115.00	6	1.0238	117.74	123		MIR115		115.00	7	1.0082	115.95
154		CEMPAN15		115.00	6	1.0332	118.81	191		CHANG115		115.00	6	1.0242	117.78
522		TBALBOA 115		115.00	6	1.0343	118.95								

BUSES WITH VOLTAGE LESS THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
19		C.V115		115.00	6	0.9978	114.75	21		C.BAN115		115.00	6	0.9989	114.87
30		MAR115		115.00	6	0.9989	114.87	37		SAN115		115.00	6	0.9976	114.73



PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
 P. EXP-SIN CON C.A. JUNIO 2008 ESC MOD DEM MAX INV  
 AÑO 2009 ESTUDIOS BÁSICOS CONT 6 MINAS 1 - SANTA RITA

THU, DEC 27 2007 18:48

AREA 6 [PANAMA ] MACHINE SUMMARY:																		
BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
66		BLM13B		13.800	V2	33.0	7.9	17.0	0.0	1.0000	33.9	0.9725	47.0			1	6	
67		BLM13C		13.800	V3	33.0	7.9	17.0	0.0	1.0000	33.9	0.9725	47.0			1	6	
68		BLM13D		13.800	V4	33.0	8.2	30.0	0.0	1.0000	34.0	0.9705	47.0			1	6	
90		EST-13L		13.800	E1	20.0	-0.7	12.0	-5.0	0.9600	20.8	0.9993	27.0			1	6	
91		EST-13T		13.800	E2	20.0	-0.7	12.0	-5.0	0.9600	20.8	0.9993	27.0			1	6	
94		LV-13.8L		13.800	L1	22.0	-0.7	12.0	-5.0	0.9600	22.9	0.9995	27.0			1	6	
95		LV-13.8T		13.800	L2	22.0	2.6	12.0	-5.0	0.9700	22.8	0.9931	27.0			1	6	
97		FOR13A		13.800	F1	90.0	-29.2	50.0	-50.0	0.9800	96.5	0.9513	111.0			1	6	
98		FOR13B		13.800	F2	90.0	-29.2	50.0	-50.0	0.9800	96.5	0.9513	111.0			1	6	
99		FOR13C		13.800	F3	90.0	-29.2	50.0	-50.0	0.9800	96.5	0.9513	111.0			1	6	
101		BAY13A		13.800	B1	50.0	24.4	50.0	-25.0	1.0000	55.7	0.8989	96.0			1	6	SYST
102		BAY13B		13.800	B2	49.9	24.4	50.0	-25.0	1.0000	55.6	0.8986	96.0			1	6	
106		PANAM13A		13.800	M1	13.5	2.7	9.0	0.0	0.9800	14.0	0.9807	20.7			1	6	
106		PANAM13A		13.800	M2	13.5	2.7	9.0	0.0	0.9800	14.0	0.9807	20.7			1	6	
106		PANAM13A		13.800	M3	13.5	2.7	9.0	0.0	0.9800	14.0	0.9807	20.7			1	6	
107		PANAM13B		13.800	M4	13.5	2.7	9.0	0.0	0.9800	14.0	0.9807	20.7			1	6	
107		PANAM13B		13.800	M5	13.5	2.7	9.0	0.0	0.9800	14.0	0.9807	20.7			1	6	
107		PANAM13B		13.800	M6	13.5	2.7	9.0	0.0	0.9800	14.0	0.9807	20.7			1	6	
108		BAY13C		13.800	B3	49.9	24.4	50.0	-25.0	1.0000	55.6	0.8986	100.0			1	6	
116		PACORA13		13.800	P1	14.0	2.6	8.8	0.0	1.0000	14.2	0.9835	21.7			1	6	
116		PACORA13		13.800	P2	14.0	2.6	8.8	0.0	1.0000	14.2	0.9835	21.7			1	6	
116		PACORA13		13.800	P3	14.0	2.6	8.8	0.0	1.0000	14.2	0.9835	21.7			1	6	
142		CANJ13A		13.800	C1	40.0	6.1	29.0	-29.0	0.9783	41.4	0.9886	69.0			1	6	
143		CANJ13B		13.800	C2	40.0	6.1	29.0	-29.0	0.9783	41.4	0.9886	69.0			1	6	
521		TCARIBE	13.813	13.800	G1	15.8	3.9	12.5	0.0	1.0000	16.3	0.9703	20.9			1	6	
521		TCARIBE	13.813	13.800	G2	15.8	3.9	12.5	0.0	1.0000	16.3	0.9703	20.9			1	6	
521		TCARIBE	13.813	13.800	G3	15.8	3.9	12.5	0.0	1.0000	16.3	0.9703	20.9			1	6	
523		TBALBOA	13A	13.800	G1	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9678	10.9			1	6	
523		TBALBOA	13A	13.800	G2	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9678	10.9			1	6	
523		TBALBOA	13A	13.800	G3	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9678	10.9			1	6	
523		TBALBOA	13A	13.800	G4	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9678	10.9			1	6	
523		TBALBOA	13A	13.800	G5	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9678	10.9			1	6	
524		TBALBOA	13B	13.800	10	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9678	10.9			1	6	
524		TBALBOA	13B	13.800	G6	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9678	10.9			1	6	
524		TBALBOA	13B	13.800	G7	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9678	10.9			1	6	
524		TBALBOA	13B	13.800	G8	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9678	10.9			1	6	
524		TBALBOA	13B	13.800	G9	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9678	10.9			1	6	
525		TATLANTIC13A	13.800	G1	36.0	7.0	28.5	0.0	1.0000	36.7	0.9815	47.5			1	6		
525		TATLANTIC13A	13.800	G2	36.0	7.0	28.5	0.0	1.0000	36.7	0.9815	47.5			1	6		
526		TATLANTIC13B	13.800	V1	18.3	5.4	15.0	0.0	1.0000	19.1	0.9585	25.0			1	6		
526		TATLANTIC13B	13.800	V2	18.3	5.4	15.0	0.0	1.0000	19.1	0.9585	25.0			1	6		
SUBSYSTEM TOTALS						1043.9	104.2	740.6	-368.6				1518.1					



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PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
 P. EXP-SIN CON C.A. JUNIO 2008 ESC MOD DEM MAX INV  
 AÑO 2009 ESTUDIOS BÁSICOS CONT 6 MINAS 1 - SANTA RITA

THU, DEC 27 2007 18:48

AREA 7 [ACANAL ] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
126		MIR13A		12.000	G1	8.6	0.0	5.0	0.0	1.0476	8.2	1.0000	13.5			2	7	
127		MIR13B		12.000	G2	8.6	0.0	5.0	0.0	1.0476	8.2	1.0000	13.5			2	7	
130		MIR13F		13.800	G5	9.7	4.3	8.0	0.0	1.0000	10.6	0.9126	27.7			2	7	
134		MAD6A		6.9000	G1	9.7	1.0	6.0	-6.0	1.0000	9.7	0.9949	13.0			2	7	
135		MAD6B		6.9000	G2	9.7	1.0	6.0	-6.0	1.0000	9.7	0.9949	13.0			2	7	
136		MAD6C		6.9000	G3	9.7	1.0	6.0	-6.0	1.0000	9.7	0.9949	13.0			2	7	
140		GAT6A		6.9000	G1	1.9	0.0	2.0	-2.0	1.0000	1.9	0.9998	4.1			2	7	
140		GAT6A		6.9000	G2	1.9	0.0	2.0	-2.0	1.0000	1.9	0.9998	4.1			2	7	
140		GAT6A		6.9000	G3	1.9	0.0	2.0	-2.0	1.0000	1.9	0.9998	4.1			2	7	
141		GAT6B		6.9000	G4	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9843	5.6			2	7	
141		GAT6B		6.9000	G5	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9843	6.2			2	7	
141		GAT6B		6.9000	G6	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9843	6.2			2	7	
SUBSYSTEM TOTALS						73.3	5.3	51.0	-33.0				124.2					



*Handwritten signature or initials.*

**PLAN DE EXPANSIÓN DEL SIN CON CENTROAMÉRICA 2008  
AÑO 2010 ESCENARIO MODERADO DE DEMANDA MÁXIMA INVIERNO  
Estudios Básicos**



*de*

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
P. EXP-SIN CON C.A. JUNIO 2007  
AÑO 2010 ESTUDIOS BÁSICOS. ESC MOD DEM MAX INV

WED, DEC 26 2007 16:17

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
8		LSA230		230.00	6	1.0253	235.82	11		M.N230		230.00	6	1.0342	237.87
14		PRO230		230.00	6	1.0366	238.43	96		FOR230		230.00	6	1.0302	236.95
100		BAY230		230.00	6	1.0211	234.85	144		CANJ230		230.00	6	1.0337	237.75
147		GUASQ230		230.00	6	1.0338	237.77	148		VELAD230		230.00	6	1.0396	239.11
190		CHANG230		230.00	6	1.0364	238.36	310		CONCEPCION23		230.00	6	1.0360	238.29
511		LGUIAS230		230.00	6	1.0133	233.05	515		PANPOWER230		230.00	6	1.0005	230.11
6000		FRONTER		230.00	6	1.0371	238.54								

BUSES WITH VOLTAGE LESS THAN 1.0200:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
1		PAN230		230.00	6	0.9817	225.79	3		PANII230		230.00	6	0.9897	227.64
5		CHO230		230.00	6	0.9930	228.39	103		COPESA23		230.00	6	0.9948	228.80
105		PAN-AM23		230.00	6	0.9930	228.40	115		PACORA23		230.00	6	0.9996	229.90
511		LGUIAS230		230.00	6	1.0133	233.05	515		PANPOWER230		230.00	6	1.0005	230.11

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
P. EXP-SIN CON C.A. JUNIO 2007  
AÑO 2010 ESTUDIOS BÁSICOS. ESC MOD DEM MAX INV

WED, DEC 26 2007 16:17

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2		PAN115		115.00	6	1.0081	115.93	4		PANII115		115.00	6	1.0046	115.53
6		CHO115		115.00	6	1.0304	118.50	9		LSA115		115.00	6	1.0269	118.10
12		M.N115		115.00	6	1.0177	117.03	15		PRO115		115.00	6	1.0346	118.98
18		CAC115		115.00	6	1.0076	115.87	20		CH.AZUL		115.00	6	1.0316	118.63
23		CH115		115.00	6	1.0118	116.35	33		STM115		115.00	6	1.0063	115.72
48		TINAJ115		115.00	6	1.0049	115.56	50		M.O115		115.00	6	1.0048	115.56
52		TOC115		115.00	6	1.0018	115.21	54		LM115		115.00	6	1.0362	119.17
55		LM2115		115.00	6	1.0365	119.20	61		FFIELD		115.00	9	1.0299	118.44
87		CAL115		115.00	6	1.0182	117.09	88		EST115		115.00	6	1.0185	117.12
92		L.V115		115.00	6	1.0185	117.13	109		STA RITA115		115.00	6	1.0349	119.02
110		PTMD115A		115.00	6	1.0238	117.74	111		PTMD115B		115.00	6	1.0238	117.74
123		MIR115		115.00	7	1.0070	115.81	154		CEMPAN15		115.00	6	1.0334	118.84
191		CHANG115		115.00	6	1.0316	118.63	522		TBALBOA		115	6	1.0366	119.21

BUSES WITH VOLTAGE LESS THAN 1.0200:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2		PAN115		115.00	6	1.0081	115.93	4		PANII115		115.00	6	1.0046	115.53
12		M.N115		115.00	6	1.0177	117.03	18		CAC115		115.00	6	1.0076	115.87
19		C.V115		115.00	6	0.9971	114.67	21		C.BAN115		115.00	6	0.9972	114.68
23		CH115		115.00	6	1.0118	116.35	26		LOC115		115.00	6	0.9984	114.82
30		MAR115		115.00	6	0.9971	114.67	33		STM115		115.00	6	1.0063	115.72
37		SAN115		115.00	6	0.9960	114.54	48		TINAJ115		115.00	6	1.0049	115.56
50		M.O115		115.00	6	1.0048	115.56	52		TOC115		115.00	6	1.0018	115.21
87		CAL115		115.00	6	1.0182	117.09	88		EST115		115.00	6	1.0185	117.12
92		L.V115		115.00	6	1.0185	117.13	123		MIR115		115.00	7	1.0070	115.81



PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
P. EXP-SIN CON C.A. JUNIO 2007  
AÑO 2010 ESTUDIOS BÁSICOS. ESC MOD DEM MAX INV

WED, DEC 26 2007 16:16

AREA 6 [PANAMA ] MACHINE SUMMARY:														
BUS#	X-- NAME --X BASKV ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
66	BLM13B 13.800 V2	37.0	7.3	17.0	0.0	1.0000	37.7	0.9810	47.0				1	6
67	BLM13C 13.800 V3	37.0	7.3	17.0	0.0	1.0000	37.7	0.9810	47.0				1	6
68	BLM13D 13.800 V4	37.0	7.5	30.0	0.0	1.0000	37.8	0.9799	47.0				1	6
70	TGJB13A 13.800 J5	30.0	5.2	20.0	0.0	1.0000	30.4	0.9853	39.4				1	6
71	TGJB13B 13.800 J6	30.0	5.2	20.0	0.0	1.0000	30.4	0.9853	39.4				1	6
73	BLMCCB 13.800 V9	20.0	6.5	40.0	0.0	1.0000	21.0	0.9504	71.0				1	6
90	EST-13L 13.800 E1	22.0	-2.1	12.0	-5.0	0.9600	23.0	0.9956	27.0				1	6
91	EST-13T 13.800 E2	22.0	-2.1	12.0	-5.0	0.9600	23.0	0.9956	27.0				1	6
94	LV-13.8L 13.800 L1	24.0	-2.1	12.0	-5.0	0.9600	25.1	0.9962	27.0				1	6
95	LV-13.8T 13.800 L2	24.0	1.2	12.0	-5.0	0.9700	24.8	0.9988	27.0				1	6
97	FOR13A 13.800 F1	80.0	-41.2	50.0	-50.0	0.9800	91.8	0.8888	111.0				1	6
98	FOR13B 13.800 F2	80.0	-41.2	50.0	-50.0	0.9800	91.8	0.8888	111.0				1	6
101	BAY13A 13.800 B1	65.8	24.4	50.0	-25.0	1.0000	70.2	0.9376	96.0				1	6
102	BAY13B 13.800 B2	68.7	24.7	50.0	-25.0	1.0000	73.0	0.9412	96.0				1	6
106	PANAM13A 13.800 M1	13.5	2.3	9.0	0.0	0.9800	14.0	0.9864	20.7				1	6
106	PANAM13A 13.800 M2	13.5	2.3	9.0	0.0	0.9800	14.0	0.9864	20.7				1	6
106	PANAM13A 13.800 M3	13.5	2.3	9.0	0.0	0.9800	14.0	0.9864	20.7				1	6
107	PANAM13B 13.800 M4	13.5	2.3	9.0	0.0	0.9800	14.0	0.9864	20.7				1	6
107	PANAM13B 13.800 M5	13.5	2.3	9.0	0.0	0.9800	14.0	0.9864	20.7				1	6
107	PANAM13B 13.800 M6	13.5	2.3	9.0	0.0	0.9800	14.0	0.9864	20.7				1	6
108	BAY13C 13.800 B3	68.7	24.7	50.0	-25.0	1.0000	73.0	0.9412	100.0				1	6
116	PACORA13 13.800 P1	14.0	2.5	8.8	0.0	1.0000	14.2	0.9844	21.7				1	6
116	PACORA13 13.800 P2	14.0	2.5	8.8	0.0	1.0000	14.2	0.9844	21.7				1	6
116	PACORA13 13.800 P3	14.0	2.5	8.8	0.0	1.0000	14.2	0.9844	21.7				1	6
142	CANJ13A 13.800 C1	46.0	5.9	29.0	-29.0	0.9783	47.4	0.9920	69.0				1	6
143	CANJ13B 13.800 C2	46.0	5.9	29.0	-29.0	0.9783	47.4	0.9920	69.0				1	6
521	TCARIBE 13.813.800 G1	15.8	3.9	12.5	0.0	1.0000	16.3	0.9709	20.9				1	6
521	TCARIBE 13.813.800 G2	15.8	3.9	12.5	0.0	1.0000	16.3	0.9709	20.9				1	6
521	TCARIBE 13.813.800 G3	15.8	3.9	12.5	0.0	1.0000	16.3	0.9709	20.9				1	6
523	TBALBOA 13A 13.800 G1	8.2	1.9	6.6	-6.6	1.0000	8.4	0.9752	10.9				1	6
523	TBALBOA 13A 13.800 G2	8.2	1.9	6.6	-6.6	1.0000	8.4	0.9752	10.9				1	6
523	TBALBOA 13A 13.800 G3	8.2	1.9	6.6	-6.6	1.0000	8.4	0.9752	10.9				1	6
523	TBALBOA 13A 13.800 G4	8.2	1.9	6.6	-6.6	1.0000	8.4	0.9752	10.9				1	6
523	TBALBOA 13A 13.800 G5	8.2	1.9	6.6	-6.6	1.0000	8.4	0.9752	10.9				1	6
524	TBALBOA 13B 13.800 10	8.2	1.9	6.6	-6.6	1.0000	8.4	0.9752	10.9				1	6
524	TBALBOA 13B 13.800 G6	8.2	1.9	6.6	-6.6	1.0000	8.4	0.9752	10.9				1	6
524	TBALBOA 13B 13.800 G7	8.2	1.9	6.6	-6.6	1.0000	8.4	0.9752	10.9				1	6
524	TBALBOA 13B 13.800 G8	8.2	1.9	6.6	-6.6	1.0000	8.4	0.9752	10.9				1	6
524	TBALBOA 13B 13.800 G9	8.2	1.9	6.6	-6.6	1.0000	8.4	0.9752	10.9				1	6
525	TATLANTIC13A13.800 G1	36.0	6.6	28.5	0.0	1.0000	36.6	0.9837	47.5				1	6
525	TATLANTIC13A13.800 G2	36.0	6.6	28.5	0.0	1.0000	36.6	0.9837	47.5				1	6
526	TATLANTIC13B13.800 V1	18.3	5.0	15.0	0.0	1.0000	19.0	0.9645	25.0				1	6
526	TATLANTIC13B13.800 V2	18.3	5.0	15.0	0.0	1.0000	19.0	0.9645	25.0				1	6
SUBSYSTEM TOTALS		1099.3	111.5	770.6	-318.6				1557.0					

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
P. EXP-SIN CON C.A. JUNIO 2007  
AÑO 2010 ESTUDIOS BÁSICOS. ESC MOD DEM MAX INV

WED, DEC 26 2007 16:16

AREA 7 [ACANAL ] MACHINE SUMMARY:														
BUS#	X-- NAME --X BASKV ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING

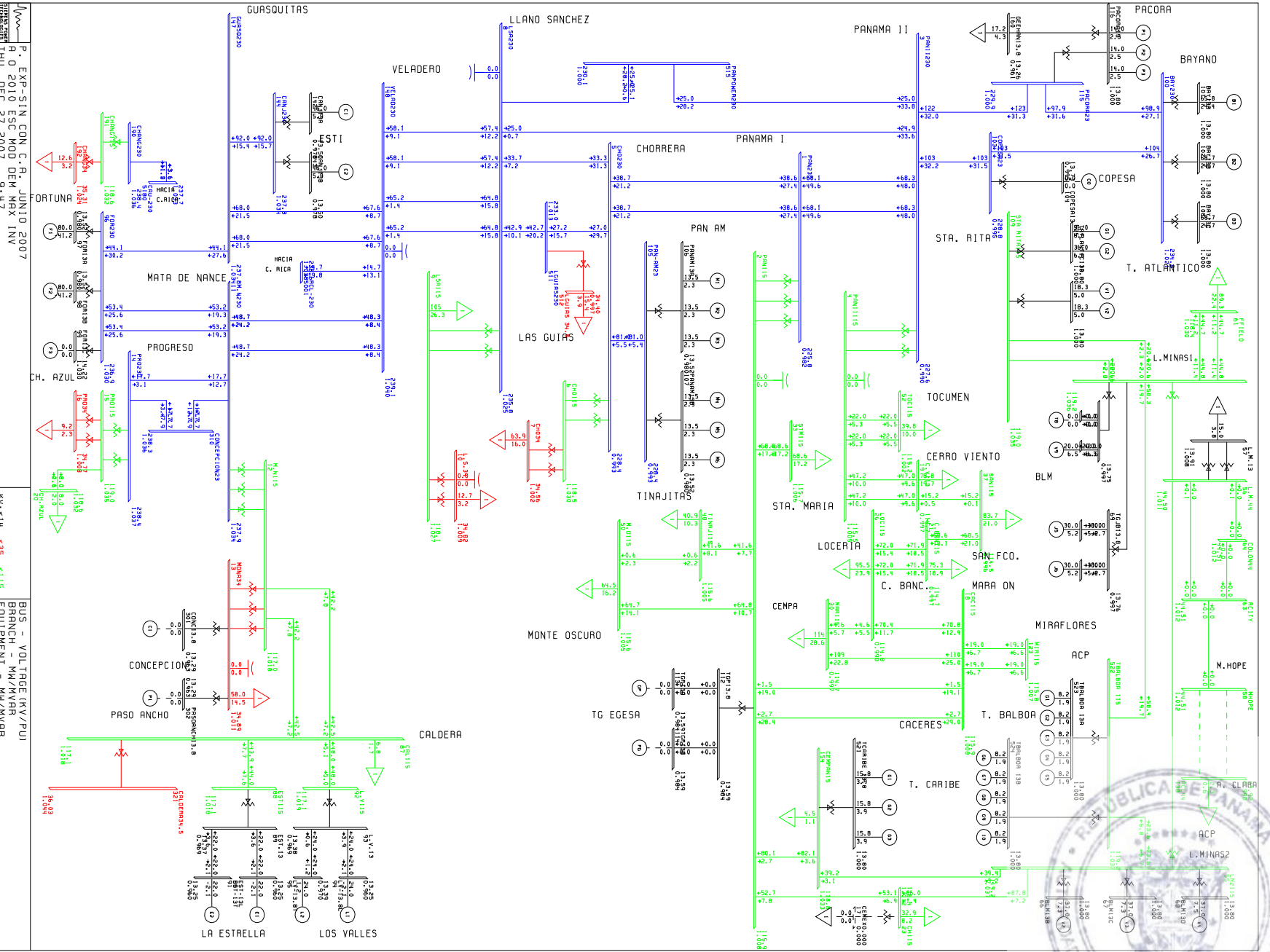


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126	MIR13A	12.000	G1	8.6	0.0	5.0	0.0	1.0467	8.2	1.0000	13.5	2	7
127	MIR13B	12.000	G2	8.6	0.0	5.0	0.0	1.0467	8.2	1.0000	13.5	2	7
130	MIR13F	13.800	G5	10.7	4.7	8.0	0.0	1.0000	11.7	0.9139	27.7	2	7
134	MAD6A	6.9000	G1	9.7	1.0	6.0	-6.0	1.0000	9.7	0.9943	13.0	2	7
135	MAD6B	6.9000	G2	9.7	1.0	6.0	-6.0	1.0000	9.7	0.9944	13.0	2	7
136	MAD6C	6.9000	G3	9.7	1.0	6.0	-6.0	1.0000	9.7	0.9944	13.0	2	7
140	GAT6A	6.9000	G1	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9995	4.1	2	7
140	GAT6A	6.9000	G2	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9995	4.1	2	7
140	GAT6A	6.9000	G3	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9995	4.1	2	7
141	GAT6B	6.9000	G4	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9853	5.6	2	7
141	GAT6B	6.9000	G5	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9853	6.2	2	7
141	GAT6B	6.9000	G6	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9853	6.2	2	7
SUBSYSTEM TOTALS				74.3	6.0	51.0	-33.0				124.2		



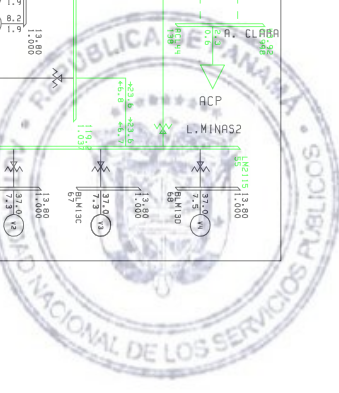
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**V**  
 P. EXP-SIN CON C-R JUNIO 2007  
 R. O 2010 ESC MOD DEM MAX INV  
 ESTACION ITHU, DEC 27 2007 9:47

KY519 .535 .5115

**BUS - VOLTAGE (KV/PU)**  
**BRANCH - MW/MVAR**  
**EQUIPMENT - MW/MVAR**



**PLAN DE EXPANSIÓN DEL SIN CON CENTROAMÉRICA 2008  
AÑO 2010 ESCENARIO MODERADO DE DEMANDA MAXIMA VERANO  
Estudios Básicos**



*de*

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E      THU, DEC 27 2007    9:00  
P. EXP-SIN CON C.A. JUNIO 2007  
AÑO 2010 ESC MOD DEM MAX VER

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V (PU)	V (KV)	BUS#	X--	NAME	--X	BASKV	AREA	V (PU)	V (KV)
8	LSA230	230.00	6	1.0295	236.78	11	M.N230	230.00	6	1.0391	239.00				
14	PRO230	230.00	6	1.0410	239.43	96	FOR230	230.00	6	1.0342	237.88				
100	BAY230	230.00	6	1.0220	235.06	115	PACORA23	230.00	6	1.0011	230.25				
144	CANJ230	230.00	6	1.0383	238.81	147	GUASQ230	230.00	6	1.0384	238.82				
148	VELAD230	230.00	6	1.0444	240.21	190	CHANG230	230.00	6	1.0389	238.95				
310	CONCEPCION23	230.00	6	1.0407	239.36	511	LGUIAS230	230.00	6	1.0167	233.84				
515	PANPOWER230	230.00	6	1.0027	230.62	6000	FRONTER	230.00	6	1.0413	239.50				

BUSES WITH VOLTAGE LESS THAN 1.0200:

BUS#	X--	NAME	--X	BASKV	AREA	V (PU)	V (KV)	BUS#	X--	NAME	--X	BASKV	AREA	V (PU)	V (KV)
1	PAN230	230.00	6	0.9834	226.18	3	PANII230	230.00	6	0.9914	228.03				
5	CHO230	230.00	6	0.9952	228.89	103	COPESA23	230.00	6	0.9964	229.16				
105	PAN-AM23	230.00	6	0.9952	228.90	115	PACORA23	230.00	6	1.0011	230.25				
511	LGUIAS230	230.00	6	1.0167	233.84	515	PANPOWER230	230.00	6	1.0027	230.62				

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E      THU, DEC 27 2007    9:01  
P. EXP-SIN CON C.A. JUNIO 2007  
AÑO 2010 ESC MOD DEM MAX VER

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V (PU)	V (KV)	BUS#	X--	NAME	--X	BASKV	AREA	V (PU)	V (KV)
2	PAN115	115.00	6	1.0089	116.02	4	PANII115	115.00	6	1.0060	115.69				
6	CHO115	115.00	6	1.0328	118.77	9	LSA115	115.00	6	1.0314	118.61				
12	M.N115	115.00	6	1.0270	118.10	15	PRO115	115.00	6	1.0390	119.49				
18	CAC115	115.00	6	1.0084	115.96	20	CH.AZUL	115.00	6	1.0360	119.14				
23	CH115	115.00	6	1.0119	116.37	33	STM115	115.00	6	1.0071	115.82				
48	TINAJ115	115.00	6	1.0057	115.66	50	M.O115	115.00	6	1.0056	115.65				
52	TOC115	115.00	6	1.0032	115.37	54	LM1115	115.00	6	1.0367	119.22				
55	LM2115	115.00	6	1.0367	119.22	61	FFIELD	115.00	9	1.0304	118.50				
87	CAL115	115.00	6	1.0250	117.88	88	EST115	115.00	6	1.0248	117.85				
92	L.V115	115.00	6	1.0251	117.89	109	STA RITA115	115.00	6	1.0352	119.05				
110	PTMD115A	115.00	6	1.0242	117.79	111	PTMD115B	115.00	6	1.0242	117.79				
123	MIR115	115.00	7	1.0078	115.89	154	CEMPAN15	115.00	6	1.0334	118.84				
191	CHANG115	115.00	6	1.0341	118.92	522	TBALBOA 115	115.00	6	1.0370	119.25				

BUSES WITH VOLTAGE LESS THAN 1.0200:

BUS#	X--	NAME	--X	BASKV	AREA	V (PU)	V (KV)	BUS#	X--	NAME	--X	BASKV	AREA	V (PU)	V (KV)
2	PAN115	115.00	6	1.0089	116.02	4	PANII115	115.00	6	1.0060	115.69				
18	CAC115	115.00	6	1.0084	115.96	19	C.V115	115.00	6	0.9983	114.81				
21	C.BAN115	115.00	6	0.9981	114.78	23	CH115	115.00	6	1.0119	116.37				
26	LOC115	115.00	6	0.9993	114.92	30	MAR115	115.00	6	0.9979	114.76				
33	STM115	115.00	6	1.0071	115.82	37	SAN115	115.00	6	0.9969	114.64				
48	TINAJ115	115.00	6	1.0057	115.66	50	M.O115	115.00	6	1.0056	115.65				
52	TOC115	115.00	6	1.0032	115.37	123	MIR115	115.00	7	1.0078	115.89				





AREA 6 [PANAMA ] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
66		BLM13B		13.800	V2	30.0	6.7	17.0	0.0	1.0000	30.7	0.9760	47.0			1	6	
67		BLM13C		13.800	V3	30.0	6.7	17.0	0.0	1.0000	30.7	0.9760	47.0			1	6	
68		BLM13D		13.800	V4	30.0	6.9	30.0	0.0	1.0000	30.8	0.9742	47.0			1	6	
70		TGJB13A		13.800	J5	30.0	5.1	20.0	0.0	1.0000	30.4	0.9859	39.4			1	6	
71		TGJB13B		13.800	J6	30.0	5.1	20.0	0.0	1.0000	30.4	0.9859	39.4			1	6	
72		BLMCCA		13.800	T8	30.0	5.5	20.0	0.0	1.0000	30.5	0.9839	50.0			1	6	
73		BLMCCB		13.800	V9	37.0	5.6	40.0	0.0	1.0000	37.4	0.9888	71.0			1	6	
90		EST-13L		13.800	E1	20.0	-4.3	12.0	-5.0	0.9600	21.3	0.9781	27.0			1	6	
94		LV-13.8L		13.800	L1	24.0	-3.9	12.0	-5.0	0.9600	25.3	0.9868	27.0			1	6	
95		LV-13.8T		13.800	L2	24.0	-0.7	12.0	-5.0	0.9700	24.8	0.9996	27.0			1	6	
97		FOR13A		13.800	F1	80.0	-44.8	50.0	-50.0	0.9800	93.6	0.8723	111.0			1	6	
98		FOR13B		13.800	F2	80.0	-44.8	50.0	-50.0	0.9800	93.6	0.8723	111.0			1	6	
101		BAY13A		13.800	B1	64.3	23.6	50.0	-25.0	1.0000	68.5	0.9388	96.0			1	6	SYST
102		BAY13B		13.800	B2	64.8	23.6	50.0	-25.0	1.0000	68.9	0.9394	96.0			1	6	
106		PANAM13A		13.800	M1	14.7	2.1	9.0	0.0	0.9800	15.1	0.9902	20.7			1	6	
106		PANAM13A		13.800	M2	14.7	2.1	9.0	0.0	0.9800	15.1	0.9902	20.7			1	6	
106		PANAM13A		13.800	M3	14.7	2.1	9.0	0.0	0.9800	15.1	0.9902	20.7			1	6	
107		PANAM13B		13.800	M4	14.7	2.1	9.0	0.0	0.9800	15.1	0.9902	20.7			1	6	
107		PANAM13B		13.800	M5	14.7	2.1	9.0	0.0	0.9800	15.1	0.9902	20.7			1	6	
107		PANAM13B		13.800	M6	14.7	2.1	9.0	0.0	0.9800	15.1	0.9902	20.7			1	6	
108		BAY13C		13.800	B3	64.8	23.6	50.0	-25.0	1.0000	68.9	0.9394	100.0			1	6	
116		PACORA13		13.800	P1	16.7	2.4	8.8	0.0	1.0000	16.9	0.9901	21.7			1	6	
116		PACORA13		13.800	P2	16.7	2.4	8.8	0.0	1.0000	16.9	0.9901	21.7			1	6	
116		PACORA13		13.800	P3	16.7	2.4	8.8	0.0	1.0000	16.9	0.9901	21.7			1	6	
142		CANJ13A		13.800	C1	35.0	2.2	29.0	-29.0	0.9783	35.8	0.9980	69.0			1	6	
143		CANJ13B		13.800	C2	35.0	2.2	29.0	-29.0	0.9783	35.8	0.9980	69.0			1	6	
301		CONC13.8		13.800	C1	9.2	5.0	5.0	-5.0	0.9604	10.9	0.8784	13.5			1	6	
302		PASOANCH13.8		13.800	P1	4.4	2.0	2.0	-2.0	0.9585	5.1	0.9110	6.2			1	6	
521		TCARIBE	13.813	13.800	G1	15.8	3.9	12.5	0.0	1.0000	16.3	0.9710	20.9			1	6	
521		TCARIBE	13.813	13.800	G2	15.8	3.9	12.5	0.0	1.0000	16.3	0.9710	20.9			1	6	
521		TCARIBE	13.813	13.800	G3	15.8	3.9	12.5	0.0	1.0000	16.3	0.9710	20.9			1	6	
523		TBALBOA	13A	13.800	G1	8.2	1.8	6.6	-6.6	1.0000	8.4	0.9763	10.9			1	6	
523		TBALBOA	13A	13.800	G2	8.2	1.8	6.6	-6.6	1.0000	8.4	0.9763	10.9			1	6	
523		TBALBOA	13A	13.800	G3	8.2	1.8	6.6	-6.6	1.0000	8.4	0.9763	10.9			1	6	
523		TBALBOA	13A	13.800	G4	8.2	1.8	6.6	-6.6	1.0000	8.4	0.9763	10.9			1	6	
523		TBALBOA	13A	13.800	G5	8.2	1.8	6.6	-6.6	1.0000	8.4	0.9763	10.9			1	6	
524		TBALBOA	13B	13.800	10	8.2	1.8	6.6	-6.6	1.0000	8.4	0.9763	10.9			1	6	
524		TBALBOA	13B	13.800	G6	8.2	1.8	6.6	-6.6	1.0000	8.4	0.9763	10.9			1	6	
524		TBALBOA	13B	13.800	G7	8.2	1.8	6.6	-6.6	1.0000	8.4	0.9763	10.9			1	6	
524		TBALBOA	13B	13.800	G8	8.2	1.8	6.6	-6.6	1.0000	8.4	0.9763	10.9			1	6	
524		TBALBOA	13B	13.800	G9	8.2	1.8	6.6	-6.6	1.0000	8.4	0.9763	10.9			1	6	
525		TATLANTIC13A	13.800	G1	36.0	6.5	28.5	0.0	1.0000	36.6	0.9841	47.5			1	6		
525		TATLANTIC13A	13.800	G2	36.0	6.5	28.5	0.0	1.0000	36.6	0.9841	47.5			1	6		
526		TATLANTIC13B	13.800	V1	18.3	4.9	15.0	0.0	1.0000	19.0	0.9656	25.0			1	6		
526		TATLANTIC13B	13.800	V2	18.3	4.9	15.0	0.0	1.0000	19.0	0.9656	25.0			1	6		
SUBSYSTEM TOTALS						1098.7	97.5	785.6	-320.6				1599.8					



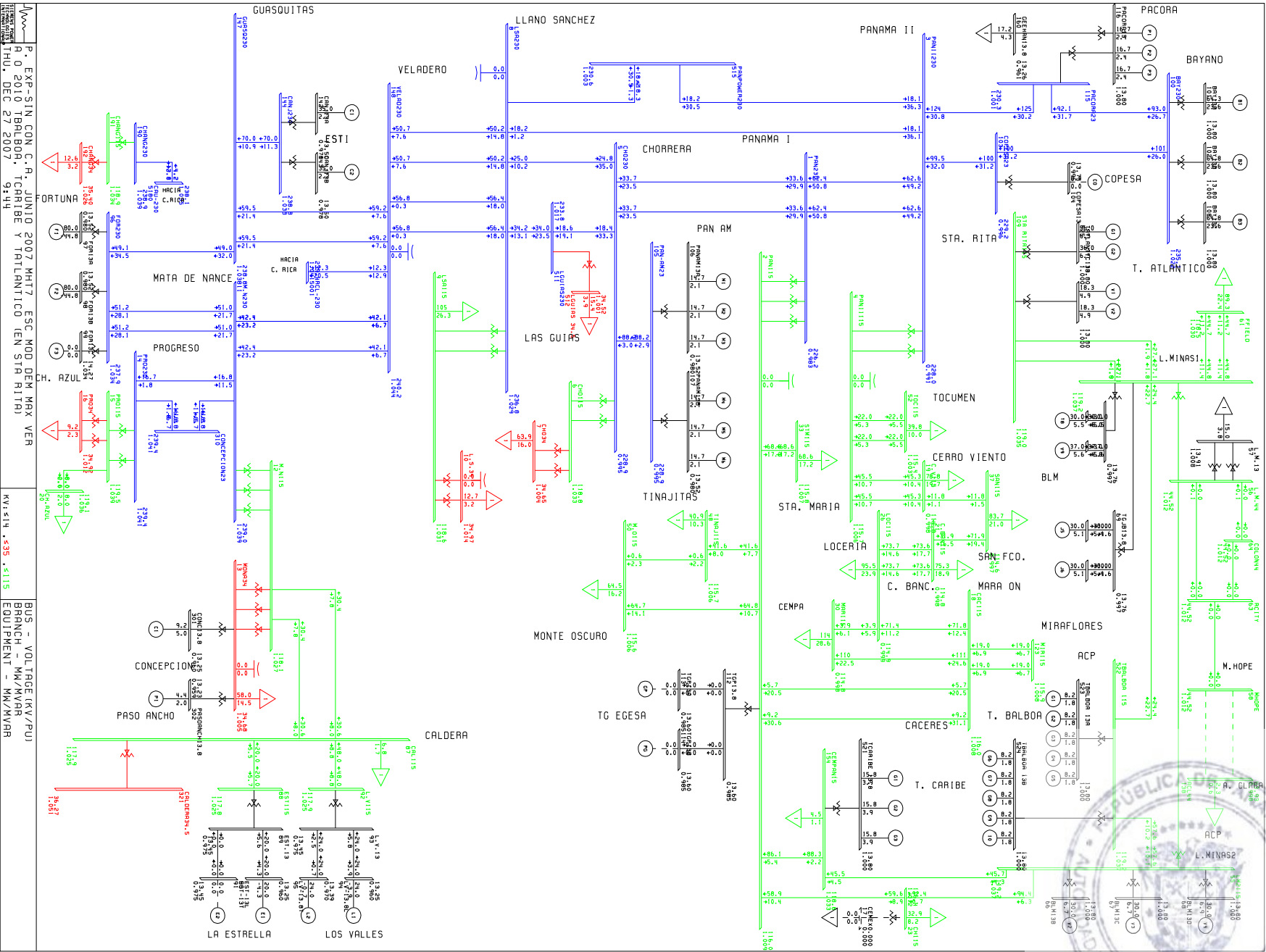
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AREA 7 [ACANAL ] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
126	MIR13A	12.000	G1	8.6	0.0	5.0	0.0	1.0471	8.2	1.0000	13.5					2	7	
127	MIR13B	12.000	G2	8.6	0.0	5.0	0.0	1.0471	8.2	1.0000	13.5					2	7	
130	MIR13F	13.800	G5	10.7	4.6	8.0	0.0	1.0000	11.6	0.9193	27.7					2	7	
134	MAD6A	6.9000	G1	9.7	1.0	6.0	-6.0	1.0000	9.7	0.9945	13.0					2	7	
135	MAD6B	6.9000	G2	9.7	1.0	6.0	-6.0	1.0000	9.7	0.9946	13.0					2	7	
136	MAD6C	6.9000	G3	9.7	1.0	6.0	-6.0	1.0000	9.7	0.9946	13.0					2	7	
140	GAT6A	6.9000	G1	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9996	4.1					2	7	
140	GAT6A	6.9000	G2	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9996	4.1					2	7	
140	GAT6A	6.9000	G3	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9996	4.1					2	7	
141	GAT6B	6.9000	G4	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9850	5.6					2	7	
141	GAT6B	6.9000	G5	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9850	6.2					2	7	
141	GAT6B	6.9000	G6	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9850	6.2					2	7	
SUBSYSTEM TOTALS						74.3	5.7	51.0	-33.0			124.2						



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P. EXP-SIN CON C.A. JUNIO 2007 MH17 ESC MOD DEM MAX YER  
 R 0 2010 TBALBOR, TARRIBE Y TALLANTICO (EN STA RITA)  
 THU, DEC 27 2007 9:44

KV1514 - 335 - 5115

BUS - VOLTAGE (KV/PU)  
 BRANCH - MM/MVA  
 EQUIPMENT - MM/MVA



**PLAN DE EXPANSIÓN DEL SIN CON CENTROAMÉRICA 2008  
AÑO 2010 ESCENARIO MODERADO DE DEMANDA MÍNIMA EN VERANO  
Estudios Básicos**



*de*

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
1	PAN230	230.00	6	1.0142	233.26	3	PANII230	230.00	6	1.0158	233.64				
5	CHO230	230.00	6	1.0184	234.23	8	LSA230	230.00	6	1.0199	234.57				
11	M.N230	230.00	6	1.0245	235.64	14	PRO230	230.00	6	1.0289	236.64				
96	FOR230	230.00	6	1.0240	235.51	100	BAY230	230.00	6	1.0199	234.59				
103	COPESA23	230.00	6	1.0170	233.90	105	PAN-AM23	230.00	6	1.0184	234.23				
115	PACORA23	230.00	6	1.0181	234.17	144	CANJ230	230.00	6	1.0261	236.00				
147	GUASQ230	230.00	6	1.0261	236.01	148	VELAD230	230.00	6	1.0263	236.06				
190	CHANG230	230.00	6	1.0349	238.03	310	CONCEPCION23230.00	6	1.0273	236.28					
511	LGUIAS230	230.00	6	1.0221	235.08	515	PANPOWER230	230.00	6	1.0210	234.83				
6000	FRONTER	230.00	6	1.0296	236.82										

BUSES WITH VOLTAGE LESS THAN 1.0200:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
1	PAN230	230.00	6	1.0142	233.26	3	PANII230	230.00	6	1.0158	233.64				
5	CHO230	230.00	6	1.0184	234.23	8	LSA230	230.00	6	1.0199	234.57				
100	BAY230	230.00	6	1.0199	234.59	103	COPESA23	230.00	6	1.0170	233.90				
105	PAN-AM23	230.00	6	1.0184	234.23	115	PACORA23	230.00	6	1.0181	234.17				

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2	PAN115	115.00	6	1.0063	115.72	4	PANII115	115.00	6	1.0089	116.02				
6	CHO115	115.00	6	1.0673	122.74	9	LSA115	115.00	6	1.0220	117.53				
15	PRO115	115.00	6	1.0287	118.30	18	CAC115	115.00	6	1.0061	115.70				
19	C.V115	115.00	6	1.0051	115.59	20	CH.AZUL	115.00	6	1.0280	118.22				
21	C.BAN115	115.00	6	1.0030	115.35	23	CH115	115.00	6	1.0070	115.81				
26	LOC115	115.00	6	1.0033	115.38	30	MAR115	115.00	6	1.0024	115.28				
33	STM115	115.00	6	1.0056	115.64	37	SAN115	115.00	6	1.0028	115.32				
48	TINAJ115	115.00	6	1.0053	115.61	50	M.O115	115.00	6	1.0053	115.61				
52	TOC115	115.00	6	1.0079	115.90	54	LM115	115.00	6	1.0129	116.48				
55	LM2115	115.00	6	1.0136	116.57	61	FFIELD	115.00	9	1.0104	116.20				
87	CAL115	115.00	6	1.0011	115.12	88	EST115	115.00	6	1.0014	115.16				
92	L.V115	115.00	6	1.0012	115.14	109	STA RITA115	115.00	6	1.0121	116.40				
110	PTMD115A	115.00	6	1.0104	116.20	111	PTMD115B	115.00	6	1.0104	116.20				
123	MIR115	115.00	7	1.0054	115.62	154	CEMPAN15	115.00	6	1.0142	116.63				
191	CHANG115	115.00	6	1.0332	118.82	522	TBALBOA	115 115.00	6	1.0133	116.53				

BUSES WITH VOLTAGE LESS THAN 1.0200:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2	PAN115	115.00	6	1.0063	115.72	4	PANII115	115.00	6	1.0089	116.02				
12	M.N115	115.00	6	0.9996	114.96	18	CAC115	115.00	6	1.0061	115.70				
19	C.V115	115.00	6	1.0051	115.59	21	C.BAN115	115.00	6	1.0030	115.35				
23	CH115	115.00	6	1.0070	115.81	26	LOC115	115.00	6	1.0033	115.38				
30	MAR115	115.00	6	1.0024	115.28	33	STM115	115.00	6	1.0056	115.64				
37	SAN115	115.00	6	1.0028	115.32	48	TINAJ115	115.00	6	1.0053	115.61				
50	M.O115	115.00	6	1.0053	115.61	52	TOC115	115.00	6	1.0079	115.90				
54	LM115	115.00	6	1.0129	116.48	55	LM2115	115.00	6	1.0136	116.57				
61	FFIELD	115.00	9	1.0104	116.20	87	CAL115	115.00	6	1.0011	115.12				
88	EST115	115.00	6	1.0014	115.16	92	L.V115	115.00	6	1.0012	115.14				
109	STA RITA115	115.00	6	1.0121	116.40	110	PTMD115A	115.00	6	1.0104	116.20				
111	PTMD115B	115.00	6	1.0104	116.20	123	MIR115	115.00	7	1.0054	115.62				
154	CEMPAN15	115.00	6	1.0142	116.63	522	TBALBOA	115 115.00	6	1.0133	116.53				



PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
 PLAN DE EXPANSION DEL SIN CON C.A. JUNIO 2007  
 AÑO 2010 ESCENARIO MOD DEMANDA MINIMA DE VERANO.

THU, DEC 27 2007 9:07

AREA 6 [PANAMA ] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
66		BLM13B		13.800	V2	32.0	3.2	17.0	0.0	0.9700	33.2	0.9949	47.0			1	6	
67		BLM13C		13.800	V3	32.0	3.2	17.0	0.0	0.9700	33.2	0.9949	47.0			1	6	
68		BLM13D		13.800	V4	32.0	3.3	30.0	0.0	0.9700	33.2	0.9948	47.0			1	6	
90		EST-13L		13.800	E1	15.0	-0.7	12.0	-5.0	0.9500	15.8	0.9988	27.0			1	6	
94		LV-13.8L		13.800	L1	17.0	-0.6	12.0	-5.0	0.9500	17.9	0.9994	27.0			1	6	
97		FOR13A		13.800	F1	61.2	-28.5	50.0	-50.0	0.9900	68.3	0.9064	111.0			1	6	SYST
98		FOR13B		13.800	F2	55.0	-28.9	50.0	-50.0	0.9900	62.8	0.8852	111.0			1	6	
106		PANAM13A		13.800	M1	14.1	0.0	9.0	0.0	0.9887	14.3	1.0000	20.7			1	6	
106		PANAM13A		13.800	M2	14.1	0.0	9.0	0.0	0.9887	14.3	1.0000	20.7			1	6	
106		PANAM13A		13.800	M3	14.1	0.0	9.0	0.0	0.9887	14.3	1.0000	20.7			1	6	
116		PACORA13		13.800	P1	15.4	0.0	8.8	0.0	1.0118	15.2	1.0000	21.7			1	6	
116		PACORA13		13.800	P2	15.4	0.0	8.8	0.0	1.0118	15.2	1.0000	21.7			1	6	
116		PACORA13		13.800	P3	15.4	0.0	8.8	0.0	1.0118	15.2	1.0000	21.7			1	6	
142		CANJ13A		13.800	C1	50.0	8.4	29.0	-29.0	0.9783	51.8	0.9863	69.0			1	6	
521		TCARIBE	13.813	13.800	G1	10.0	1.4	8.8	0.0	0.9700	10.4	0.9901	21.7			1	6	
521		TCARIBE	13.813	13.800	G2	10.0	1.4	8.8	0.0	0.9700	10.4	0.9901	21.7			1	6	
523		TBALBOA	13A	13.800	G1	10.0	1.7	8.8	0.0	0.9700	10.5	0.9865	21.7			1	6	
523		TBALBOA	13A	13.800	G2	10.0	1.7	8.8	0.0	0.9700	10.5	0.9865	21.7			1	6	
SUBSYSTEM TOTALS						422.8	-34.5	305.8	-139.0				699.9					

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
 PLAN DE EXPANSION DEL SIN CON C.A. JUNIO 2007  
 AÑO 2010 ESCENARIO MOD DEMANDA MINIMA DE VERANO.

THU, DEC 27 2007 9:07

AREA 7 [ACANAL ] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING	
135		MAD6B		6.9000	G2	10.0	1.4	6.0	-6.0	1.0000	10.1	0.9897	13.0			2	7		
136		MAD6C		6.9000	G3	10.0	1.4	6.0	-6.0	1.0000	10.1	0.9897	13.0			2	7		
140		GAT6A		6.9000	G1	2.0	-0.1	2.0	-2.0	1.0000	2.0	0.9994	4.1			2	7		
140		GAT6A		6.9000	G2	2.0	-0.1	2.0	-2.0	1.0000	2.0	0.9994	4.1			2	7		
140		GAT6A		6.9000	G3	2.0	-0.1	2.0	-2.0	1.0000	2.0	0.9994	4.1			2	7		
141		GAT6B		6.9000	G4	4.0	-0.8	3.0	-3.0	1.0000	4.1	0.9805	5.6			2	7		
141		GAT6B		6.9000	G5	4.0	-0.8	3.0	-3.0	1.0000	4.1	0.9805	6.2			2	7		
141		GAT6B		6.9000	G6	4.0	-0.8	3.0	-3.0	1.0000	4.1	0.9805	6.2			2	7		
SUBSYSTEM TOTALS						38.0	0.3	27.0	-27.0				56.4						

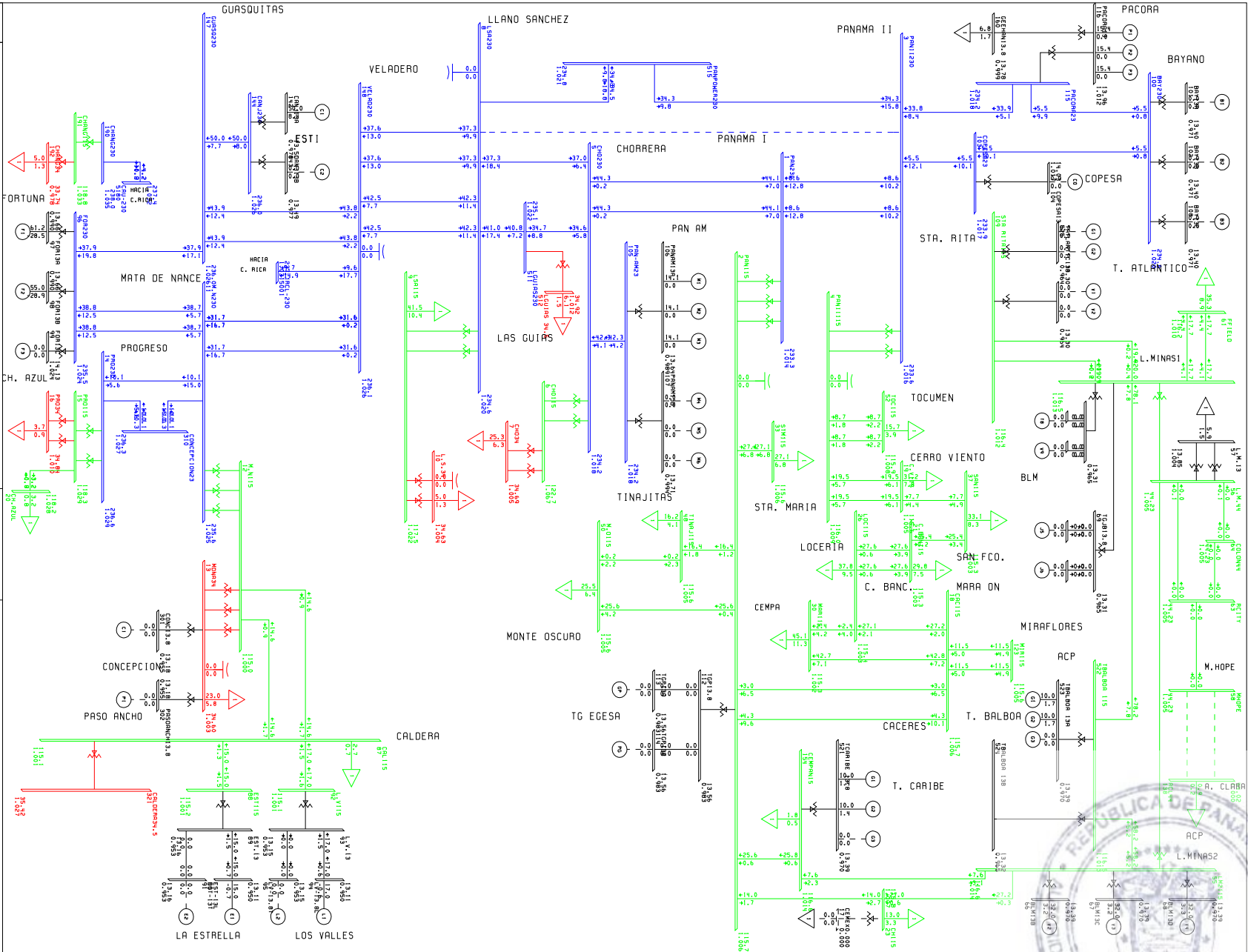


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PLAN DE EXPANSION DEL SIN CON C.R. JUNIO 2007  
 R O 2010 ESCENARIO MOD DEMANDA MINIMA DE VERANO. MH17  
 9:42

KV:519 .435 .5115

BUS - VOLTAGE (KV/FU)  
 BRANCH - MW/MVAR  
 EQUIPMENT - MW/MVAR



**PLAN DE EXPANSIÓN DEL SIN 2008**  
**AÑO 2010 ESCENARIO MODERADO DE DEMANDA MÁXIMA INVIERNO**  
**Contingencia Llano Sánchez-Panamá II**



*de*



BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
8		LSA230		230.00	6	1.0209	234.81	11		M.N230		230.00	6	1.0324	237.45
14		PRO230		230.00	6	1.0349	238.04	96		FOR230		230.00	6	1.0286	236.58
100		BAY230		230.00	6	1.0151	233.48	144		CANJ230		230.00	6	1.0318	237.32
147		GUASQ230		230.00	6	1.0319	237.34	148		VELAD230		230.00	6	1.0367	238.44
190		CHANG230		230.00	6	1.0354	238.14	310		CONCEPCION23		230.00	6	1.0343	237.88
511		LGUIAS230		230.00	6	1.0076	231.75	6000		FRONTER		230.00	6	1.0355	238.16

BUSES WITH VOLTAGE LESS THAN 1.0200:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
1		PAN230		230.00	6	0.9733	223.85	3		PANII230		230.00	6	0.9795	225.29
5		CHO230		230.00	6	0.9860	226.78	100		BAY230		230.00	6	1.0151	233.48
103		COPESA23		230.00	6	0.9852	226.60	105		PAN-AM23		230.00	6	0.9861	226.80
115		PACORA23		230.00	6	0.9911	227.95	511		LGUIAS230		230.00	6	1.0076	231.75
515		PANPOWER230		230.00	6	0.9911	227.96								

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2		PAN115		115.00	6	1.0017	115.19	4		PANII115		115.00	6	1.0042	115.48
6		CHO115		115.00	6	1.0230	117.65	9		LSA115		115.00	6	1.0223	117.56
12		M.N115		115.00	6	1.0163	116.87	15		PRO115		115.00	6	1.0329	118.79
18		CAC115		115.00	6	1.0013	115.15	20		CH.AZUL		115.00	6	1.0299	118.44
23		CH115		115.00	6	1.0072	115.83	52		TOC115		115.00	6	1.0014	115.16
54		LM115		115.00	6	1.0343	118.95	55		LM2115		115.00	6	1.0346	118.98
61		FFIELD		115.00	9	1.0280	118.22	87		CAL115		115.00	6	1.0173	116.98
88		EST115		115.00	6	1.0176	117.03	92		L.V115		115.00	6	1.0177	117.03
109		STA RITA115		115.00	6	1.0328	118.77	110		PTMD115A		115.00	6	1.0199	117.28
111		PTMD115B		115.00	6	1.0199	117.28	123		MIR115		115.00	7	1.0011	115.13
154		CEMPAN15		115.00	6	1.0307	118.54	191		CHANG115		115.00	6	1.0306	118.52
522		TBALBOA 115		115.00	6	1.0347	118.99								

BUSES WITH VOLTAGE LESS THAN 1.0200:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2		PAN115		115.00	6	1.0017	115.19	4		PANII115		115.00	6	1.0042	115.48
12		M.N115		115.00	6	1.0163	116.87	18		CAC115		115.00	6	1.0013	115.15
19		C.V115		115.00	6	0.9950	114.43	21		C.BAN115		115.00	6	0.9916	114.03
23		CH115		115.00	6	1.0072	115.83	26		LOC115		115.00	6	0.9926	114.15
30		MAR115		115.00	6	0.9910	113.97	33		STM115		115.00	6	0.9999	114.99
37		SAN115		115.00	6	0.9907	113.92	48		TINAJ115		115.00	6	0.9985	114.83
50		M.O115		115.00	6	0.9984	114.82	52		TOC115		115.00	6	1.0014	115.16
87		CAL115		115.00	6	1.0173	116.98	88		EST115		115.00	6	1.0176	117.03
92		L.V115		115.00	6	1.0177	117.03	110		PTMD115A		115.00	6	1.0199	117.28
111		PTMD115B		115.00	6	1.0199	117.28	123		MIR115		115.00	7	1.0011	115.13



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AREA 6 [PANAMA ] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
66		BLM13B		13.800	V2	37.0	8.1	17.0	0.0	1.0000	37.9	0.9767	47.0			1	6	
67		BLM13C		13.800	V3	37.0	8.1	17.0	0.0	1.0000	37.9	0.9767	47.0			1	6	
68		BLM13D		13.800	V4	37.0	8.4	30.0	0.0	1.0000	37.9	0.9752	47.0			1	6	
70		TGJB13A		13.800	J5	30.0	5.7	20.0	0.0	1.0000	30.5	0.9825	39.4			1	6	
71		TGJB13B		13.800	J6	30.0	5.7	20.0	0.0	1.0000	30.5	0.9825	39.4			1	6	
73		BLMCCB		13.800	V9	20.0	7.4	40.0	0.0	1.0000	21.3	0.9380	71.0			1	6	
90		EST-13L		13.800	E1	22.0	-1.8	12.0	-5.0	0.9600	23.0	0.9965	27.0			1	6	
91		EST-13T		13.800	E2	22.0	-1.8	12.0	-5.0	0.9600	23.0	0.9965	27.0			1	6	
94		LV-13.8L		13.800	L1	24.0	-1.8	12.0	-5.0	0.9600	25.1	0.9971	27.0			1	6	
95		LV-13.8T		13.800	L2	24.0	1.4	12.0	-5.0	0.9700	24.8	0.9983	27.0			1	6	
97		FOR13A		13.800	F1	80.0	-39.8	50.0	-50.0	0.9800	91.2	0.8952	111.0			1	6	
98		FOR13B		13.800	F2	80.0	-39.8	50.0	-50.0	0.9800	91.2	0.8952	111.0			1	6	
101		BAY13A		13.800	B1	66.4	28.9	50.0	-25.0	1.0000	72.4	0.9169	96.0			1	6	SYST
102		BAY13B		13.800	B2	68.7	29.1	50.0	-25.0	1.0000	74.6	0.9207	96.0			1	6	
106		PANAM13A		13.800	M1	13.5	3.2	9.0	0.0	0.9800	14.2	0.9727	20.7			1	6	
106		PANAM13A		13.800	M2	13.5	3.2	9.0	0.0	0.9800	14.2	0.9727	20.7			1	6	
106		PANAM13A		13.800	M3	13.5	3.2	9.0	0.0	0.9800	14.2	0.9727	20.7			1	6	
107		PANAM13B		13.800	M4	13.5	3.2	9.0	0.0	0.9800	14.2	0.9727	20.7			1	6	
107		PANAM13B		13.800	M5	13.5	3.2	9.0	0.0	0.9800	14.2	0.9727	20.7			1	6	
107		PANAM13B		13.800	M6	13.5	3.2	9.0	0.0	0.9800	14.2	0.9727	20.7			1	6	
108		BAY13C		13.800	B3	68.7	29.1	50.0	-25.0	1.0000	74.6	0.9207	100.0			1	6	
116		PACORA13		13.800	P1	14.0	4.0	8.8	0.0	1.0000	14.6	0.9610	21.7			1	6	
116		PACORA13		13.800	P2	14.0	4.0	8.8	0.0	1.0000	14.6	0.9610	21.7			1	6	
116		PACORA13		13.800	P3	14.0	4.0	8.8	0.0	1.0000	14.6	0.9610	21.7			1	6	
142		CANJ13A		13.800	C1	46.0	6.2	29.0	-29.0	0.9783	47.4	0.9911	69.0			1	6	
143		CANJ13B		13.800	C2	46.0	6.2	29.0	-29.0	0.9783	47.4	0.9911	69.0			1	6	
521		TCARIBE	13.813	13.800	G1	15.8	4.4	12.5	0.0	1.0000	16.4	0.9631	20.9			1	6	
521		TCARIBE	13.813	13.800	G2	15.8	4.4	12.5	0.0	1.0000	16.4	0.9631	20.9			1	6	
521		TCARIBE	13.813	13.800	G3	15.8	4.4	12.5	0.0	1.0000	16.4	0.9631	20.9			1	6	
523		TBALBOA	13A	13.800	G1	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9692	10.9			1	6	
523		TBALBOA	13A	13.800	G2	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9692	10.9			1	6	
523		TBALBOA	13A	13.800	G3	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9692	10.9			1	6	
523		TBALBOA	13A	13.800	G4	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9692	10.9			1	6	
523		TBALBOA	13A	13.800	G5	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9692	10.9			1	6	
524		TBALBOA	13B	13.800	10	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9692	10.9			1	6	
524		TBALBOA	13B	13.800	G6	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9692	10.9			1	6	
524		TBALBOA	13B	13.800	G7	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9692	10.9			1	6	
524		TBALBOA	13B	13.800	G8	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9692	10.9			1	6	
524		TBALBOA	13B	13.800	G9	8.2	2.1	6.6	-6.6	1.0000	8.5	0.9692	10.9			1	6	
525		TATLANTIC13A	13.800	G1	36.0	7.2	28.5	0.0	1.0000	36.7	0.9804	47.5			1	6		
525		TATLANTIC13A	13.800	G2	36.0	7.2	28.5	0.0	1.0000	36.7	0.9804	47.5			1	6		
526		TATLANTIC13B	13.800	V1	18.3	5.7	15.0	0.0	1.0000	19.2	0.9554	25.0			1	6		
526		TATLANTIC13B	13.800	V2	18.3	5.7	15.0	0.0	1.0000	19.2	0.9554	25.0			1	6		
SUBSYSTEM TOTALS						1099.8	150.4	770.6	-318.6				1557.0					

AREA 7 [ACANAL ] MACHINE SUMMARY:



*Handwritten signature or initials.*

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
126	MIR13A	12.000	G1	8.6	0.0	5.0	0.0	1.0435	8.3	1.0000	13.5					2	7	
127	MIR13B	12.000	G2	8.6	0.0	5.0	0.0	1.0436	8.3	1.0000	13.5					2	7	
130	MIR13F	13.800	G5	10.7	6.1	8.0	0.0	1.0000	12.3	0.8681	27.7					2	7	
134	MAD6A	6.9000	G1	9.7	1.2	6.0	-6.0	1.0000	9.7	0.9923	13.0					2	7	
135	MAD6B	6.9000	G2	9.7	1.2	6.0	-6.0	1.0000	9.7	0.9924	13.0					2	7	
136	MAD6C	6.9000	G3	9.7	1.2	6.0	-6.0	1.0000	9.7	0.9924	13.0					2	7	
140	GAT6A	6.9000	G1	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9984	4.1					2	7	
140	GAT6A	6.9000	G2	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9984	4.1					2	7	
140	GAT6A	6.9000	G3	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9984	4.1					2	7	
141	GAT6B	6.9000	G4	3.9	-0.6	3.0	-3.0	1.0000	3.9	0.9872	5.6					2	7	
141	GAT6B	6.9000	G5	3.9	-0.6	3.0	-3.0	1.0000	3.9	0.9872	6.2					2	7	
141	GAT6B	6.9000	G6	3.9	-0.6	3.0	-3.0	1.0000	3.9	0.9872	6.2					2	7	
SUBSYSTEM TOTALS						74.3	8.2	51.0	-33.0			124.2						



*Handwritten signature or initials.*



**PLAN DE EXPANSIÓN DEL SIN 2008**  
**AÑO 2010 ESCENARIO MODERADO DE DEMANDA MÁXIMA INVIERNO**  
**Contingencia Guasquitas-Veladero**



*de*

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
8		LSA230		230.00	6	1.0216	234.98	11		M.N230		230.00	6	1.0297	236.84
14		PRO230		230.00	6	1.0326	237.49	96		FOR230		230.00	6	1.0257	235.92
100		BAY230		230.00	6	1.0202	234.66	144		CANJ230		230.00	6	1.0274	236.30
147		GUASQ230		230.00	6	1.0275	236.32	148		VELAD230		230.00	6	1.0346	237.96
190		CHANG230		230.00	6	1.0335	237.71	310		CONCEPCION23		230.00	6	1.0318	237.30
511		LGUIAS230		230.00	6	1.0104	232.38	6000		FRONTER		230.00	6	1.0332	237.64

BUSES WITH VOLTAGE LESS THAN 1.0200:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
1		PAN230		230.00	6	0.9803	225.46	3		PANII230		230.00	6	0.9883	227.31
5		CHO230		230.00	6	0.9913	227.99	103		COPESA23		230.00	6	0.9934	228.49
105		PAN-AM23		230.00	6	0.9913	228.00	115		PACORA23		230.00	6	0.9984	229.63
511		LGUIAS230		230.00	6	1.0104	232.38	515		PANPOWER230		230.00	6	0.9987	229.69

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2		PAN115		115.00	6	1.0068	115.78	4		PANII115		115.00	6	1.0032	115.37
6		CHO115		115.00	6	1.0287	118.30	9		LSA115		115.00	6	1.0230	117.65
12		M.N115		115.00	6	1.0143	116.64	15		PRO115		115.00	6	1.0305	118.51
18		CAC115		115.00	6	1.0063	115.73	20		CH.AZUL		115.00	6	1.0275	118.16
23		CH115		115.00	6	1.0109	116.25	33		STM115		115.00	6	1.0051	115.58
48		TINAJ115		115.00	6	1.0036	115.42	50		M.O115		115.00	6	1.0036	115.41
52		TOC115		115.00	6	1.0004	115.05	54		LM1115		115.00	6	1.0359	119.12
55		LM2115		115.00	6	1.0362	119.16	61		FFIELD		115.00	9	1.0296	118.40
87		CAL115		115.00	6	1.0159	116.83	88		EST115		115.00	6	1.0164	116.89
92		L.V115		115.00	6	1.0164	116.88	109		STA RITA115		115.00	6	1.0345	118.97
110		PTMD115A		115.00	6	1.0231	117.65	111		PTMD115B		115.00	6	1.0231	117.65
123		MIR115		115.00	7	1.0058	115.67	154		CEMPAN15		115.00	6	1.0329	118.78
191		CHANG115		115.00	6	1.0287	118.30	522		TBALBOA		115	6	1.0362	119.17

BUSES WITH VOLTAGE LESS THAN 1.0200:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2		PAN115		115.00	6	1.0068	115.78	4		PANII115		115.00	6	1.0032	115.37
12		M.N115		115.00	6	1.0143	116.64	18		CAC115		115.00	6	1.0063	115.73
19		C.V115		115.00	6	0.9957	114.51	21		C.BAN115		115.00	6	0.9959	114.53
23		CH115		115.00	6	1.0109	116.25	26		LOC115		115.00	6	0.9971	114.67
30		MAR115		115.00	6	0.9958	114.52	33		STM115		115.00	6	1.0051	115.58
37		SAN115		115.00	6	0.9947	114.39	48		TINAJ115		115.00	6	1.0036	115.42
50		M.O115		115.00	6	1.0036	115.41	52		TOC115		115.00	6	1.0004	115.05
87		CAL115		115.00	6	1.0159	116.83	88		EST115		115.00	6	1.0164	116.89
92		L.V115		115.00	6	1.0164	116.88	123		MIR115		115.00	7	1.0058	115.67



*Handwritten signature or initials.*

AREA 6 [PANAMA ] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X	T	R	A	N	GENTAP	ZONE	AREA	SWING	
66		BLM13B		13.800	V2	37.0	7.5	17.0	0.0	1.0000	37.7	0.9802	47.0							1	6		
67		BLM13C		13.800	V3	37.0	7.5	17.0	0.0	1.0000	37.7	0.9802	47.0							1	6		
68		BLM13D		13.800	V4	37.0	7.7	30.0	0.0	1.0000	37.8	0.9790	47.0							1	6		
70		TGJB13A		13.800	J5	30.0	5.3	20.0	0.0	1.0000	30.5	0.9847	39.4							1	6		
71		TGJB13B		13.800	J6	30.0	5.3	20.0	0.0	1.0000	30.5	0.9847	39.4							1	6		
73		BLMCCB		13.800	V9	20.0	6.7	40.0	0.0	1.0000	21.1	0.9481	71.0							1	6		
90		EST-13L		13.800	E1	22.0	-1.5	12.0	-5.0	0.9600	23.0	0.9977	27.0							1	6		
91		EST-13T		13.800	E2	22.0	-1.5	12.0	-5.0	0.9600	23.0	0.9977	27.0							1	6		
94		LV-13.8L		13.800	L1	24.0	-1.5	12.0	-5.0	0.9600	25.0	0.9981	27.0							1	6		
95		LV-13.8T		13.800	L2	24.0	1.8	12.0	-5.0	0.9700	24.8	0.9973	27.0							1	6		
97		FOR13A		13.800	F1	80.0	-37.2	50.0	-50.0	0.9800	90.0	0.9066	111.0							1	6		
98		FOR13B		13.800	F2	80.0	-37.2	50.0	-50.0	0.9800	90.0	0.9066	111.0							1	6		
101		BAY13A		13.800	B1	68.1	25.2	50.0	-25.0	1.0000	72.6	0.9377	96.0							1	6	SYST	
102		BAY13B		13.800	B2	68.1	25.2	50.0	-25.0	1.0000	72.6	0.9377	96.0							1	6		
106		PANAM13A		13.800	M1	13.5	2.5	9.0	0.0	0.9800	14.0	0.9834	20.7							1	6		
106		PANAM13A		13.800	M2	13.5	2.5	9.0	0.0	0.9800	14.0	0.9834	20.7							1	6		
106		PANAM13A		13.800	M3	13.5	2.5	9.0	0.0	0.9800	14.0	0.9834	20.7							1	6		
107		PANAM13B		13.800	M4	13.5	2.5	9.0	0.0	0.9800	14.0	0.9834	20.7							1	6		
107		PANAM13B		13.800	M5	13.5	2.5	9.0	0.0	0.9800	14.0	0.9834	20.7							1	6		
107		PANAM13B		13.800	M6	13.5	2.5	9.0	0.0	0.9800	14.0	0.9834	20.7							1	6		
108		BAY13C		13.800	B3	68.1	25.2	50.0	-25.0	1.0000	72.6	0.9377	100.0							1	6		
116		PACORA13		13.800	P1	14.0	2.7	8.8	0.0	1.0000	14.3	0.9817	21.7							1	6		
116		PACORA13		13.800	P2	14.0	2.7	8.8	0.0	1.0000	14.3	0.9817	21.7							1	6		
116		PACORA13		13.800	P3	14.0	2.7	8.8	0.0	1.0000	14.3	0.9817	21.7							1	6		
142		CANJ13A		13.800	C1	46.0	6.9	29.0	-29.0	0.9783	47.5	0.9890	69.0							1	6		
143		CANJ13B		13.800	C2	46.0	6.9	29.0	-29.0	0.9783	47.5	0.9890	69.0							1	6		
521		TCARIBE	13.813.800	G1	15.8	4.0	12.5	0.0	1.0000	16.3	0.9695	20.9								1	6		
521		TCARIBE	13.813.800	G2	15.8	4.0	12.5	0.0	1.0000	16.3	0.9695	20.9								1	6		
521		TCARIBE	13.813.800	G3	15.8	4.0	12.5	0.0	1.0000	16.3	0.9695	20.9								1	6		
523		TBALBOA	13A	13.800	G1	8.2	1.9	6.6	-6.6	1.0000	8.4	0.9741	10.9							1	6		
523		TBALBOA	13A	13.800	G2	8.2	1.9	6.6	-6.6	1.0000	8.4	0.9741	10.9							1	6		
523		TBALBOA	13A	13.800	G3	8.2	1.9	6.6	-6.6	1.0000	8.4	0.9741	10.9							1	6		
523		TBALBOA	13A	13.800	G4	8.2	1.9	6.6	-6.6	1.0000	8.4	0.9741	10.9							1	6		
523		TBALBOA	13A	13.800	G5	8.2	1.9	6.6	-6.6	1.0000	8.4	0.9741	10.9							1	6		
524		TBALBOA	13B	13.800	10	8.2	1.9	6.6	-6.6	1.0000	8.4	0.9741	10.9							1	6		
524		TBALBOA	13B	13.800	G6	8.2	1.9	6.6	-6.6	1.0000	8.4	0.9741	10.9							1	6		
524		TBALBOA	13B	13.800	G7	8.2	1.9	6.6	-6.6	1.0000	8.4	0.9741	10.9							1	6		
524		TBALBOA	13B	13.800	G8	8.2	1.9	6.6	-6.6	1.0000	8.4	0.9741	10.9							1	6		
524		TBALBOA	13B	13.800	G9	8.2	1.9	6.6	-6.6	1.0000	8.4	0.9741	10.9							1	6		
525		TATLANTIC13A	13.800	G1	36.0	6.7	28.5	0.0	1.0000	36.6	0.9831	47.5								1	6		
525		TATLANTIC13A	13.800	G2	36.0	6.7	28.5	0.0	1.0000	36.6	0.9831	47.5								1	6		
526		TATLANTIC13B	13.800	V1	18.3	5.1	15.0	0.0	1.0000	19.0	0.9628	25.0								1	6		
526		TATLANTIC13B	13.800	V2	18.3	5.1	15.0	0.0	1.0000	19.0	0.9628	25.0								1	6		
SUBSYSTEM TOTALS						1100.2	130.0	770.6	-318.6				1557.0										

AREA 7 [ACANAL ] MACHINE SUMMARY:



*Handwritten signature or initials.*

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
126	MIR13A	12.000	G1	8.6	0.0	5.0	0.0	1.0461	8.2	1.0000	13.5					2	7	
127	MIR13B	12.000	G2	8.6	0.0	5.0	0.0	1.0461	8.2	1.0000	13.5					2	7	
130	MIR13F	13.800	G5	10.7	5.0	8.0	0.0	1.0000	11.8	0.9052	27.7					2	7	
134	MAD6A	6.9000	G1	9.7	1.1	6.0	-6.0	1.0000	9.7	0.9939	13.0					2	7	
135	MAD6B	6.9000	G2	9.7	1.1	6.0	-6.0	1.0000	9.7	0.9940	13.0					2	7	
136	MAD6C	6.9000	G3	9.7	1.1	6.0	-6.0	1.0000	9.7	0.9940	13.0					2	7	
140	GAT6A	6.9000	G1	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9993	4.1					2	7	
140	GAT6A	6.9000	G2	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9993	4.1					2	7	
140	GAT6A	6.9000	G3	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9993	4.1					2	7	
141	GAT6B	6.9000	G4	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9857	6.2					2	7	
141	GAT6B	6.9000	G5	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9857	6.2					2	7	
141	GAT6B	6.9000	G6	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9857	6.2					2	7	
SUBSYSTEM TOTALS						74.3	6.4	51.0	-33.0			124.2						



*Handwritten signature or initials.*





**PLAN DE EXPANSIÓN DEL SIN 2008**  
**AÑO 2010 ESCENARIO MODERADO DE DEMANDA MÁXIMA INVIERNO**  
**Contingencia Mata de Nance-Veladero**



*de*

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
8	LSA230	230.00	6	1.0223	235.13	11	M.N230	230.00	6	1.0286	236.57				
14	PRO230	230.00	6	1.0317	237.29	96	FOR230	230.00	6	1.0259	235.96				
100	BAY230	230.00	6	1.0204	234.69	144	CANJ230	230.00	6	1.0295	236.78				
147	GUASQ230	230.00	6	1.0295	236.79	148	VELAD230	230.00	6	1.0355	238.17				
190	CHANG230	230.00	6	1.0337	237.74	310	CONCEPCION23	230.00	6	1.0307	237.07				
511	LGUIAS230	230.00	6	1.0109	232.50	6000	FRONTER	230.00	6	1.0325	237.46				

BUSES WITH VOLTAGE LESS THAN 1.0200:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
1	PAN230	230.00	6	0.9805	225.52	3	PANII230	230.00	6	0.9886	227.37				
5	CHO230	230.00	6	0.9915	228.05	103	COPESA23	230.00	6	0.9937	228.54				
105	PAN-AM23	230.00	6	0.9916	228.07	115	PACORA23	230.00	6	0.9986	229.67				
511	LGUIAS230	230.00	6	1.0109	232.50	515	PANPOWER230	230.00	6	0.9990	229.77				

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2	PAN115	115.00	6	1.0070	115.81	4	PANII115	115.00	6	1.0034	115.39				
6	CHO115	115.00	6	1.0289	118.32	9	LSA115	115.00	6	1.0238	117.73				
12	M.N115	115.00	6	1.0134	116.54	15	PRO115	115.00	6	1.0296	118.41				
18	CAC115	115.00	6	1.0066	115.75	20	CH.AZUL	115.00	6	1.0266	118.06				
23	CH115	115.00	6	1.0110	116.27	33	STM115	115.00	6	1.0053	115.61				
48	TINAJ115	115.00	6	1.0039	115.44	50	M.O115	115.00	6	1.0038	115.44				
52	TOC115	115.00	6	1.0007	115.08	54	LM115	115.00	6	1.0359	119.13				
55	LM2115	115.00	6	1.0362	119.17	61	FFIELD	115.00	9	1.0296	118.41				
87	CAL115	115.00	6	1.0153	116.76	88	EST115	115.00	6	1.0159	116.83				
92	L.V115	115.00	6	1.0158	116.82	109	STA RITA115	115.00	6	1.0346	118.98				
110	PTMD115A	115.00	6	1.0232	117.67	111	PTMD115B	115.00	6	1.0232	117.67				
123	MIR115	115.00	7	1.0060	115.70	154	CEMPAN15	115.00	6	1.0329	118.79				
191	CHANG115	115.00	6	1.0289	118.32	522	TBALBOA	115	6	1.0363	119.18				

BUSES WITH VOLTAGE LESS THAN 1.0200:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2	PAN115	115.00	6	1.0070	115.81	4	PANII115	115.00	6	1.0034	115.39				
12	M.N115	115.00	6	1.0134	116.54	18	CAC115	115.00	6	1.0066	115.75				
19	C.V115	115.00	6	0.9960	114.54	21	C.BAN115	115.00	6	0.9962	114.56				
23	CH115	115.00	6	1.0110	116.27	26	LOC115	115.00	6	0.9974	114.70				
30	MAR115	115.00	6	0.9961	114.55	33	STM115	115.00	6	1.0053	115.61				
37	SAN115	115.00	6	0.9949	114.41	48	TINAJ115	115.00	6	1.0039	115.44				
50	M.O115	115.00	6	1.0038	115.44	52	TOC115	115.00	6	1.0007	115.08				
87	CAL115	115.00	6	1.0153	116.76	88	EST115	115.00	6	1.0159	116.83				
92	L.V115	115.00	6	1.0158	116.82	123	MIR115	115.00	7	1.0060	115.70				



AREA 6 [PANAMA ] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
66		BLM13B		13.800	V2	37.0	7.4	17.0	0.0	1.0000	37.7	0.9804	47.0			1	6	
67		BLM13C		13.800	V3	37.0	7.4	17.0	0.0	1.0000	37.7	0.9804	47.0			1	6	
68		BLM13D		13.800	V4	37.0	7.7	30.0	0.0	1.0000	37.8	0.9792	47.0			1	6	
70		TGJB13A		13.800	J5	30.0	5.3	20.0	0.0	1.0000	30.5	0.9848	39.4			1	6	
71		TGJB13B		13.800	J6	30.0	5.3	20.0	0.0	1.0000	30.5	0.9848	39.4			1	6	
73		BLMCCB		13.800	V9	20.0	6.7	40.0	0.0	1.0000	21.1	0.9485	71.0			1	6	
90		EST-13L		13.800	E1	22.0	-1.3	12.0	-5.0	0.9600	23.0	0.9981	27.0			1	6	
91		EST-13T		13.800	E2	22.0	-1.3	12.0	-5.0	0.9600	23.0	0.9981	27.0			1	6	
94		LV-13.8L		13.800	L1	24.0	-1.3	12.0	-5.0	0.9600	25.0	0.9985	27.0			1	6	
95		LV-13.8T		13.800	L2	24.0	1.9	12.0	-5.0	0.9700	24.8	0.9967	27.0			1	6	
97		FOR13A		13.800	F1	80.0	-37.4	50.0	-50.0	0.9800	90.1	0.9060	111.0			1	6	
98		FOR13B		13.800	F2	80.0	-37.4	50.0	-50.0	0.9800	90.1	0.9060	111.0			1	6	
101		BAY13A		13.800	B1	66.1	24.9	50.0	-25.0	1.0000	70.6	0.9356	96.0			1	6	SYST
102		BAY13B		13.800	B2	68.7	25.2	50.0	-25.0	1.0000	73.2	0.9389	96.0			1	6	
106		PANAM13A		13.800	M1	13.5	2.5	9.0	0.0	0.9800	14.0	0.9839	20.7			1	6	
106		PANAM13A		13.800	M2	13.5	2.5	9.0	0.0	0.9800	14.0	0.9839	20.7			1	6	
106		PANAM13A		13.800	M3	13.5	2.5	9.0	0.0	0.9800	14.0	0.9839	20.7			1	6	
107		PANAM13B		13.800	M4	13.5	2.5	9.0	0.0	0.9800	14.0	0.9839	20.7			1	6	
107		PANAM13B		13.800	M5	13.5	2.5	9.0	0.0	0.9800	14.0	0.9839	20.7			1	6	
107		PANAM13B		13.800	M6	13.5	2.5	9.0	0.0	0.9800	14.0	0.9839	20.7			1	6	
108		BAY13C		13.800	B3	68.7	25.2	50.0	-25.0	1.0000	73.2	0.9389	100.0			1	6	
116		PACORA13		13.800	P1	14.0	2.7	8.8	0.0	1.0000	14.3	0.9822	21.7			1	6	
116		PACORA13		13.800	P2	14.0	2.7	8.8	0.0	1.0000	14.3	0.9822	21.7			1	6	
116		PACORA13		13.800	P3	14.0	2.7	8.8	0.0	1.0000	14.3	0.9822	21.7			1	6	
142		CANJ13A		13.800	C1	46.0	6.5	29.0	-29.0	0.9783	47.5	0.9900	69.0			1	6	
143		CANJ13B		13.800	C2	46.0	6.5	29.0	-29.0	0.9783	47.5	0.9900	69.0			1	6	
521		TCARIBE	13.813	13.800	G1	15.8	4.0	12.5	0.0	1.0000	16.3	0.9697	20.9			1	6	
521		TCARIBE	13.813	13.800	G2	15.8	4.0	12.5	0.0	1.0000	16.3	0.9697	20.9			1	6	
521		TCARIBE	13.813	13.800	G3	15.8	4.0	12.5	0.0	1.0000	16.3	0.9697	20.9			1	6	
523		TBALBOA	13A	13.800	G1	8.2	1.9	6.6	-6.6	1.0000	8.4	0.9743	10.9			1	6	
523		TBALBOA	13A	13.800	G2	8.2	1.9	6.6	-6.6	1.0000	8.4	0.9743	10.9			1	6	
523		TBALBOA	13A	13.800	G3	8.2	1.9	6.6	-6.6	1.0000	8.4	0.9743	10.9			1	6	
523		TBALBOA	13A	13.800	G4	8.2	1.9	6.6	-6.6	1.0000	8.4	0.9743	10.9			1	6	
523		TBALBOA	13A	13.800	G5	8.2	1.9	6.6	-6.6	1.0000	8.4	0.9743	10.9			1	6	
524		TBALBOA	13B	13.800	10	8.2	1.9	6.6	-6.6	1.0000	8.4	0.9743	10.9			1	6	
524		TBALBOA	13B	13.800	G6	8.2	1.9	6.6	-6.6	1.0000	8.4	0.9743	10.9			1	6	
524		TBALBOA	13B	13.800	G7	8.2	1.9	6.6	-6.6	1.0000	8.4	0.9743	10.9			1	6	
524		TBALBOA	13B	13.800	G8	8.2	1.9	6.6	-6.6	1.0000	8.4	0.9743	10.9			1	6	
524		TBALBOA	13B	13.800	G9	8.2	1.9	6.6	-6.6	1.0000	8.4	0.9743	10.9			1	6	
525		TATLANTIC13A	13.800	G1	36.0	6.7	28.5	0.0	1.0000	36.6	0.9832	47.5			1	6		
525		TATLANTIC13A	13.800	G2	36.0	6.7	28.5	0.0	1.0000	36.6	0.9832	47.5			1	6		
526		TATLANTIC13B	13.800	V1	18.3	5.1	15.0	0.0	1.0000	19.0	0.9631	25.0			1	6		
526		TATLANTIC13B	13.800	V2	18.3	5.1	15.0	0.0	1.0000	19.0	0.9631	25.0			1	6		
SUBSYSTEM TOTALS						1099.5	128.6	770.6	-318.6				1557.0					

AREA 7 [ACANAL ] MACHINE SUMMARY:



*Handwritten signature or initials.*

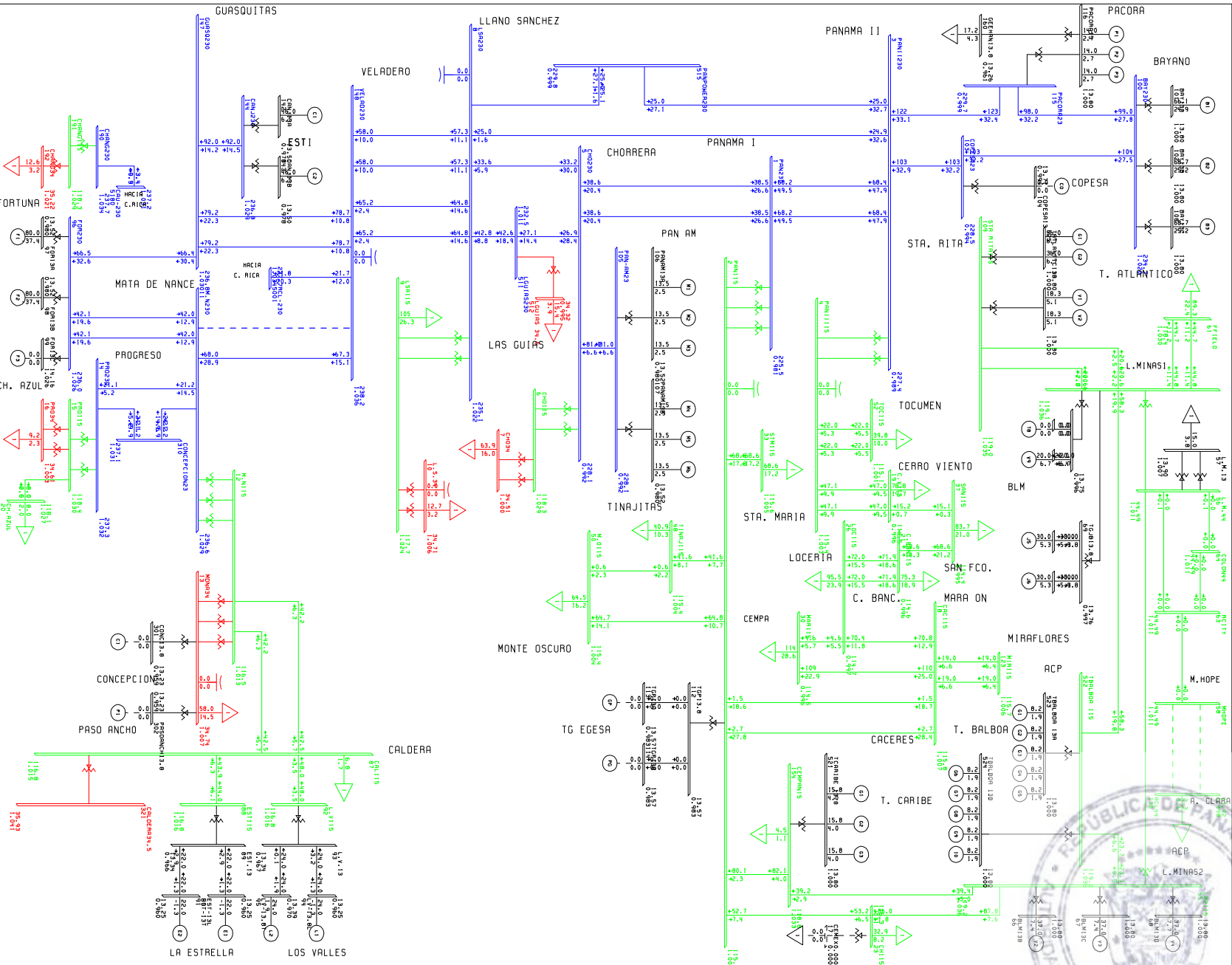
BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
126		MIR13A		12.000	G1	8.6	0.0	5.0	0.0	1.0462	8.2	1.0000	13.5			2	7	
127		MIR13B		12.000	G2	8.6	0.0	5.0	0.0	1.0462	8.2	1.0000	13.5			2	7	
130		MIR13F		13.800	G5	10.7	5.0	8.0	0.0	1.0000	11.8	0.9067	27.7			2	7	
134		MAD6A		6.9000	G1	9.7	1.1	6.0	-6.0	1.0000	9.7	0.9940	13.0			2	7	
135		MAD6B		6.9000	G2	9.7	1.1	6.0	-6.0	1.0000	9.7	0.9941	13.0			2	7	
136		MAD6C		6.9000	G3	9.7	1.1	6.0	-6.0	1.0000	9.7	0.9941	13.0			2	7	
140		GAT6A		6.9000	G1	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9993	4.1			2	7	
140		GAT6A		6.9000	G2	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9993	4.1			2	7	
140		GAT6A		6.9000	G3	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9993	4.1			2	7	
141		GAT6B		6.9000	G4	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9856	5.6			2	7	
141		GAT6B		6.9000	G5	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9856	6.2			2	7	
141		GAT6B		6.9000	G6	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9856	6.2			2	7	
SUBSYSTEM TOTALS						74.3	6.4	51.0	-33.0				124.2					



*Handwritten signature or initials.*

P. EXP. SIN CON. C. R. JUNIO 2007 MH7. ECG MOD DEM MAX INV  
 P. O. 2010. ESTUDIOS P. SUCOS-CONTINENCIA MDN-VEL  
 T. U. DEC 27 2007 9:35

BUS - VOLTAJE (KV/V/FU)  
 BRANCH - MM/MV/R  
 EQUIPMENT - MM/MV/R



Handwritten signature or initials.

**PLAN DE EXPANSIÓN DEL SIN 2008**  
**AÑO 2010 ESCENARIO MODERADO DE DEMANDA MÁXIMA INVIERNO**  
**Contingencia Panamá-Cemento Panamá**



*de*

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
8		LSA230		230.00	6	1.0219	235.03	11		M.N230		230.00	6	1.0328	237.54
14		PRO230		230.00	6	1.0353	238.13	96		FOR230		230.00	6	1.0290	236.67
100		BAY230		230.00	6	1.0178	234.10	144		CANJ230		230.00	6	1.0322	237.42
147		GUASQ230		230.00	6	1.0323	237.43	148		VELAD230		230.00	6	1.0373	238.59
190		CHANG230		230.00	6	1.0356	238.19	310		CONCEPCION23		230.00	6	1.0347	237.98
511		LGUIAS230		230.00	6	1.0093	232.15	6000		FRONTER		230.00	6	1.0359	238.25

BUSES WITH VOLTAGE LESS THAN 1.0200:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
1		PAN230		230.00	6	0.9763	224.55	3		PANII230		230.00	6	0.9842	226.36
5		CHO230		230.00	6	0.9885	227.35	100		BAY230		230.00	6	1.0178	234.10
103		COPESA23		230.00	6	0.9895	227.60	105		PAN-AM23		230.00	6	0.9886	227.37
115		PACORA23		230.00	6	0.9949	228.84	511		LGUIAS230		230.00	6	1.0093	232.15
515		PANPOWER230		230.00	6	0.9953	228.91								

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2		PAN115		115.00	6	1.0021	115.24	4		PANII115		115.00	6	1.0079	115.90
6		CHO115		115.00	6	1.0257	117.96	9		LSA115		115.00	6	1.0233	117.68
12		M.N115		115.00	6	1.0166	116.91	15		PRO115		115.00	6	1.0333	118.83
18		CAC115		115.00	6	1.0017	115.19	20		CH.AZUL		115.00	6	1.0303	118.48
23		CH115		115.00	6	1.0060	115.69	33		STM115		115.00	6	1.0003	115.04
52		TOC115		115.00	6	1.0051	115.59	54		LM1115		115.00	6	1.0349	119.01
55		LM2115		115.00	6	1.0357	119.10	61		FFIELD		115.00	9	1.0286	118.29
87		CAL115		115.00	6	1.0175	117.01	88		EST115		115.00	6	1.0178	117.05
92		L.V115		115.00	6	1.0179	117.05	109		STA RITA115		115.00	6	1.0324	118.72
110		PTMD115A		115.00	6	1.0191	117.20	111		PTMD115B		115.00	6	1.0191	117.20
123		MIR115		115.00	7	1.0015	115.17	154		CEMPAN15		115.00	6	1.0419	119.81
191		CHANG115		115.00	6	1.0308	118.55	522		TBALBOA 115		115.00	6	1.0355	119.08

BUSES WITH VOLTAGE LESS THAN 1.0200:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2		PAN115		115.00	6	1.0021	115.24	4		PANII115		115.00	6	1.0079	115.90
12		M.N115		115.00	6	1.0166	116.91	18		CAC115		115.00	6	1.0017	115.19
19		C.V115		115.00	6	0.9978	114.75	21		C.BAN115		115.00	6	0.9924	114.13
23		CH115		115.00	6	1.0060	115.69	26		LOC115		115.00	6	0.9933	114.23
30		MAR115		115.00	6	0.9916	114.03	33		STM115		115.00	6	1.0003	115.04
37		SAN115		115.00	6	0.9917	114.04	48		TINAJ115		115.00	6	0.9989	114.87
50		M.O115		115.00	6	0.9989	114.87	52		TOC115		115.00	6	1.0051	115.59
87		CAL115		115.00	6	1.0175	117.01	88		EST115		115.00	6	1.0178	117.05
92		L.V115		115.00	6	1.0179	117.05	110		PTMD115A		115.00	6	1.0191	117.20
111		PTMD115B		115.00	6	1.0191	117.20	123		MIR115		115.00	7	1.0015	115.17



*Handwritten signature or initials.*



AREA 6 [PANAMA ] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING	
66		BLM13B		13.800	V2	37.0	7.7	17.0	0.0	1.0000	37.8	0.9791	47.0			1	6		
67		BLM13C		13.800	V3	37.0	7.7	17.0	0.0	1.0000	37.8	0.9791	47.0			1	6		
68		BLM13D		13.800	V4	37.0	7.9	30.0	0.0	1.0000	37.8	0.9778	47.0			1	6		
70		TGJB13A		13.800	J5	30.0	5.6	20.0	0.0	1.0000	30.5	0.9833	39.4			1	6		
71		TGJB13B		13.800	J6	30.0	5.6	20.0	0.0	1.0000	30.5	0.9833	39.4			1	6		
73		BLMCCB		13.800	V9	20.0	7.2	40.0	0.0	1.0000	21.2	0.9416	71.0			1	6		
90		EST-13L		13.800	E1	22.0	-1.9	12.0	-5.0	0.9600	23.0	0.9963	27.0			1	6		
91		EST-13T		13.800	E2	22.0	-1.9	12.0	-5.0	0.9600	23.0	0.9963	27.0			1	6		
94		LV-13.8L		13.800	L1	24.0	-1.9	12.0	-5.0	0.9600	25.1	0.9969	27.0			1	6		
95		LV-13.8T		13.800	L2	24.0	1.4	12.0	-5.0	0.9700	24.8	0.9984	27.0			1	6		
97		FOR13A		13.800	F1	80.0	-40.1	50.0	-50.0	0.9800	91.3	0.8938	111.0			1	6		
98		FOR13B		13.800	F2	80.0	-40.1	50.0	-50.0	0.9800	91.3	0.8938	111.0			1	6		
101		BAY13A		13.800	B1	67.8	27.0	50.0	-25.0	1.0000	73.0	0.9289	96.0			1	6	SYST	
102		BAY13B		13.800	B2	67.8	27.0	50.0	-25.0	1.0000	73.0	0.9289	96.0			1	6		
106		PANAM13A		13.800	M1	13.5	2.9	9.0	0.0	0.9800	14.1	0.9781	20.7			1	6		
106		PANAM13A		13.800	M2	13.5	2.9	9.0	0.0	0.9800	14.1	0.9781	20.7			1	6		
106		PANAM13A		13.800	M3	13.5	2.9	9.0	0.0	0.9800	14.1	0.9781	20.7			1	6		
107		PANAM13B		13.800	M4	13.5	2.9	9.0	0.0	0.9800	14.1	0.9781	20.7			1	6		
107		PANAM13B		13.800	M5	13.5	2.9	9.0	0.0	0.9800	14.1	0.9781	20.7			1	6		
107		PANAM13B		13.800	M6	13.5	2.9	9.0	0.0	0.9800	14.1	0.9781	20.7			1	6		
108		BAY13C		13.800	B3	67.8	27.0	50.0	-25.0	1.0000	73.0	0.9289	100.0			1	6		
116		PACORA13		13.800	P1	14.0	3.3	8.8	0.0	1.0000	14.4	0.9729	21.7			1	6		
116		PACORA13		13.800	P2	14.0	3.3	8.8	0.0	1.0000	14.4	0.9729	21.7			1	6		
116		PACORA13		13.800	P3	14.0	3.3	8.8	0.0	1.0000	14.4	0.9729	21.7			1	6		
142		CANJ13A		13.800	C1	46.0	6.1	29.0	-29.0	0.9783	47.4	0.9913	69.0			1	6		
143		CANJ13B		13.800	C2	46.0	6.1	29.0	-29.0	0.9783	47.4	0.9913	69.0			1	6		
521		TCARIBE	13.813	13.800	G1	15.8	2.2	12.5	0.0	1.0000	16.0	0.9903	20.9			1	6		
521		TCARIBE	13.813	13.800	G2	15.8	2.2	12.5	0.0	1.0000	16.0	0.9903	20.9			1	6		
521		TCARIBE	13.813	13.800	G3	15.8	2.2	12.5	0.0	1.0000	16.0	0.9903	20.9			1	6		
523		TBALBOA	13A	13.800	G1	8.2	2.0	6.6	-6.6	1.0000	8.4	0.9718	10.9			1	6		
523		TBALBOA	13A	13.800	G2	8.2	2.0	6.6	-6.6	1.0000	8.4	0.9718	10.9			1	6		
523		TBALBOA	13A	13.800	G3	8.2	2.0	6.6	-6.6	1.0000	8.4	0.9718	10.9			1	6		
523		TBALBOA	13A	13.800	G4	8.2	2.0	6.6	-6.6	1.0000	8.4	0.9718	10.9			1	6		
523		TBALBOA	13A	13.800	G5	8.2	2.0	6.6	-6.6	1.0000	8.4	0.9718	10.9			1	6		
524		TBALBOA	13B	13.800	10	8.2	2.0	6.6	-6.6	1.0000	8.4	0.9718	10.9			1	6		
524		TBALBOA	13B	13.800	G6	8.2	2.0	6.6	-6.6	1.0000	8.4	0.9718	10.9			1	6		
524		TBALBOA	13B	13.800	G7	8.2	2.0	6.6	-6.6	1.0000	8.4	0.9718	10.9			1	6		
524		TBALBOA	13B	13.800	G8	8.2	2.0	6.6	-6.6	1.0000	8.4	0.9718	10.9			1	6		
524		TBALBOA	13B	13.800	G9	8.2	2.0	6.6	-6.6	1.0000	8.4	0.9718	10.9			1	6		
525		TATLANTIC13A	13.800	G1	36.0	7.3	28.5	0.0	1.0000	36.7	0.9798	47.5			1	6			
525		TATLANTIC13A	13.800	G2	36.0	7.3	28.5	0.0	1.0000	36.7	0.9798	47.5			1	6			
526		TATLANTIC13B	13.800	V1	18.3	5.8	15.0	0.0	1.0000	19.2	0.9538	25.0			1	6			
526		TATLANTIC13B	13.800	V2	18.3	5.8	15.0	0.0	1.0000	19.2	0.9538	25.0			1	6			
SUBSYSTEM TOTALS						1099.3	130.2	770.6	-318.6				1557.0						

AREA 7 [ACANAL ] MACHINE SUMMARY:

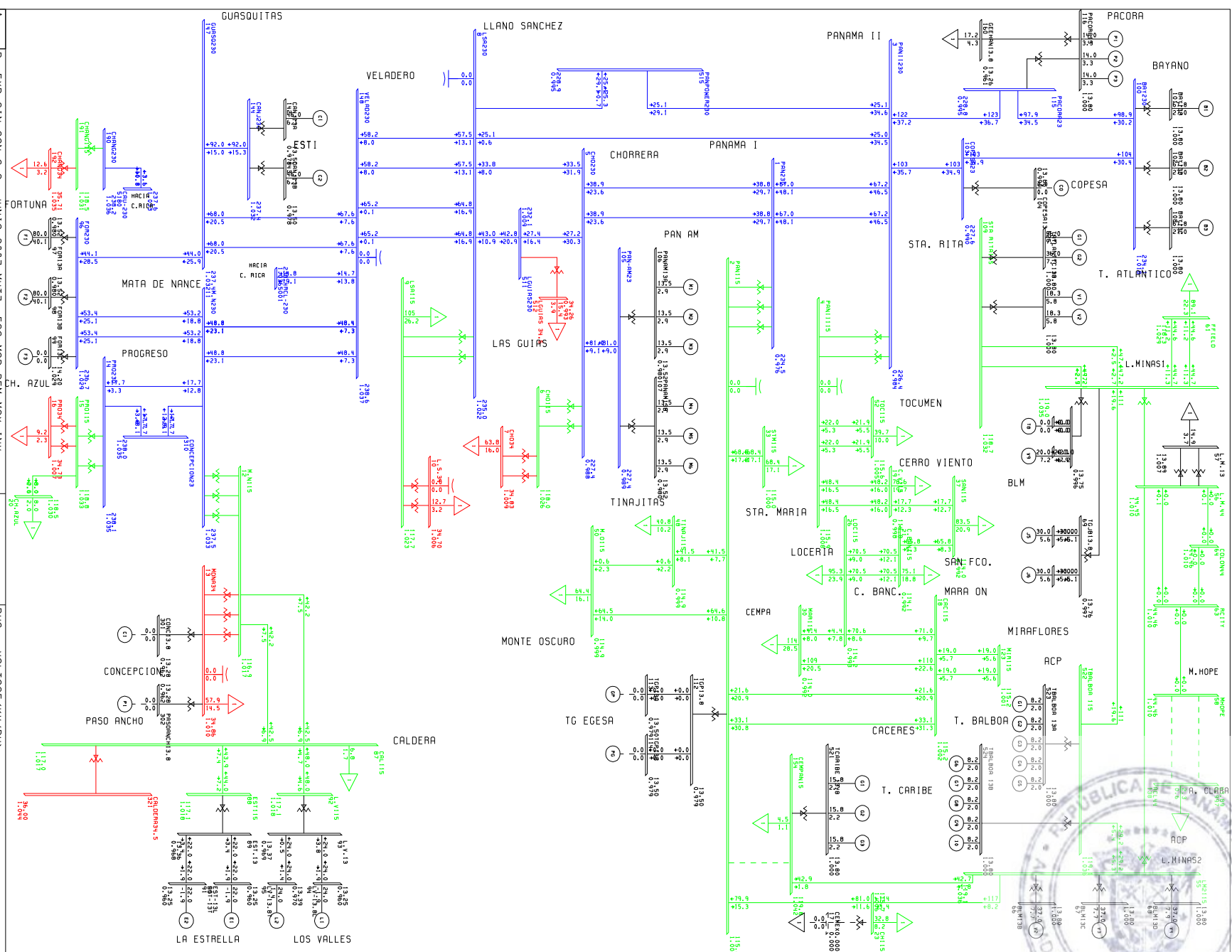


*Handwritten signature or initials.*

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
126	MIR13A	12.000	G1	8.6	0.0	5.0	0.0	1.0438	8.2	1.0000	13.5	2	7					
127	MIR13B	12.000	G2	8.6	0.0	5.0	0.0	1.0438	8.2	1.0000	13.5	2	7					
130	MIR13F	13.800	G5	10.7	6.0	8.0	0.0	1.0000	12.3	0.8712	27.7	2	7					
134	MAD6A	6.9000	G1	9.7	1.2	6.0	-6.0	1.0000	9.7	0.9925	13.0	2	7					
135	MAD6B	6.9000	G2	9.7	1.2	6.0	-6.0	1.0000	9.7	0.9925	13.0	2	7					
136	MAD6C	6.9000	G3	9.7	1.2	6.0	-6.0	1.0000	9.7	0.9925	13.0	2	7					
140	GAT6A	6.9000	G1	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9985	4.1	2	7					
140	GAT6A	6.9000	G2	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9985	4.1	2	7					
140	GAT6A	6.9000	G3	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9985	4.1	2	7					
141	GAT6B	6.9000	G4	3.9	-0.6	3.0	-3.0	1.0000	3.9	0.9871	5.6	2	7					
141	GAT6B	6.9000	G5	3.9	-0.6	3.0	-3.0	1.0000	3.9	0.9871	6.2	2	7					
141	GAT6B	6.9000	G6	3.9	-0.6	3.0	-3.0	1.0000	3.9	0.9871	6.2	2	7					
SUBSYSTEM TOTALS						74.3	8.0	51.0	-33.0			124.2						



*Handwritten signature or initials.*



W- EXP-SIN CON C.R. JUNIO 2007 MAT7 ECG MOD GEN MAX INV  
 P. O 2017 ESTUDIOS SUDOS-CONTINENCIAL PAN-CENPAN  
 THU, DEC 27 2007 10:10  
 KW: 419 .435 .4115  
 BUS - VOLTAGE(KV/PU)  
 BRANCH MW/MVAR  
 EQUIPMENT - MW/MVAR

**PLAN DE EXPANSIÓN DEL SIN 2008  
AÑO 2010 ESCENARIO MODERADO DE DEMANDA MÁXIMA INVIERNO  
Contingencia Las Minas 2-Chilibre**



*de*

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
8		LSA230		230.00	6	1.0190	234.37	11		M.N230		230.00	6	1.0316	237.28
14		PRO230		230.00	6	1.0343	237.88	96		FOR230		230.00	6	1.0280	236.43
100		BAY230		230.00	6	1.0156	233.58	144		CANJ230		230.00	6	1.0310	237.14
147		GUASQ230		230.00	6	1.0311	237.16	148		VELAD230		230.00	6	1.0355	238.16
190		CHANG230		230.00	6	1.0350	238.04	310		CONCEPCION230		230.00	6	1.0336	237.72
511		LGUIAS230		230.00	6	1.0059	231.37	6000		FRONTER		230.00	6	1.0348	238.01

BUSES WITH VOLTAGE LESS THAN 1.0200:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
1		PAN230		230.00	6	0.9713	223.40	3		PANII230		230.00	6	0.9803	225.47
5		CHO230		230.00	6	0.9844	226.41	8		LSA230		230.00	6	1.0190	234.37
100		BAY230		230.00	6	1.0156	233.58	103		COPESA23		230.00	6	0.9859	226.76
105		PAN-AM23		230.00	6	0.9845	226.43	115		PACORA23		230.00	6	0.9917	228.10
511		LGUIAS230		230.00	6	1.0059	231.37	515		PANPOWER230		230.00	6	0.9916	228.06

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2		PAN115		115.00	6	1.0071	115.82	4		PANII115		115.00	6	1.0063	115.72
6		CHO115		115.00	6	1.0213	117.45	9		LSA115		115.00	6	1.0204	117.34
12		M.N115		115.00	6	1.0157	116.81	15		PRO115		115.00	6	1.0322	118.71
18		CAC115		115.00	6	1.0066	115.76	20		CH.AZUL		115.00	6	1.0292	118.36
33		STM115		115.00	6	1.0054	115.62	48		TINAJ115		115.00	6	1.0040	115.46
50		M.O115		115.00	6	1.0039	115.45	52		TOC115		115.00	6	1.0035	115.40
54		LM1115		115.00	6	1.0379	119.35	55		LM2115		115.00	6	1.0387	119.46
61		FFIELD		115.00	9	1.0316	118.63	87		CAL115		115.00	6	1.0169	116.94
88		EST115		115.00	6	1.0173	116.99	92		L.V115		115.00	6	1.0173	116.99
109		STA RITA115		115.00	6	1.0352	119.05	110		PTMD115A		115.00	6	1.0228	117.62
111		PTMD115B		115.00	6	1.0228	117.62	123		MIR115		115.00	7	1.0061	115.71
154		CEMPAN15		115.00	6	1.0330	118.80	191		CHANG115		115.00	6	1.0302	118.47
522		TBALBOA	115	115.00	6	1.0385	119.43								

BUSES WITH VOLTAGE LESS THAN 1.0200:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2		PAN115		115.00	6	1.0071	115.82	4		PANII115		115.00	6	1.0063	115.72
12		M.N115		115.00	6	1.0157	116.81	18		CAC115		115.00	6	1.0066	115.76
19		C.V115		115.00	6	0.9981	114.78	21		C.BAN115		115.00	6	0.9966	114.61
23		CH115		115.00	6	0.9956	114.49	26		LOC115		115.00	6	0.9977	114.74
30		MAR115		115.00	6	0.9963	114.58	33		STM115		115.00	6	1.0054	115.62
37		SAN115		115.00	6	0.9955	114.49	48		TINAJ115		115.00	6	1.0040	115.46
50		M.O115		115.00	6	1.0039	115.45	52		TOC115		115.00	6	1.0035	115.40
87		CAL115		115.00	6	1.0169	116.94	88		EST115		115.00	6	1.0173	116.99
92		L.V115		115.00	6	1.0173	116.99	123		MIR115		115.00	7	1.0061	115.71



AREA 6 [PANAMA ] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
66		BLM13B		13.800	V2	37.0	6.4	17.0	0.0	1.0000	37.5	0.9855	47.0			1	6	
67		BLM13C		13.800	V3	37.0	6.4	17.0	0.0	1.0000	37.5	0.9855	47.0			1	6	
68		BLM13D		13.800	V4	37.0	6.5	30.0	0.0	1.0000	37.6	0.9848	47.0			1	6	
70		TGJB13A		13.800	J5	30.0	4.8	20.0	0.0	1.0000	30.4	0.9875	39.4			1	6	
71		TGJB13B		13.800	J6	30.0	4.8	20.0	0.0	1.0000	30.4	0.9875	39.4			1	6	
73		BLMCCB		13.800	V9	20.0	5.8	40.0	0.0	1.0000	20.8	0.9601	71.0			1	6	
90		EST-13L		13.800	E1	22.0	-1.7	12.0	-5.0	0.9600	23.0	0.9969	27.0			1	6	
91		EST-13T		13.800	E2	22.0	-1.7	12.0	-5.0	0.9600	23.0	0.9969	27.0			1	6	
94		LV-13.8L		13.800	L1	24.0	-1.7	12.0	-5.0	0.9600	25.1	0.9974	27.0			1	6	
95		LV-13.8T		13.800	L2	24.0	1.5	12.0	-5.0	0.9700	24.8	0.9980	27.0			1	6	
97		FOR13A		13.800	F1	80.0	-39.2	50.0	-50.0	0.9800	90.9	0.8978	111.0			1	6	
98		FOR13B		13.800	F2	80.0	-39.2	50.0	-50.0	0.9800	90.9	0.8978	111.0			1	6	
101		BAY13A		13.800	B1	67.8	28.7	50.0	-25.0	1.0000	73.6	0.9209	96.0			1	6	SYST
102		BAY13B		13.800	B2	67.8	28.7	50.0	-25.0	1.0000	73.6	0.9209	96.0			1	6	
106		PANAM13A		13.800	M1	13.5	3.4	9.0	0.0	0.9800	14.2	0.9690	20.7			1	6	
106		PANAM13A		13.800	M2	13.5	3.4	9.0	0.0	0.9800	14.2	0.9690	20.7			1	6	
106		PANAM13A		13.800	M3	13.5	3.4	9.0	0.0	0.9800	14.2	0.9690	20.7			1	6	
107		PANAM13B		13.800	M4	13.5	3.4	9.0	0.0	0.9800	14.2	0.9690	20.7			1	6	
107		PANAM13B		13.800	M5	13.5	3.4	9.0	0.0	0.9800	14.2	0.9690	20.7			1	6	
107		PANAM13B		13.800	M6	13.5	3.4	9.0	0.0	0.9800	14.2	0.9690	20.7			1	6	
108		BAY13C		13.800	B3	67.8	28.7	50.0	-25.0	1.0000	73.6	0.9209	100.0			1	6	
116		PACORA13		13.800	P1	14.0	3.9	8.8	0.0	1.0000	14.5	0.9632	21.7			1	6	
116		PACORA13		13.800	P2	14.0	3.9	8.8	0.0	1.0000	14.5	0.9632	21.7			1	6	
116		PACORA13		13.800	P3	14.0	3.9	8.8	0.0	1.0000	14.5	0.9632	21.7			1	6	
142		CANJ13A		13.800	C1	46.0	6.3	29.0	-29.0	0.9783	47.5	0.9908	69.0			1	6	
143		CANJ13B		13.800	C2	46.0	6.3	29.0	-29.0	0.9783	47.5	0.9908	69.0			1	6	
521		TCARIBE	13.813	13.800	G1	15.8	4.0	12.5	0.0	1.0000	16.3	0.9699	20.9			1	6	
521		TCARIBE	13.813	13.800	G2	15.8	4.0	12.5	0.0	1.0000	16.3	0.9699	20.9			1	6	
521		TCARIBE	13.813	13.800	G3	15.8	4.0	12.5	0.0	1.0000	16.3	0.9699	20.9			1	6	
523		TBALBOA	13A	13.800	G1	8.2	1.6	6.6	-6.6	1.0000	8.4	0.9807	10.9			1	6	
523		TBALBOA	13A	13.800	G2	8.2	1.6	6.6	-6.6	1.0000	8.4	0.9807	10.9			1	6	
523		TBALBOA	13A	13.800	G3	8.2	1.6	6.6	-6.6	1.0000	8.4	0.9807	10.9			1	6	
523		TBALBOA	13A	13.800	G4	8.2	1.6	6.6	-6.6	1.0000	8.4	0.9807	10.9			1	6	
523		TBALBOA	13A	13.800	G5	8.2	1.6	6.6	-6.6	1.0000	8.4	0.9807	10.9			1	6	
524		TBALBOA	13B	13.800	10	8.2	1.6	6.6	-6.6	1.0000	8.4	0.9807	10.9			1	6	
524		TBALBOA	13B	13.800	G6	8.2	1.6	6.6	-6.6	1.0000	8.4	0.9807	10.9			1	6	
524		TBALBOA	13B	13.800	G7	8.2	1.6	6.6	-6.6	1.0000	8.4	0.9807	10.9			1	6	
524		TBALBOA	13B	13.800	G8	8.2	1.6	6.6	-6.6	1.0000	8.4	0.9807	10.9			1	6	
524		TBALBOA	13B	13.800	G9	8.2	1.6	6.6	-6.6	1.0000	8.4	0.9807	10.9			1	6	
525		TATLANTIC13A	13.800	G1	36.0	6.5	28.5	0.0	1.0000	36.6	0.9841	47.5			1	6		
525		TATLANTIC13A	13.800	G2	36.0	6.5	28.5	0.0	1.0000	36.6	0.9841	47.5			1	6		
526		TATLANTIC13B	13.800	V1	18.3	4.9	15.0	0.0	1.0000	19.0	0.9655	25.0			1	6		
526		TATLANTIC13B	13.800	V2	18.3	4.9	15.0	0.0	1.0000	19.0	0.9655	25.0			1	6		
SUBSYSTEM TOTALS						1099.3	134.6	770.6	-318.6				1557.0					

AREA 7 [ACANAL ] MACHINE SUMMARY:

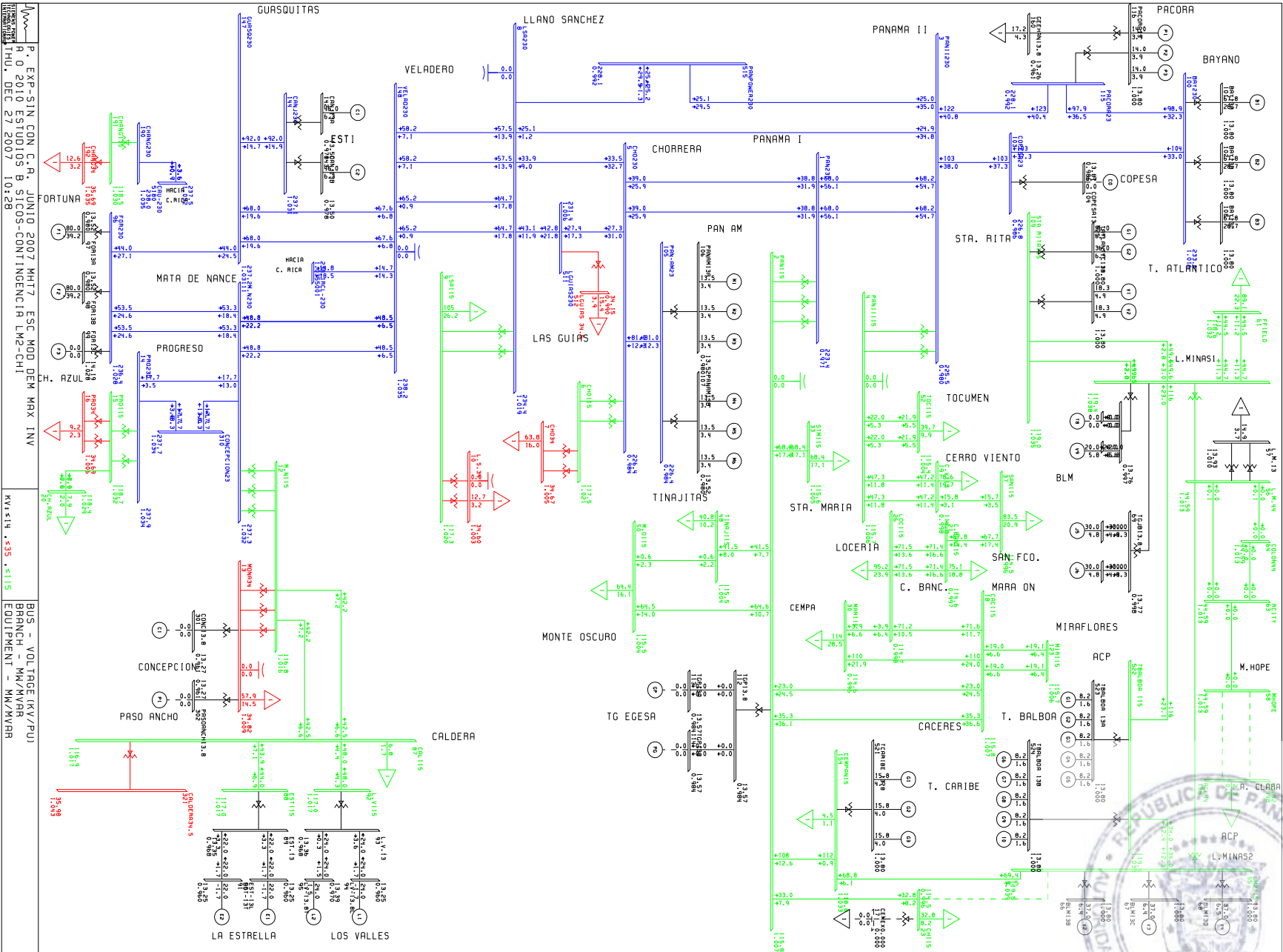


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BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
126	MIR13A	12.000	G1	8.6	0.0	5.0	0.0	1.0462	8.2	1.0000	13.5					2	7	
127	MIR13B	12.000	G2	8.6	0.0	5.0	0.0	1.0462	8.2	1.0000	13.5					2	7	
130	MIR13F	13.800	G5	10.7	4.9	8.0	0.0	1.0000	11.8	0.9075	27.7					2	7	
134	MAD6A	6.9000	G1	9.7	1.1	6.0	-6.0	1.0000	9.7	0.9940	13.0					2	7	
135	MAD6B	6.9000	G2	9.7	1.1	6.0	-6.0	1.0000	9.7	0.9941	13.0					2	7	
136	MAD6C	6.9000	G3	9.7	1.1	6.0	-6.0	1.0000	9.7	0.9941	13.0					2	7	
140	GAT6A	6.9000	G1	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9994	4.1					2	7	
140	GAT6A	6.9000	G2	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9994	4.1					2	7	
140	GAT6A	6.9000	G3	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9994	4.1					2	7	
141	GAT6B	6.9000	G4	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9855	5.6					2	7	
141	GAT6B	6.9000	G5	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9855	6.2					2	7	
141	GAT6B	6.9000	G6	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9855	6.2					2	7	
SUBSYSTEM TOTALS						74.3	6.3	51.0	-33.0			124.2						



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P - EXP-SIN CON C. R. JUNIO 2007 MAT7 - ESC MOD DEM MAX INV  
 R. O. 2010 ESTUDIOS B. SICOS-CONTINGENCIA LM2-CH1  
 THU, DEC 27 2007 10:28

KVA 114 - 335 - 1115

BUS - VOLTAGE (KV/PU)  
 BRANCH - MW/MVAR  
 EQUIPMENT - MW/MVAR



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**PLAN DE EXPANSIÓN DEL SIN 2008**  
**AÑO 2010 ESCENARIO MODERADO DE DEMANDA MÁXIMA INVIERNO**  
**Contingencia Las Minas 1-Santa Rita**



*de*

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
8	LSA230	230.00	6	1.0252	235.80	11	M.N230	230.00	6	1.0342	237.86				
14	PRO230	230.00	6	1.0366	238.42	96	FOR230	230.00	6	1.0302	236.94				
100	BAY230	230.00	6	1.0210	234.83	144	CANJ230	230.00	6	1.0337	237.74				
147	GUASQ230	230.00	6	1.0338	237.76	148	VELAD230	230.00	6	1.0395	239.09				
190	CHANG230	230.00	6	1.0363	238.36	310	CONCEPCION23	230.00	6	1.0360	238.28				
511	LGUIAS230	230.00	6	1.0131	233.02	515	PANPOWER230	230.00	6	1.0004	230.09				
6000	FRONTER	230.00	6	1.0371	238.53										

BUSES WITH VOLTAGE LESS THAN 1.0200:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
1	PAN230	230.00	6	0.9816	225.76	3	PANII230	230.00	6	0.9896	227.61				
5	CHO230	230.00	6	0.9929	228.36	103	COPESA23	230.00	6	0.9946	228.77				
105	PAN-AM23	230.00	6	0.9929	228.37	115	PACORA23	230.00	6	0.9994	229.87				
511	LGUIAS230	230.00	6	1.0131	233.02	515	PANPOWER230	230.00	6	1.0004	230.09				

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2	PAN115	115.00	6	1.0079	115.90	4	PANII115	115.00	6	1.0044	115.51				
6	CHO115	115.00	6	1.0303	118.48	9	LSA115	115.00	6	1.0269	118.09				
12	M.N115	115.00	6	1.0176	117.03	15	PRO115	115.00	6	1.0346	118.98				
18	CAC115	115.00	6	1.0074	115.85	20	CH.AZUL	115.00	6	1.0316	118.63				
23	CH115	115.00	6	1.0117	116.34	33	STM115	115.00	6	1.0061	115.70				
48	TINAJ115	115.00	6	1.0047	115.54	50	M.O115	115.00	6	1.0046	115.53				
52	TOC115	115.00	6	1.0017	115.19	54	LM1115	115.00	6	1.0365	119.19				
55	LM2115	115.00	6	1.0367	119.23	61	FFIELD	115.00	9	1.0302	118.47				
87	CAL115	115.00	6	1.0182	117.09	88	EST115	115.00	6	1.0184	117.12				
92	L.V115	115.00	6	1.0185	117.13	109	STA RITA115	115.00	6	1.0342	118.93				
110	PTMD115A	115.00	6	1.0234	117.69	111	PTMD115B	115.00	6	1.0234	117.69				
123	MIR115	115.00	7	1.0068	115.78	154	CEMPAN15	115.00	6	1.0334	118.84				
191	CHANG115	115.00	6	1.0316	118.63	522	TBALBOA 115	115.00	6	1.0368	119.24				

BUSES WITH VOLTAGE LESS THAN 1.0200:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2	PAN115	115.00	6	1.0079	115.90	4	PANII115	115.00	6	1.0044	115.51				
12	M.N115	115.00	6	1.0176	117.03	18	CAC115	115.00	6	1.0074	115.85				
19	C.V115	115.00	6	0.9969	114.65	21	C.BAN115	115.00	6	0.9970	114.66				
23	CH115	115.00	6	1.0117	116.34	26	LOC115	115.00	6	0.9982	114.79				
30	MAR115	115.00	6	0.9969	114.64	33	STM115	115.00	6	1.0061	115.70				
37	SAN115	115.00	6	0.9958	114.52	48	TINAJ115	115.00	6	1.0047	115.54				
50	M.O115	115.00	6	1.0046	115.53	52	TOC115	115.00	6	1.0017	115.19				
87	CAL115	115.00	6	1.0182	117.09	88	EST115	115.00	6	1.0184	117.12				
92	L.V115	115.00	6	1.0185	117.13	123	MIR115	115.00	7	1.0068	115.78				



*Handwritten signature or initials.*

AREA 6 [PANAMA ] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
66		BLM13B		13.800	V2	37.0	7.2	17.0	0.0	1.0000	37.7	0.9815	47.0			1	6	
67		BLM13C		13.800	V3	37.0	7.2	17.0	0.0	1.0000	37.7	0.9815	47.0			1	6	
68		BLM13D		13.800	V4	37.0	7.4	30.0	0.0	1.0000	37.7	0.9804	47.0			1	6	
70		TGJB13A		13.800	J5	30.0	5.1	20.0	0.0	1.0000	30.4	0.9856	39.4			1	6	
71		TGJB13B		13.800	J6	30.0	5.1	20.0	0.0	1.0000	30.4	0.9856	39.4			1	6	
73		BLMCCB		13.800	V9	20.0	6.4	40.0	0.0	1.0000	21.0	0.9519	71.0			1	6	
90		EST-13L		13.800	E1	22.0	-2.1	12.0	-5.0	0.9600	23.0	0.9957	27.0			1	6	
91		EST-13T		13.800	E2	22.0	-2.1	12.0	-5.0	0.9600	23.0	0.9957	27.0			1	6	
94		LV-13.8L		13.800	L1	24.0	-2.1	12.0	-5.0	0.9600	25.1	0.9962	27.0			1	6	
95		LV-13.8T		13.800	L2	24.0	1.2	12.0	-5.0	0.9700	24.8	0.9988	27.0			1	6	
97		FOR13A		13.800	F1	80.0	-41.2	50.0	-50.0	0.9800	91.8	0.8890	111.0			1	6	
98		FOR13B		13.800	F2	80.0	-41.2	50.0	-50.0	0.9800	91.8	0.8890	111.0			1	6	
101		BAY13A		13.800	B1	67.8	24.6	50.0	-25.0	1.0000	72.1	0.9398	96.0			1	6	SYST
102		BAY13B		13.800	B2	67.8	24.6	50.0	-25.0	1.0000	72.1	0.9398	96.0			1	6	
106		PANAM13A		13.800	M1	13.5	2.3	9.0	0.0	0.9800	14.0	0.9862	20.7			1	6	
106		PANAM13A		13.800	M2	13.5	2.3	9.0	0.0	0.9800	14.0	0.9862	20.7			1	6	
106		PANAM13A		13.800	M3	13.5	2.3	9.0	0.0	0.9800	14.0	0.9862	20.7			1	6	
107		PANAM13B		13.800	M4	13.5	2.3	9.0	0.0	0.9800	14.0	0.9862	20.7			1	6	
107		PANAM13B		13.800	M5	13.5	2.3	9.0	0.0	0.9800	14.0	0.9862	20.7			1	6	
107		PANAM13B		13.800	M6	13.5	2.3	9.0	0.0	0.9800	14.0	0.9862	20.7			1	6	
108		BAY13C		13.800	B3	67.8	24.6	50.0	-25.0	1.0000	72.1	0.9398	100.0			1	6	
116		PACORA13		13.800	P1	14.0	2.5	8.8	0.0	1.0000	14.2	0.9841	21.7			1	6	
116		PACORA13		13.800	P2	14.0	2.5	8.8	0.0	1.0000	14.2	0.9841	21.7			1	6	
116		PACORA13		13.800	P3	14.0	2.5	8.8	0.0	1.0000	14.2	0.9841	21.7			1	6	
142		CANJ13A		13.800	C1	46.0	5.9	29.0	-29.0	0.9783	47.4	0.9920	69.0			1	6	
143		CANJ13B		13.800	C2	46.0	5.9	29.0	-29.0	0.9783	47.4	0.9920	69.0			1	6	
521		TCARIBE	13.813	13.800	G1	15.8	3.9	12.5	0.0	1.0000	16.3	0.9710	20.9			1	6	
521		TCARIBE	13.813	13.800	G2	15.8	3.9	12.5	0.0	1.0000	16.3	0.9710	20.9			1	6	
521		TCARIBE	13.813	13.800	G3	15.8	3.9	12.5	0.0	1.0000	16.3	0.9710	20.9			1	6	
523		TBALBOA	13A	13.800	G1	8.2	1.8	6.6	-6.6	1.0000	8.4	0.9759	10.9			1	6	
523		TBALBOA	13A	13.800	G2	8.2	1.8	6.6	-6.6	1.0000	8.4	0.9759	10.9			1	6	
523		TBALBOA	13A	13.800	G3	8.2	1.8	6.6	-6.6	1.0000	8.4	0.9759	10.9			1	6	
523		TBALBOA	13A	13.800	G4	8.2	1.8	6.6	-6.6	1.0000	8.4	0.9759	10.9			1	6	
523		TBALBOA	13A	13.800	G5	8.2	1.8	6.6	-6.6	1.0000	8.4	0.9759	10.9			1	6	
524		TBALBOA	13B	13.800	10	8.2	1.8	6.6	-6.6	1.0000	8.4	0.9759	10.9			1	6	
524		TBALBOA	13B	13.800	G6	8.2	1.8	6.6	-6.6	1.0000	8.4	0.9759	10.9			1	6	
524		TBALBOA	13B	13.800	G7	8.2	1.8	6.6	-6.6	1.0000	8.4	0.9759	10.9			1	6	
524		TBALBOA	13B	13.800	G8	8.2	1.8	6.6	-6.6	1.0000	8.4	0.9759	10.9			1	6	
524		TBALBOA	13B	13.800	G9	8.2	1.8	6.6	-6.6	1.0000	8.4	0.9759	10.9			1	6	
525		TATLANTIC13A	13.800	G1	36.0	6.8	28.5	0.0	1.0000	36.6	0.9826	47.5			1	6		
525		TATLANTIC13A	13.800	G2	36.0	6.8	28.5	0.0	1.0000	36.6	0.9826	47.5			1	6		
526		TATLANTIC13B	13.800	V1	18.3	5.2	15.0	0.0	1.0000	19.0	0.9616	25.0			1	6		
526		TATLANTIC13B	13.800	V2	18.3	5.2	15.0	0.0	1.0000	19.0	0.9616	25.0			1	6		
SUBSYSTEM TOTALS						1099.3	112.1	770.6	-318.6				1557.0					

AREA 7 [ACANAL ] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
------	-----	------	-----	-------	----	----	------	------	------	-------	---------	----	---------	-----------	--------	------	------	-------



*Handwritten signature or mark.*

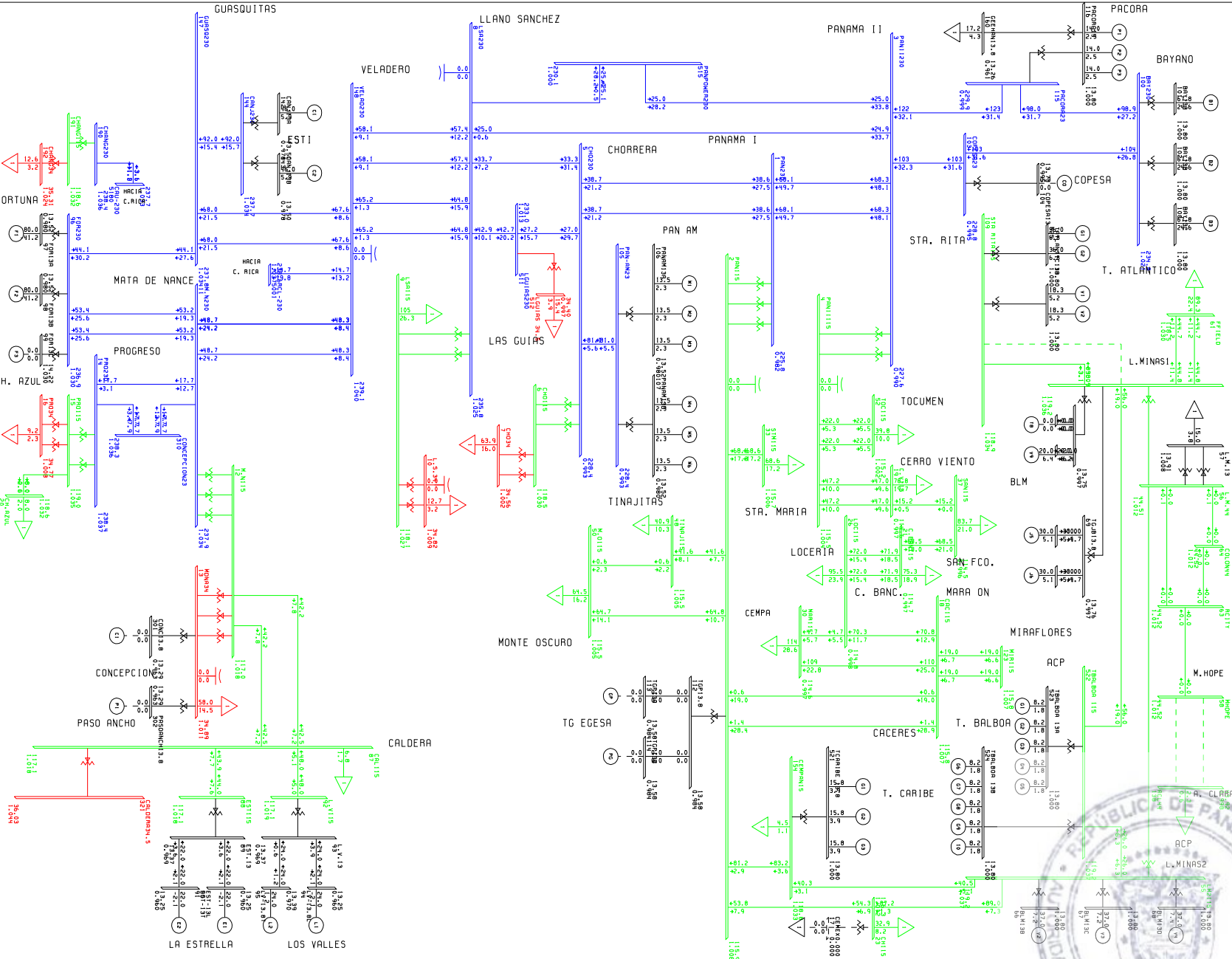
126	MIR13A	12.000	G1	8.6	0.0	5.0	0.0	1.0466	8.2	1.0000	13.5	2	7
127	MIR13B	12.000	G2	8.6	0.0	5.0	0.0	1.0466	8.2	1.0000	13.5	2	7
130	MIR13F	13.800	G5	10.7	4.8	8.0	0.0	1.0000	11.7	0.9125	27.7	2	7
134	MAD6A	6.9000	G1	9.7	1.0	6.0	-6.0	1.0000	9.7	0.9943	13.0	2	7
135	MAD6B	6.9000	G2	9.7	1.0	6.0	-6.0	1.0000	9.7	0.9943	13.0	2	7
136	MAD6C	6.9000	G3	9.7	1.0	6.0	-6.0	1.0000	9.7	0.9943	13.0	2	7
140	GAT6A	6.9000	G1	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9994	4.1	2	7
140	GAT6A	6.9000	G2	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9994	4.1	2	7
140	GAT6A	6.9000	G3	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9994	4.1	2	7
141	GAT6B	6.9000	G4	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9853	5.6	2	7
141	GAT6B	6.9000	G5	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9853	6.2	2	7
141	GAT6B	6.9000	G6	3.9	-0.7	3.0	-3.0	1.0000	3.9	0.9853	6.2	2	7
SUBSYSTEM TOTALS				74.3	6.1	51.0	-33.0				124.2		



*Handwritten signature or initials.*

P. EXP-SIN CON C. R. JUNIO 2007 MH17. ESC. MOD. DEM. MAX. INV.  
 A. O. 2010 ESTUDIOS B. SICOS-CONTINENCIA LMI-STA. RITA  
 TUU, DEC 27 2007 10:34

KW15H - 355 - 5115  
 BUS - VOLTAGE (KV/PU)  
 BRANCH - MW/MVAR  
 EQUIPMENT - VM/MVAR



Handwritten initials or signature.

**PLAN DE EXPANSIÓN DEL SIN CON CENTROAMÉRICA 2008  
AÑO 2011 ESCENARIO MODERADO DE DEMANDA MÁXIMA INVIERNO  
Estudios Básicos**



*de*

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E THU, DEC 27 2007 10:51  
 P. EXP-SIN CON C.A. JUNIO 2007  
 AÑO 2011 ESTUDIOS BÁSICOS ESC MOD DEM MAX INV

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
8	LSA230	230.00	6	1.0201	234.61	11	M.N230	230.00	6	1.0332	237.63				
14	PRO230	230.00	6	1.0353	238.11	96	FOR230	230.00	6	1.0263	236.06				
100	BAY230	230.00	6	1.0085	231.95	144	CANJ230	230.00	6	1.0308	237.09				
147	GUASQ230	230.00	6	1.0307	237.06	148	VELAD230	230.00	6	1.0354	238.13				
190	CHANG230	230.00	6	1.0256	235.89	306	CHANG75	230.00	6	1.0253	235.81				
310	CONCEPCION230	230.00	6	1.0348	238.01	511	LGUIAS230	230.00	6	1.0086	231.97				
6000	FRONTER	230.00	6	1.0356	238.19										

BUSES WITH VOLTAGE LESS THAN 1.0200:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
1	PAN230	230.00	6	0.9773	224.78	3	PANII230	230.00	6	0.9854	226.65				
5	CHO230	230.00	6	0.9897	227.63	100	BAY230	230.00	6	1.0085	231.95				
103	COPESA23	230.00	6	0.9894	227.55	105	PAN-AM23	230.00	6	0.9898	227.66				
115	PACORA23	230.00	6	0.9922	228.21	511	LGUIAS230	230.00	6	1.0086	231.97				
515	PANPOWER230	230.00	6	0.9958	229.03										

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E THU, DEC 27 2007 10:51  
 P. EXP-SIN CON C.A. JUNIO 2007  
 AÑO 2011 ESTUDIOS BÁSICOS ESC MOD DEM MAX INV

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2	PAN115	115.00	6	1.0161	116.86	4	PANII115	115.00	6	1.0162	116.86				
6	CHO115	115.00	6	1.0274	118.15	9	LSA115	115.00	6	1.0222	117.56				
12	M.N115	115.00	6	1.0295	118.39	15	PRO115	115.00	6	1.0334	118.84				
18	CAC115	115.00	6	1.0156	116.79	19	C.V115	115.00	6	1.0078	115.90				
20	CH.AZUL	115.00	6	1.0304	118.50	21	C.BAN115	115.00	6	1.0060	115.69				
23	CH115	115.00	6	1.0190	117.18	26	LOC115	115.00	6	1.0071	115.82				
30	MAR115	115.00	6	1.0056	115.64	33	STM115	115.00	6	1.0145	116.66				
37	SAN115	115.00	6	1.0049	115.57	48	TINAJ115	115.00	6	1.0128	116.47				
50	M.O115	115.00	6	1.0129	116.48	52	TOC115	115.00	6	1.0135	116.55				
54	LM115	115.00	6	1.0402	119.62	55	LM2115	115.00	6	1.0407	119.68				
61	FFIELD	115.00	9	1.0340	118.91	87	CAL115	115.00	6	1.0430	119.94				
88	EST115	115.00	6	1.0461	120.30	92	L.V115	115.00	6	1.0442	120.08				
109	STA RITA115	115.00	6	1.0367	119.22	123	MIR115	115.00	7	1.0145	116.67				
154	CEMPAN15	115.00	6	1.0379	119.36	191	CHANG115	115.00	6	1.0209	117.41				
522	TBALBOA 115	115.00	6	1.0407	119.68										

BUSES WITH VOLTAGE LESS THAN 1.0200:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2	PAN115	115.00	6	1.0161	116.86	4	PANII115	115.00	6	1.0162	116.86				
18	CAC115	115.00	6	1.0156	116.79	19	C.V115	115.00	6	1.0078	115.90				
21	C.BAN115	115.00	6	1.0060	115.69	23	CH115	115.00	6	1.0190	117.18				
26	LOC115	115.00	6	1.0071	115.82	30	MAR115	115.00	6	1.0056	115.64				
33	STM115	115.00	6	1.0145	116.66	37	SAN115	115.00	6	1.0049	115.57				
48	TINAJ115	115.00	6	1.0128	116.47	50	M.O115	115.00	6	1.0129	116.48				
52	TOC115	115.00	6	1.0135	116.55	123	MIR115	115.00	7	1.0145	116.67				



AREA 6 [PANAMA] MACHINE SUMMARY:

BUS#	X-- NAME	--X BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
66	BLM13B	13.800	V2	38.0	10.2	17.0	0.0	1.0100	38.9	0.9661	47.0			1	6	
67	BLM13C	13.800	V3	38.0	10.2	17.0	0.0	1.0100	38.9	0.9661	47.0			1	6	
68	BLM13D	13.800	V4	38.0	10.5	30.0	0.0	1.0100	39.0	0.9637	47.0			1	6	
70	TGJB13A	13.800	J5	31.0	7.0	20.0	0.0	1.0100	31.5	0.9754	39.4			1	6	
71	TGJB13B	13.800	J6	31.0	7.0	20.0	0.0	1.0100	31.5	0.9754	39.4			1	6	
72	BLMCCA	13.800	T8	31.0	7.9	20.0	0.0	1.0100	31.7	0.9687	50.0			1	6	
73	BLMCCB	13.800	V9	47.0	8.3	40.0	0.0	1.0100	47.2	0.9849	71.0			1	6	
90	EST-13L	13.800	E1	22.0	5.0	12.0	-5.0	1.0100	22.3	0.9749	27.0			1	6	
91	EST-13T	13.800	E2	22.0	5.0	12.0	-5.0	1.0100	22.3	0.9749	27.0			1	6	
94	LV-13.8L	13.800	L1	24.0	5.7	12.0	-5.0	1.0100	24.4	0.9727	27.0			1	6	
95	LV-13.8T	13.800	L2	24.0	5.7	12.0	-5.0	1.0100	24.4	0.9727	27.0			1	6	
97	FOR13A	13.800	F1	84.0	-45.0	50.0	-50.0	0.9710	98.1	0.8817	111.0			1	6	
98	FOR13B	13.800	F2	84.0	-45.0	50.0	-50.0	0.9710	98.1	0.8817	111.0			1	6	
101	BAY13A	13.800	B1	42.0	16.2	50.0	-25.0	0.9800	45.9	0.9329	96.0			1	6	SYST
102	BAY13B	13.800	B2	40.6	16.1	50.0	-25.0	0.9800	44.6	0.9295	96.0			1	6	
106	PANAM13A	13.800	M1	14.0	4.2	9.0	0.0	0.9900	14.8	0.9578	20.7			1	6	
106	PANAM13A	13.800	M2	14.0	4.2	9.0	0.0	0.9900	14.8	0.9578	20.7			1	6	
106	PANAM13A	13.800	M3	14.0	4.2	9.0	0.0	0.9900	14.8	0.9578	20.7			1	6	
107	PANAM13B	13.800	M4	14.0	4.2	9.0	0.0	0.9900	14.8	0.9578	20.7			1	6	
107	PANAM13B	13.800	M5	14.0	4.2	9.0	0.0	0.9900	14.8	0.9578	20.7			1	6	
107	PANAM13B	13.800	M6	14.0	4.2	9.0	0.0	0.9900	14.8	0.9578	20.7			1	6	
108	BAY13C	13.800	B3	40.6	16.1	50.0	-25.0	0.9800	44.6	0.9295	100.0			1	6	
116	PACORA13	13.800	P1	15.0	8.8	8.8	0.0	0.9892	17.6	0.8618	21.7			1	6	
116	PACORA13	13.800	P2	15.0	8.8	8.8	0.0	0.9892	17.6	0.8618	21.7			1	6	
116	PACORA13	13.800	P3	15.0	8.8	8.8	0.0	0.9892	17.6	0.8618	21.7			1	6	
142	CANJ13A	13.800	C1	40.0	8.0	29.0	-29.0	1.0000	40.8	0.9804	69.0			1	6	
143	CANJ13B	13.800	C2	40.0	8.0	29.0	-29.0	1.0000	40.8	0.9804	69.0			1	6	
303	SIND13.8	13.800	S1	9.0	0.0	50.0	0.0	1.1225	8.0	1.0000	13.5			1	6	
307	CHANG75A	13.800	G1	65.0	-22.0	22.0	-22.0	1.0002	68.6	0.9472	118.6			1	6	
521	TCARIBE	13.813.800	G1	15.6	3.0	12.5	0.0	1.0000	15.9	0.9823	20.9			1	6	
521	TCARIBE	13.813.800	G2	15.6	3.0	12.5	0.0	1.0000	15.9	0.9823	20.9			1	6	
521	TCARIBE	13.813.800	G3	15.6	3.0	12.5	0.0	1.0000	15.9	0.9823	20.9			1	6	
523	TBALBOA	13A 13.800	G1	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9860	10.9			1	6	
523	TBALBOA	13A 13.800	G2	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9860	10.9			1	6	
523	TBALBOA	13A 13.800	G3	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9860	10.9			1	6	
523	TBALBOA	13A 13.800	G4	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9860	10.9			1	6	
523	TBALBOA	13A 13.800	G5	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9860	10.9			1	6	
524	TBALBOA	13B 13.800	10	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9860	10.9			1	6	
524	TBALBOA	13B 13.800	G6	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9860	10.9			1	6	
524	TBALBOA	13B 13.800	G7	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9860	10.9			1	6	
524	TBALBOA	13B 13.800	G8	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9860	10.9			1	6	
524	TBALBOA	13B 13.800	G9	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9860	10.9			1	6	
525	TATLANTIC13A	13.800	G1	36.0	6.1	28.5	0.0	1.0000	36.5	0.9861	47.5			1	6	
525	TATLANTIC13A	13.800	G2	36.0	6.1	28.5	0.0	1.0000	36.5	0.9861	47.5			1	6	
526	TATLANTIC13B	13.800	V1	18.3	4.5	15.0	0.0	1.0000	18.8	0.9712	25.0			1	6	
526	TATLANTIC13B	13.800	V2	18.3	4.5	15.0	0.0	1.0000	18.8	0.9712	25.0			1	6	
SUBSYSTEM TOTALS				1156.6	130.6	862.6	-340.6				1739.1					



*Handwritten signature or initials.*



AREA 7 [ACANAL ] MACHINE SUMMARY:

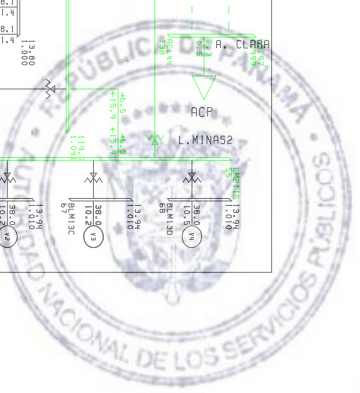
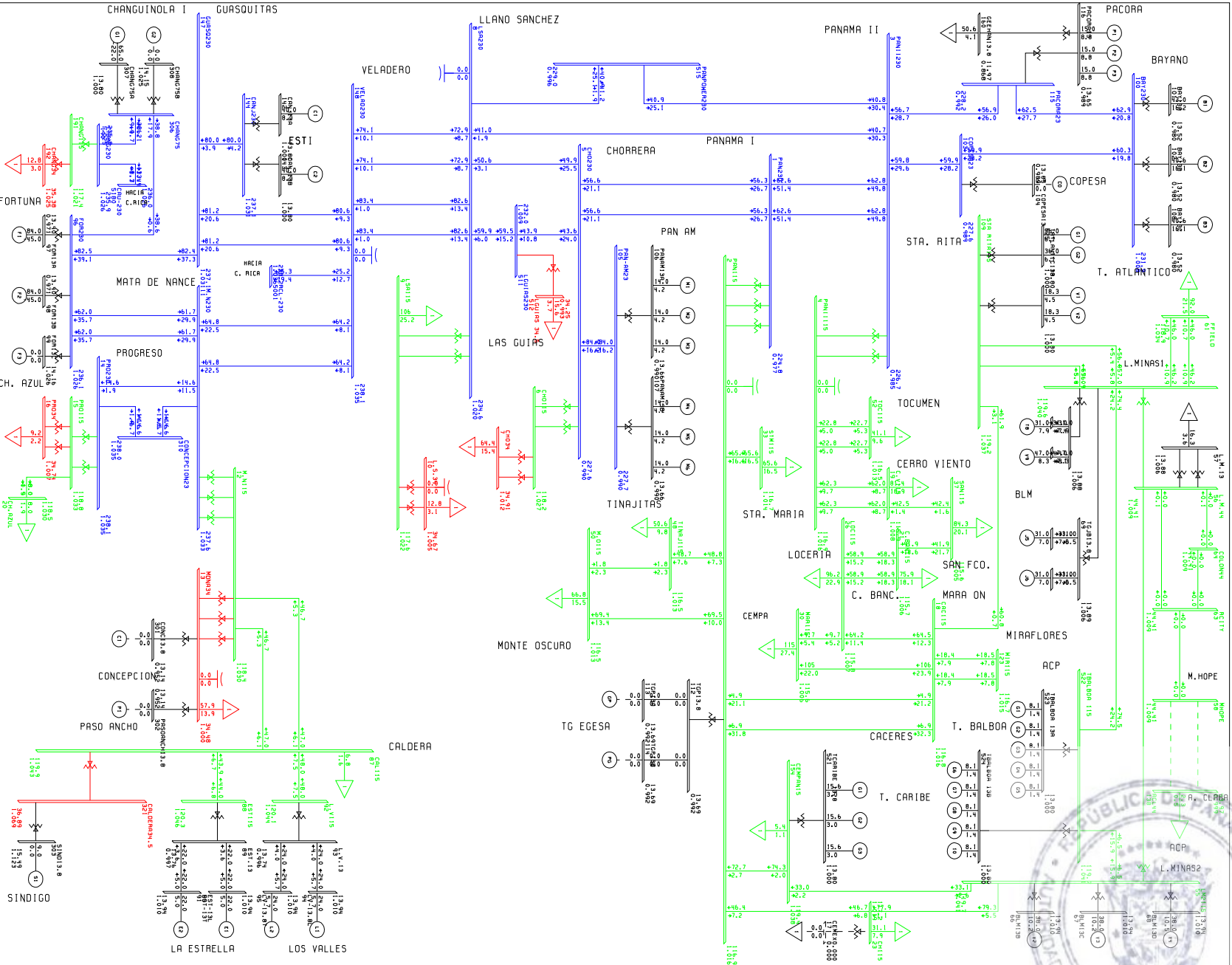
BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING	
126	MIR13A	12.000	G1	8.5	0.0	5.0	0.0	1.0511	8.1	1.0000	13.5				2	7			
127	MIR13B	12.000	G2	8.5	0.0	5.0	0.0	1.0512	8.1	1.0000	13.5				2	7			
130	MIR13F	13.800	G5	10.6	2.8	8.0	0.0	1.0000	11.0	0.9667	27.7				2	7			
134	MAD6A	6.9000	G1	9.6	0.8	6.0	-6.0	1.0000	9.6	0.9966	13.0				2	7			
135	MAD6B	6.9000	G2	9.6	0.8	6.0	-6.0	1.0000	9.6	0.9966	13.0				2	7			
136	MAD6C	6.9000	G3	9.6	0.8	6.0	-6.0	1.0000	9.6	0.9966	13.0				2	7			
140	GAT6A	6.9000	G1	1.9	0.0	2.0	-2.0	1.0000	1.9	1.0000	4.1				2	7			
140	GAT6A	6.9000	G2	1.9	0.0	2.0	-2.0	1.0000	1.9	1.0000	4.1				2	7			
140	GAT6A	6.9000	G3	1.9	0.0	2.0	-2.0	1.0000	1.9	1.0000	4.1				2	7			
141	GAT6B	6.9000	G4	3.8	-0.7	3.0	-3.0	1.0000	3.9	0.9815	5.6				2	7			
141	GAT6B	6.9000	G5	3.8	-0.7	3.0	-3.0	1.0000	3.9	0.9815	6.2				2	7			
141	GAT6B	6.9000	G6	3.8	-0.7	3.0	-3.0	1.0000	3.9	0.9815	6.2				2	7			
SUBSYSTEM TOTALS						73.5	3.0	51.0	-33.0			124.2							



*Handwritten signature or initials.*

P. EXP. SIN CON. C. R. JUNIO 2007 MH7 ESC. MOD. DEM. MAX. INV.  
 R. O. 2011 TBR/BOB. T. CARIBE Y TRLANTICO (EN STR. RITR. 115)  
 T. CARIBE Y TRLANTICO (EN STR. RITR. 115)  
 THU, DEC 27 2007 10:50

KV.114 .435 .1115  
 BUS - VOLTAGE (KV/PU)  
 BRANCH - MW/MVAR  
 EQUIPMENT - MW/MVAR



*Handwritten signature or initials.*

**PLAN DE EXPANSIÓN DEL SIN CON CENTROAMÉRICA 2008  
AÑO 2011 ESCENARIO MODERADO DE DEMANDA MÁXIMA VERANO  
Estudios Básicos**



*de*

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E THU, DEC 27 2007 11:19  
P. EXP-SIN CON C.A. JUNIO 2007  
AÑO 2011 ESTUDIOS BÁSICOS ESC MOD DEM MAX VER

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
8		LSA230		230.00	6	1.0253	235.83	11		M.N230		230.00	6	1.0383	238.81
14		PRO230		230.00	6	1.0399	239.18	96		FOR230		230.00	6	1.0333	237.66
100		BAY230		230.00	6	1.0102	232.36	144		CANJ230		230.00	6	1.0371	238.54
147		GUASQ230		230.00	6	1.0371	238.54	148		VELAD230		230.00	6	1.0413	239.49
190		CHANG230		230.00	6	1.0299	236.88	306		CHANG75		230.00	6	1.0301	236.92
310		CONCEPCION23		230.00	6	1.0397	239.14	511		LGUIAS230		230.00	6	1.0130	232.99
6000		FRONTER		230.00	6	1.0401	239.22								

BUSES WITH VOLTAGE LESS THAN 1.0200:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
1		PAN230		230.00	6	0.9796	225.30	3		PANII230		230.00	6	0.9877	227.17
5		CHO230		230.00	6	0.9926	228.29	100		BAY230		230.00	6	1.0102	232.36
103		COPESA23		230.00	6	0.9915	228.05	105		PAN-AM23		230.00	6	0.9926	228.31
115		PACORA23		230.00	6	0.9943	228.69	511		LGUIAS230		230.00	6	1.0130	232.99
515		PANPOWER230		230.00	6	0.9987	229.69								

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E THU, DEC 27 2007 11:19  
P. EXP-SIN CON C.A. JUNIO 2007  
AÑO 2011 ESTUDIOS BÁSICOS ESC MOD DEM MAX VER

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2		PAN115		115.00	6	1.0182	117.09	4		PANII115		115.00	6	1.0182	117.10
6		CHO115		115.00	6	1.0305	118.50	9		LSA115		115.00	6	1.0278	118.20
12		M.N115		115.00	6	1.0345	118.97	15		PRO115		115.00	6	1.0380	119.37
18		CAC115		115.00	6	1.0176	117.02	19		C.V115		115.00	6	1.0098	116.13
20		CH.AZUL		115.00	6	1.0351	119.04	21		C.BAN115		115.00	6	1.0081	115.93
23		CH115		115.00	6	1.0205	117.36	26		LOC115		115.00	6	1.0091	116.05
30		MAR115		115.00	6	1.0076	115.88	33		STM115		115.00	6	1.0165	116.90
37		SAN115		115.00	6	1.0070	115.80	48		TINAJ115		115.00	6	1.0148	116.70
50		M.O115		115.00	6	1.0149	116.72	52		TOC115		115.00	6	1.0155	116.78
54		LM115		115.00	6	1.0410	119.71	55		LM2115		115.00	6	1.0415	119.77
61		FFIELD		115.00	9	1.0347	119.00	87		CAL115		115.00	6	1.0417	119.80
88		EST115		115.00	6	1.0433	119.98	92		L.V115		115.00	6	1.0423	119.87
109		STA RITA115		115.00	6	1.0376	119.32	123		MIR115		115.00	7	1.0164	116.89
154		CEMPAN15		115.00	6	1.0389	119.47	191		CHANG115		115.00	6	1.0252	117.90
522		TBALBOA 115		115.00	6	1.0414	119.76								

BUSES WITH VOLTAGE LESS THAN 1.0200:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2		PAN115		115.00	6	1.0182	117.09	4		PANII115		115.00	6	1.0182	117.10
18		CAC115		115.00	6	1.0176	117.02	19		C.V115		115.00	6	1.0098	116.13
21		C.BAN115		115.00	6	1.0081	115.93	26		LOC115		115.00	6	1.0091	116.05
30		MAR115		115.00	6	1.0076	115.88	33		STM115		115.00	6	1.0165	116.90
37		SAN115		115.00	6	1.0070	115.80	48		TINAJ115		115.00	6	1.0148	116.70
50		M.O115		115.00	6	1.0149	116.72	52		TOC115		115.00	6	1.0155	116.78
123		MIR115		115.00	7	1.0164	116.89								



PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
P. EXP-SIN CON C.A. JUNIO 2007  
AÑO 2011 ESTUDIOS BÁSICOS ESC MOD DEM MAX VER

THU, DEC 27 2007 11:19

AREA 6 [PANAMA]		] MACHINE SUMMARY:														
BUS#	X-- NAME	--X BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
66	BLM13B	13.800	V2	38.0	9.8	17.0	0.0	1.0100	38.9	0.9681	47.0			1	6	
67	BLM13C	13.800	V3	38.0	9.8	17.0	0.0	1.0100	38.9	0.9681	47.0			1	6	
68	BLM13D	13.800	V4	38.0	10.2	30.0	0.0	1.0100	39.0	0.9659	47.0			1	6	
70	TGJB13A	13.800	J5	31.0	6.8	20.0	0.0	1.0100	31.4	0.9767	39.4			1	6	
71	TGJB13B	13.800	J6	31.0	6.8	20.0	0.0	1.0100	31.4	0.9767	39.4			1	6	
72	BLMCCA	13.800	T8	31.0	7.7	20.0	0.0	1.0100	31.6	0.9702	50.0			1	6	
73	BLMCCB	13.800	V9	47.0	8.1	40.0	0.0	1.0100	47.2	0.9856	71.0			1	6	
90	EST-13L	13.800	E1	15.0	5.7	12.0	-5.0	1.0100	15.9	0.9356	27.0			1	6	
94	LV-13.8L	13.800	L1	17.0	6.1	12.0	-5.0	1.0100	17.9	0.9418	27.0			1	6	
97	FOR13A	13.800	F1	80.0	-26.9	50.0	-50.0	1.0000	84.4	0.9480	111.0			1	6	
98	FOR13B	13.800	F2	80.0	-26.9	50.0	-50.0	1.0000	84.4	0.9480	111.0			1	6	
99	FOR13C	13.800	F3	80.0	-26.9	50.0	-50.0	1.0000	84.4	0.9480	111.0			1	6	
101	BAY13A	13.800	B1	48.8	15.3	50.0	-25.0	0.9800	52.2	0.9541	96.0			1	6	SYST
102	BAY13B	13.800	B2	47.4	15.2	50.0	-25.0	0.9800	50.8	0.9522	96.0			1	6	
106	PANAM13A	13.800	M1	15.0	3.9	9.0	0.0	0.9900	15.7	0.9677	20.7			1	6	
106	PANAM13A	13.800	M2	15.0	3.9	9.0	0.0	0.9900	15.7	0.9677	20.7			1	6	
106	PANAM13A	13.800	M3	15.0	3.9	9.0	0.0	0.9900	15.7	0.9677	20.7			1	6	
107	PANAM13B	13.800	M4	15.0	3.9	9.0	0.0	0.9900	15.7	0.9677	20.7			1	6	
107	PANAM13B	13.800	M5	15.0	3.9	9.0	0.0	0.9900	15.7	0.9677	20.7			1	6	
107	PANAM13B	13.800	M6	15.0	3.9	9.0	0.0	0.9900	15.7	0.9677	20.7			1	6	
108	BAY13C	13.800	B3	47.4	15.2	50.0	-25.0	0.9800	50.8	0.9522	100.0			1	6	
116	PACORA13	13.800	P1	15.0	8.8	8.8	0.0	0.9917	17.6	0.8618	21.7			1	6	
116	PACORA13	13.800	P2	15.0	8.8	8.8	0.0	0.9917	17.6	0.8618	21.7			1	6	
116	PACORA13	13.800	P3	15.0	8.8	8.8	0.0	0.9917	17.6	0.8618	21.7			1	6	
142	CANJ13A	13.800	C1	40.0	7.0	29.0	-29.0	1.0000	40.6	0.9849	69.0			1	6	
303	SIND13.8	13.800	S1	9.0	0.0	50.0	0.0	1.1212	8.0	1.0000	13.5			1	6	
307	CHANG75A	13.800	G1	65.0	-22.0	22.0	-22.0	1.0051	68.3	0.9472	118.6			1	6	
521	TCARIBE	13.813.800	G1	15.6	2.8	12.5	0.0	1.0000	15.8	0.9843	20.9			1	6	
521	TCARIBE	13.813.800	G2	15.6	2.8	12.5	0.0	1.0000	15.8	0.9843	20.9			1	6	
521	TCARIBE	13.813.800	G3	15.6	2.8	12.5	0.0	1.0000	15.8	0.9843	20.9			1	6	
523	TBALBOA	13A 13.800	G1	8.1	1.3	6.6	-6.6	1.0000	8.2	0.9877	10.9			1	6	
523	TBALBOA	13A 13.800	G2	8.1	1.3	6.6	-6.6	1.0000	8.2	0.9877	10.9			1	6	
523	TBALBOA	13A 13.800	G3	8.1	1.3	6.6	-6.6	1.0000	8.2	0.9877	10.9			1	6	
523	TBALBOA	13A 13.800	G4	8.1	1.3	6.6	-6.6	1.0000	8.2	0.9877	10.9			1	6	
523	TBALBOA	13A 13.800	G5	8.1	1.3	6.6	-6.6	1.0000	8.2	0.9877	10.9			1	6	
524	TBALBOA	13B 13.800	G6	8.1	1.3	6.6	-6.6	1.0000	8.2	0.9877	10.9			1	6	
524	TBALBOA	13B 13.800	G7	8.1	1.3	6.6	-6.6	1.0000	8.2	0.9877	10.9			1	6	
524	TBALBOA	13B 13.800	G8	8.1	1.3	6.6	-6.6	1.0000	8.2	0.9877	10.9			1	6	
524	TBALBOA	13B 13.800	G9	8.1	1.3	6.6	-6.6	1.0000	8.2	0.9877	10.9			1	6	
525	TATLANTIC13A13.800	G1	36.0	5.8	28.5	0.0	1.0000	36.5	0.9873	47.5			1	6		
525	TATLANTIC13A13.800	G2	36.0	5.8	28.5	0.0	1.0000	36.5	0.9873	47.5			1	6		
526	TATLANTIC13B13.800	V1	18.3	4.2	15.0	0.0	1.0000	18.8	0.9745	25.0			1	6		
526	TATLANTIC13B13.800	V2	18.3	4.2	15.0	0.0	1.0000	18.8	0.9745	25.0			1	6		
SUBSYSTEM TOTALS				1155.1	112.3	859.6	-351.6				1727.1					

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
P. EXP-SIN CON C.A. JUNIO 2007  
AÑO 2011 ESTUDIOS BÁSICOS ESC MOD DEM MAX VER

THU, DEC 27 2007 11:19

AREA 7 [ACANAL		] MACHINE SUMMARY:														
BUS#	X-- NAME	--X BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING



*Handwritten signature or mark.*

126	MIR13A	12.000	G1	8.5	0.0	5.0	0.0	1.0521	8.1	1.0000	13.5	2	7
127	MIR13B	12.000	G2	8.5	0.0	5.0	0.0	1.0522	8.1	1.0000	13.5	2	7
130	MIR13F	13.800	G5	10.6	2.4	8.0	0.0	1.0000	10.9	0.9759	27.7	2	7
134	MAD6A	6.9000	G1	9.6	0.7	6.0	-6.0	1.0000	9.6	0.9971	13.0	2	7
135	MAD6B	6.9000	G2	9.6	0.7	6.0	-6.0	1.0000	9.6	0.9971	13.0	2	7
136	MAD6C	6.9000	G3	9.6	0.7	6.0	-6.0	1.0000	9.6	0.9971	13.0	2	7
140	GAT6A	6.9000	G1	1.9	0.0	2.0	-2.0	1.0000	1.9	1.0000	4.1	2	7
140	GAT6A	6.9000	G2	1.9	0.0	2.0	-2.0	1.0000	1.9	1.0000	4.1	2	7
140	GAT6A	6.9000	G3	1.9	0.0	2.0	-2.0	1.0000	1.9	1.0000	4.1	2	7
141	GAT6B	6.9000	G4	3.8	-0.8	3.0	-3.0	1.0000	3.9	0.9808	5.6	2	7
141	GAT6B	6.9000	G5	3.8	-0.8	3.0	-3.0	1.0000	3.9	0.9808	6.2	2	7
141	GAT6B	6.9000	G6	3.8	-0.8	3.0	-3.0	1.0000	3.9	0.9808	6.2	2	7
SUBSYSTEM TOTALS				73.5	2.3	51.0	-33.0				124.2		

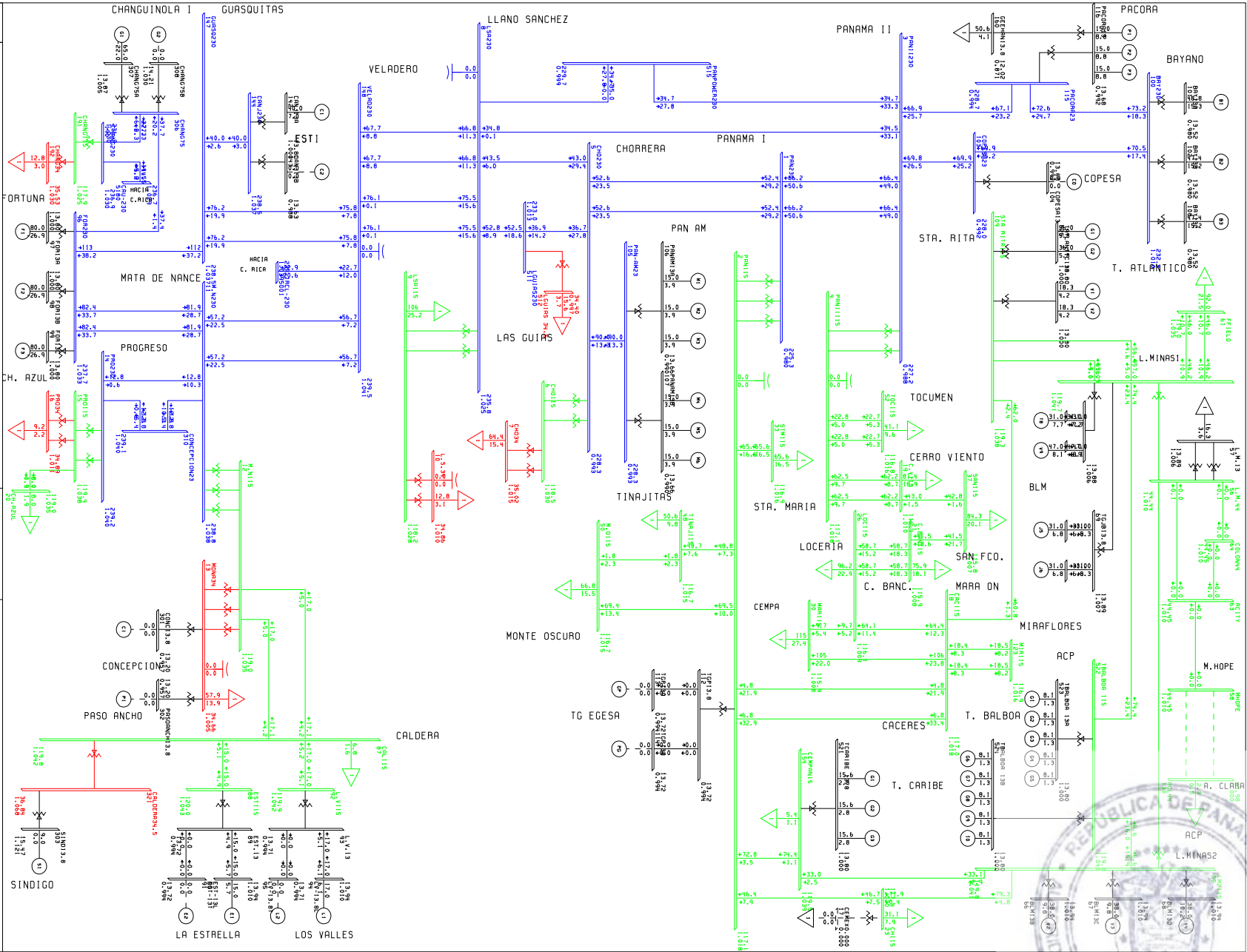


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P - EXP-SIN CON C.A. JUNIO 2007 MAT7 - ESC MOD DEM MAX VER  
 R - 0.2011 TBAUBOR. CARIBE Y ATLANTICO (EN STA RITA 115)  
 THU, DEC 27 2007 11:20

KV:414 .435 .4115

BUS - VOLTAGE (KV/PUI)  
 BRANCH - MW/MVAR  
 EQUIPMENT - MW/MVAR



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**PLAN DE EXPANSIÓN DEL SIN CON CENTROAMÉRICA 2008  
AÑO 2011 ESCENARIO MODERADO DE DEMANDA MÍNIMA VERANO  
Estudios Básicos**



*de*



BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
11	M.	N230		230.00	6	1.0188	234.33	14	PRO	230		230.00	6	1.0227	235.22
96	FOR	230		230.00	6	1.0202	234.65	144	CANJ	230		230.00	6	1.0206	234.74
147	GUASQ	230		230.00	6	1.0205	234.72	148	VELAD	230		230.00	6	1.0140	233.22
190	CHANG	230		230.00	6	1.0227	235.21	306	CHANG	75		230.00	6	1.0216	234.97
310	CONCEPCION	23230		230.00	6	1.0214	234.91	6000	FRONTER			230.00	6	1.0235	235.40

BUSES WITH VOLTAGE LESS THAN 1.0200:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
1	PAN	230		230.00	6	0.9752	224.29	3	PANII	230		230.00	6	0.9804	225.48
5	CHO	230		230.00	6	0.9835	226.22	8	LSA	230		230.00	6	0.9974	229.41
11	M.	N230		230.00	6	1.0188	234.33	100	BAY	230		230.00	6	0.9850	226.55
103	COPESA	230		230.00	6	0.9815	225.75	105	PAN-AM	230		230.00	6	0.9836	226.23
115	PACORA	230		230.00	6	0.9837	226.26	148	VELAD	230		230.00	6	1.0140	233.22
511	LGUIAS	230		230.00	6	0.9938	228.57	515	PANPOWER	230		230.00	6	0.9878	227.19

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2	PAN	115		115.00	6	1.0185	117.12	4	PANII	115		115.00	6	1.0142	116.63
6	CHO	115		115.00	6	1.0244	117.80	15	PRO	115		115.00	6	1.0209	117.40
18	CAC	115		115.00	6	1.0180	117.07	19	C.V	115		115.00	6	1.0097	116.12
20	CH.	AZUL		115.00	6	1.0190	117.18	21	C.BAN	115		115.00	6	1.0112	116.29
23	CH	115		115.00	6	1.0207	117.38	26	LOC	115		115.00	6	1.0121	116.39
30	MAR	115		115.00	6	1.0113	116.30	33	STM	115		115.00	6	1.0174	117.00
37	SAN	115		115.00	6	1.0102	116.17	48	TINAJ	115		115.00	6	1.0164	116.88
50	M.O	115		115.00	6	1.0164	116.88	52	TOC	115		115.00	6	1.0123	116.41
54	LM	115		115.00	6	1.0329	118.78	55	LM	2115		115.00	6	1.0336	118.87
61	FF	FIELD		115.00	9	1.0285	118.28	87	CAL	115		115.00	6	1.0032	115.37
88	EST	115		115.00	6	1.0046	115.53	92	L.V	115		115.00	6	1.0037	115.43
109	STA	RITA	115	115.00	6	1.0310	118.57	123	MIR	115		115.00	7	1.0164	116.89
154	CEMPAN	115		115.00	6	1.0342	118.93	191	CHANG	115		115.00	6	1.0185	117.13
522	TBALBOA	115		115.00	6	1.0334	118.84								

BUSES WITH VOLTAGE LESS THAN 1.0200:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2	PAN	115		115.00	6	1.0185	117.12	4	PANII	115		115.00	6	1.0142	116.63
9	LSA	115		115.00	6	0.9876	113.58	12	M.N	115		115.00	6	0.9971	114.67
18	CAC	115		115.00	6	1.0180	117.07	19	C.V	115		115.00	6	1.0097	116.12
20	CH.	AZUL		115.00	6	1.0190	117.18	21	C.BAN	115		115.00	6	1.0112	116.29
26	LOC	115		115.00	6	1.0121	116.39	30	MAR	115		115.00	6	1.0113	116.30
33	STM	115		115.00	6	1.0174	117.00	37	SAN	115		115.00	6	1.0102	116.17
48	TINAJ	115		115.00	6	1.0164	116.88	50	M.O	115		115.00	6	1.0164	116.88
52	TOC	115		115.00	6	1.0123	116.41	87	CAL	115		115.00	6	1.0032	115.37
88	EST	115		115.00	6	1.0046	115.53	92	L.V	115		115.00	6	1.0037	115.43
123	MIR	115		115.00	7	1.0164	116.89	191	CHANG	115		115.00	6	1.0185	117.13



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PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
 P. EXP-SIN CON C.A. JUNIO 2007  
 AÑO 2011 ESTUDIOS BÁSICOS ESC MOD DEM MIN VER

THU, DEC 27 2007 11:23

AREA 6 [PANAMA ] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
66		BLM13B		13.800	V2	24.0	7.7	17.0	0.0	1.0000	25.2	0.9527	47.0			1	6	
67		BLM13C		13.800	V3	24.0	7.7	17.0	0.0	1.0000	25.2	0.9527	47.0			1	6	
68		BLM13D		13.800	V4	24.0	8.0	30.0	0.0	1.0000	25.3	0.9488	47.0			1	6	
90		EST-13L		13.800	E1	15.0	4.5	12.0	-5.0	0.9700	16.1	0.9576	27.0			1	6	
94		LV-13.8L		13.800	L1	17.0	4.9	12.0	-5.0	0.9700	18.2	0.9612	27.0			1	6	
97		FOR13A		13.800	F1	59.9	-16.4	50.0	-50.0	1.0000	62.1	0.9643	111.0			1	6	SYST
106		PANAM13A		13.800	M1	14.0	5.1	9.0	0.0	0.9900	15.0	0.9402	20.7			1	6	
106		PANAM13A		13.800	M2	14.0	5.1	9.0	0.0	0.9900	15.0	0.9402	20.7			1	6	
106		PANAM13A		13.800	M3	14.0	5.1	9.0	0.0	0.9900	15.0	0.9402	20.7			1	6	
116		PACORA13		13.800	P1	15.0	8.0	8.8	0.0	1.0000	17.0	0.8814	21.7			1	6	
116		PACORA13		13.800	P2	15.0	8.0	8.8	0.0	1.0000	17.0	0.8814	21.7			1	6	
142		CANJ13A		13.800	C1	45.0	11.1	29.0	-29.0	1.0000	46.3	0.9710	69.0			1	6	
307		CHANG75A		13.800	G1	60.0	-22.0	22.0	-22.0	0.9968	64.1	0.9389	118.6			1	6	
521		TCARIBE	13.813	13.800	G1	10.0	4.9	12.5	0.0	1.0000	11.1	0.8995	20.9			1	6	
521		TCARIBE	13.813	13.800	G2	10.0	4.9	12.5	0.0	1.0000	11.1	0.8995	20.9			1	6	
523		TBALBOA	13A	13.800	G1	4.6	2.5	6.6	-6.6	1.0000	5.2	0.8764	10.9			1	6	
523		TBALBOA	13A	13.800	G2	4.6	2.5	6.6	-6.6	1.0000	5.2	0.8764	10.9			1	6	
523		TBALBOA	13A	13.800	G3	4.6	2.5	6.6	-6.6	1.0000	5.2	0.8764	10.9			1	6	
523		TBALBOA	13A	13.800	G4	4.6	2.5	6.6	-6.6	1.0000	5.2	0.8764	10.9			1	6	
524		TBALBOA	13B	13.800	G6	4.6	2.5	6.6	-6.6	1.0000	5.2	0.8764	10.9			1	6	
524		TBALBOA	13B	13.800	G7	4.6	2.5	6.6	-6.6	1.0000	5.2	0.8764	10.9			1	6	
524		TBALBOA	13B	13.800	G8	4.6	2.5	6.6	-6.6	1.0000	5.2	0.8764	10.9			1	6	
524		TBALBOA	13B	13.800	G9	4.6	2.5	6.6	-6.6	1.0000	5.2	0.8764	10.9			1	6	
525		TATLANTIC13A	13.800	G1	18.0	0.0	28.5	0.0	0.9815	18.3	1.0000	47.5			1	6		
526		TATLANTIC13B	13.800	V1	19.2	11.5	15.0	0.0	1.0000	22.4	0.8572	25.0			1	6		
SUBSYSTEM TOTALS						434.9	78.1	354.6	-163.5				800.8					

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
 P. EXP-SIN CON C.A. JUNIO 2007  
 AÑO 2011 ESTUDIOS BÁSICOS ESC MOD DEM MIN VER

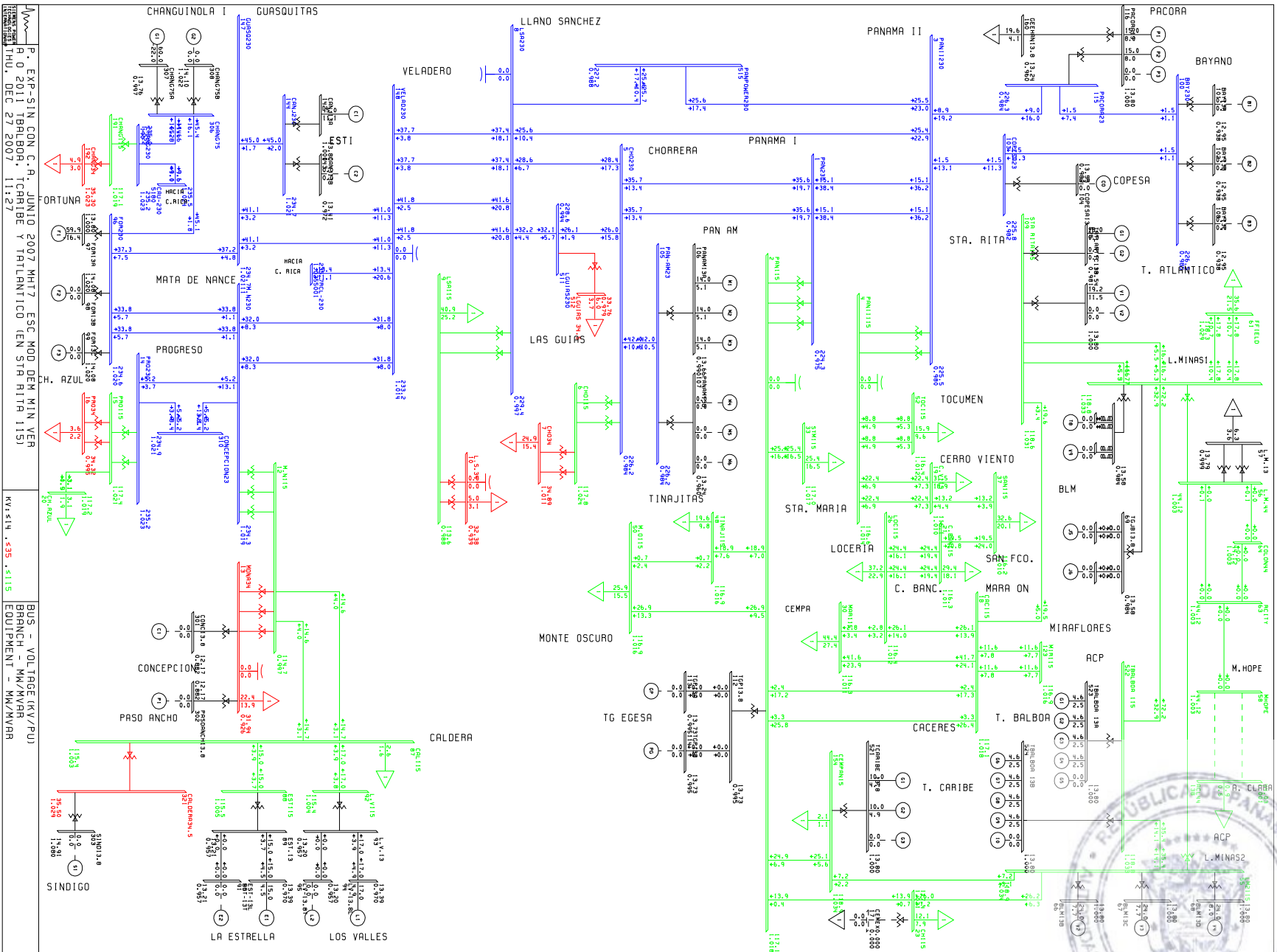
THU, DEC 27 2007 11:23

AREA 7 [ACANAL ] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
135		MAD6B		6.9000	G2	10.0	1.2	6.0	-6.0	1.0000	10.1	0.9923	13.0			2	7	
136		MAD6C		6.9000	G3	10.0	1.2	6.0	-6.0	1.0000	10.1	0.9923	13.0			2	7	
140		GAT6A		6.9000	G1	2.0	-0.1	2.0	-2.0	1.0000	2.0	0.9993	4.1			2	7	
140		GAT6A		6.9000	G2	2.0	-0.1	2.0	-2.0	1.0000	2.0	0.9993	4.1			2	7	
140		GAT6A		6.9000	G3	2.0	-0.1	2.0	-2.0	1.0000	2.0	0.9993	4.1			2	7	
141		GAT6B		6.9000	G4	4.0	-0.8	3.0	-3.0	1.0000	4.1	0.9802	5.6			2	7	
141		GAT6B		6.9000	G5	4.0	-0.8	3.0	-3.0	1.0000	4.1	0.9802	6.2			2	7	
141		GAT6B		6.9000	G6	4.0	-0.8	3.0	-3.0	1.0000	4.1	0.9802	6.2			2	7	
SUBSYSTEM TOTALS						38.0	-0.2	27.0	-27.0				56.4					



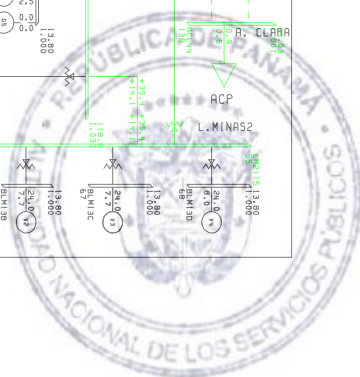
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EXP-SIN CON C.A. JUNIO 2007 MIT7 ESC MOD DEM MIN VER  
 P. O. 2011 TBAUBOR. TICARIBE Y TITLANTICO IEN STA RITA 1151  
 THU, DEC 27 2007 11:27

BUS - VOLTAGE (KV/RU)  
 BRNCH - MW/VVAR  
 EQUIPMENT - MW/VVAR

KV:414 .435 .4115



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**PLAN DE EXPANSIÓN DEL SIN 2008**  
**AÑO 2011 ESCENARIO MODERADO DE DEMANDA MÁXIMA INVIERNO**  
**Contingencia Llano Sánchez-Panamá II**



*de*

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
P. EXP-SIN CON C.A. JUNIO 2007 ESC MOD DEM MAX INV  
AÑO 2011 ESTUDIOS BÁSICOS-CONTINGENCIA LLS-PMA2

THU, DEC 27 2007 11:29

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
8		LSA230		230.00	6	1.0152	233.49	11		M.N230		230.00	6	1.0312	237.17
14		PRO230		230.00	6	1.0334	237.68	96		FOR230		230.00	6	1.0246	235.65
100		BAY230		230.00	6	1.0024	230.55	144		CANJ230		230.00	6	1.0287	236.61
147		GUASQ230		230.00	6	1.0286	236.58	148		VELAD230		230.00	6	1.0322	237.40
190		CHANG230		230.00	6	1.0245	235.63	306		CHANG75		230.00	6	1.0240	235.52
310		CONCEPCION23		230.00	6	1.0329	237.57	511		LGUIAS230		230.00	6	1.0022	230.51
6000		FRONTER		230.00	6	1.0338	237.77								

BUSES WITH VOLTAGE LESS THAN 1.0200:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
1		PAN230		230.00	6	0.9684	222.73	3		PANII230		230.00	6	0.9754	224.35
5		CHO230		230.00	6	0.9821	225.89	8		LSA230		230.00	6	1.0152	233.49
100		BAY230		230.00	6	1.0024	230.55	103		COPESA23		230.00	6	0.9799	225.39
105		PAN-AM23		230.00	6	0.9822	225.91	115		PACORA23		230.00	6	0.9832	226.13
511		LGUIAS230		230.00	6	1.0022	230.51	515		PANPOWER230		230.00	6	0.9863	226.85

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
P. EXP-SIN CON C.A. JUNIO 2007 ESC MOD DEM MAX INV  
AÑO 2011 ESTUDIOS BÁSICOS-CONTINGENCIA LLS-PMA2

THU, DEC 27 2007 11:29

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2		PAN115		115.00	6	1.0081	115.93	4		PANII115		115.00	6	1.0074	115.85
6		CHO115		115.00	6	1.0192	117.21	9		LSA115		115.00	6	1.0170	116.96
12		M.N115		115.00	6	1.0280	118.22	15		PRO115		115.00	6	1.0315	118.62
18		CAC115		115.00	6	1.0076	115.87	20		CH.AZUL		115.00	6	1.0285	118.28
23		CH115		115.00	6	1.0130	116.49	33		STM115		115.00	6	1.0064	115.74
48		TINAJ115		115.00	6	1.0047	115.54	50		M.O115		115.00	6	1.0048	115.56
52		TOC115		115.00	6	1.0046	115.53	54		LM115		115.00	6	1.0371	119.27
55		LM2115		115.00	6	1.0376	119.33	61		FFIELD		115.00	9	1.0309	118.55
87		CAL115		115.00	6	1.0420	119.83	88		EST115		115.00	6	1.0452	120.19
92		L.V115		115.00	6	1.0432	119.97	109		STA RITA115		115.00	6	1.0329	118.78
123		MIR115		115.00	7	1.0070	115.81	154		CEMPAN15		115.00	6	1.0342	118.94
191		CHANG115		115.00	6	1.0198	117.28	522		TBALBOA		115.00	6	1.0376	119.32

BUSES WITH VOLTAGE LESS THAN 1.0200:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2		PAN115		115.00	6	1.0081	115.93	4		PANII115		115.00	6	1.0074	115.85
6		CHO115		115.00	6	1.0192	117.21	9		LSA115		115.00	6	1.0170	116.96
18		CAC115		115.00	6	1.0076	115.87	19		C.V115		115.00	6	0.9991	114.90
21		C.BAN115		115.00	6	0.9978	114.75	23		CH115		115.00	6	1.0130	116.49
26		LOC115		115.00	6	0.9989	114.88	30		MAR115		115.00	6	0.9975	114.71
33		STM115		115.00	6	1.0064	115.74	37		SAN115		115.00	6	0.9967	114.62
48		TINAJ115		115.00	6	1.0047	115.54	50		M.O115		115.00	6	1.0048	115.56
52		TOC115		115.00	6	1.0046	115.53	123		MIR115		115.00	7	1.0070	115.81
191		CHANG115		115.00	6	1.0198	117.28								



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PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
 P. EXP-SIN CON C.A. JUNIO 2007 ESC MOD DEM MAX INV  
 AÑO 2011 ESTUDIOS BÁSICOS-CONTINGENCIA LLS-PMA2

THU, DEC 27 2007 11:29

AREA 6 [PANAMA] MACHINE SUMMARY:

BUS#	X-- NAME	--X BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
66	BLM13B	13.800	V2	38.0	11.5	17.0	0.0	1.0100	39.3	0.9571	47.0			1	6	
67	BLM13C	13.800	V3	38.0	11.5	17.0	0.0	1.0100	39.3	0.9571	47.0			1	6	
68	BLM13D	13.800	V4	38.0	11.9	30.0	0.0	1.0100	39.4	0.9541	47.0			1	6	
70	TGJB13A	13.800	J5	31.0	7.8	20.0	0.0	1.0100	31.7	0.9697	39.4			1	6	
71	TGJB13B	13.800	J6	31.0	7.8	20.0	0.0	1.0100	31.7	0.9697	39.4			1	6	
72	BLMCCA	13.800	T8	31.0	8.7	20.0	0.0	1.0100	31.9	0.9625	50.0			1	6	
73	BLMCCB	13.800	V9	47.0	9.1	40.0	0.0	1.0100	47.4	0.9819	71.0			1	6	
90	EST-13L	13.800	E1	22.0	5.3	12.0	-5.0	1.0100	22.4	0.9723	27.0			1	6	
91	EST-13T	13.800	E2	22.0	5.3	12.0	-5.0	1.0100	22.4	0.9723	27.0			1	6	
94	LV-13.8L	13.800	L1	24.0	6.0	12.0	-5.0	1.0100	24.5	0.9700	27.0			1	6	
95	LV-13.8T	13.800	L2	24.0	6.0	12.0	-5.0	1.0100	24.5	0.9700	27.0			1	6	
97	FOR13A	13.800	F1	84.0	-43.4	50.0	-50.0	0.9710	97.4	0.8885	111.0			1	6	
98	FOR13B	13.800	F2	84.0	-43.4	50.0	-50.0	0.9710	97.4	0.8885	111.0			1	6	
101	BAY13A	13.800	B1	41.4	20.6	50.0	-25.0	0.9800	47.2	0.8954	96.0			1	6	SYST
102	BAY13B	13.800	B2	41.4	20.6	50.0	-25.0	0.9800	47.2	0.8953	96.0			1	6	
106	PANAM13A	13.800	M1	14.0	5.3	9.0	0.0	0.9900	15.1	0.9360	20.7			1	6	
106	PANAM13A	13.800	M2	14.0	5.3	9.0	0.0	0.9900	15.1	0.9360	20.7			1	6	
106	PANAM13A	13.800	M3	14.0	5.3	9.0	0.0	0.9900	15.1	0.9360	20.7			1	6	
107	PANAM13B	13.800	M4	14.0	5.3	9.0	0.0	0.9900	15.1	0.9360	20.7			1	6	
107	PANAM13B	13.800	M5	14.0	5.3	9.0	0.0	0.9900	15.1	0.9360	20.7			1	6	
107	PANAM13B	13.800	M6	14.0	5.3	9.0	0.0	0.9900	15.1	0.9360	20.7			1	6	
108	BAY13C	13.800	B3	41.4	20.6	50.0	-25.0	0.9800	47.2	0.8953	100.0			1	6	
116	PACORA13	13.800	P1	15.0	8.8	8.8	0.0	0.9784	17.8	0.8618	21.7			1	6	
116	PACORA13	13.800	P2	15.0	8.8	8.8	0.0	0.9784	17.8	0.8618	21.7			1	6	
116	PACORA13	13.800	P3	15.0	8.8	8.8	0.0	0.9784	17.8	0.8618	21.7			1	6	
142	CANJ13A	13.800	C1	40.0	8.4	29.0	-29.0	1.0000	40.9	0.9787	69.0			1	6	
143	CANJ13B	13.800	C2	40.0	8.4	29.0	-29.0	1.0000	40.9	0.9787	69.0			1	6	
303	SIND13.8	13.800	S1	9.0	0.0	50.0	0.0	1.1214	8.0	1.0000	13.5			1	6	
307	CHANG75A	13.800	G1	65.0	-22.0	22.0	-22.0	0.9989	68.7	0.9472	118.6			1	6	
521	TCARIBE	13.813.800	G1	15.6	3.7	12.5	0.0	1.0000	16.0	0.9729	20.9			1	6	
521	TCARIBE	13.813.800	G2	15.6	3.7	12.5	0.0	1.0000	16.0	0.9729	20.9			1	6	
521	TCARIBE	13.813.800	G3	15.6	3.7	12.5	0.0	1.0000	16.0	0.9729	20.9			1	6	
523	TBALBOA	13A 13.800	G1	8.1	1.7	6.6	-6.6	1.0000	8.3	0.9777	10.9			1	6	
523	TBALBOA	13A 13.800	G2	8.1	1.7	6.6	-6.6	1.0000	8.3	0.9777	10.9			1	6	
523	TBALBOA	13A 13.800	G3	8.1	1.7	6.6	-6.6	1.0000	8.3	0.9777	10.9			1	6	
523	TBALBOA	13A 13.800	G4	8.1	1.7	6.6	-6.6	1.0000	8.3	0.9777	10.9			1	6	
523	TBALBOA	13A 13.800	G5	8.1	1.7	6.6	-6.6	1.0000	8.3	0.9777	10.9			1	6	
524	TBALBOA	13B 13.800	10	8.1	1.7	6.6	-6.6	1.0000	8.3	0.9777	10.9			1	6	
524	TBALBOA	13B 13.800	G6	8.1	1.7	6.6	-6.6	1.0000	8.3	0.9777	10.9			1	6	
524	TBALBOA	13B 13.800	G7	8.1	1.7	6.6	-6.6	1.0000	8.3	0.9777	10.9			1	6	
524	TBALBOA	13B 13.800	G8	8.1	1.7	6.6	-6.6	1.0000	8.3	0.9777	10.9			1	6	
524	TBALBOA	13B 13.800	G9	8.1	1.7	6.6	-6.6	1.0000	8.3	0.9777	10.9			1	6	
525	TATLANTIC13A13.800	G1	36.0	7.2	28.5	0.0	1.0000	36.7	0.9806	47.5			1	6		
525	TATLANTIC13A13.800	G2	36.0	7.2	28.5	0.0	1.0000	36.7	0.9806	47.5			1	6		
526	TATLANTIC13B13.800	V1	18.3	5.6	15.0	0.0	1.0000	19.1	0.9559	25.0			1	6		
526	TATLANTIC13B13.800	V2	18.3	5.6	15.0	0.0	1.0000	19.1	0.9559	25.0			1	6		
SUBSYSTEM TOTALS				1157.7	173.1	862.6	-340.6				1739.1					

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
 P. EXP-SIN CON C.A. JUNIO 2007 MHT7 ESC MOD DEM MAX INV  
 AÑO 2011 ESTUDIOS BÁSICOS-CONTINGENCIA LLS-PMA2

THU, DEC 27 2007 11:29

AREA 7 [ACANAL] MACHINE SUMMARY:



*Handwritten signature or initials.*

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
126	MIR13A	12.000	G1	8.5	0.0	5.0	0.0	1.0472	8.1	1.0000	13.5					2	7	
127	MIR13B	12.000	G2	8.5	0.0	5.0	0.0	1.0472	8.1	1.0000	13.5					2	7	
130	MIR13F	13.800	G5	10.6	4.5	8.0	0.0	1.0000	11.5	0.9195	27.7					2	7	
134	MAD6A	6.9000	G1	9.6	1.0	6.0	-6.0	1.0000	9.7	0.9945	13.0					2	7	
135	MAD6B	6.9000	G2	9.6	1.0	6.0	-6.0	1.0000	9.7	0.9946	13.0					2	7	
136	MAD6C	6.9000	G3	9.6	1.0	6.0	-6.0	1.0000	9.7	0.9946	13.0					2	7	
140	GAT6A	6.9000	G1	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9995	4.1					2	7	
140	GAT6A	6.9000	G2	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9995	4.1					2	7	
140	GAT6A	6.9000	G3	1.9	0.1	2.0	-2.0	1.0000	1.9	0.9995	4.1					2	7	
141	GAT6B	6.9000	G4	3.8	-0.7	3.0	-3.0	1.0000	3.9	0.9843	5.6					2	7	
141	GAT6B	6.9000	G5	3.8	-0.7	3.0	-3.0	1.0000	3.9	0.9843	6.2					2	7	
141	GAT6B	6.9000	G6	3.8	-0.7	3.0	-3.0	1.0000	3.9	0.9843	6.2					2	7	
SUBSYSTEM TOTALS						73.5	5.7	51.0	-33.0			124.2						

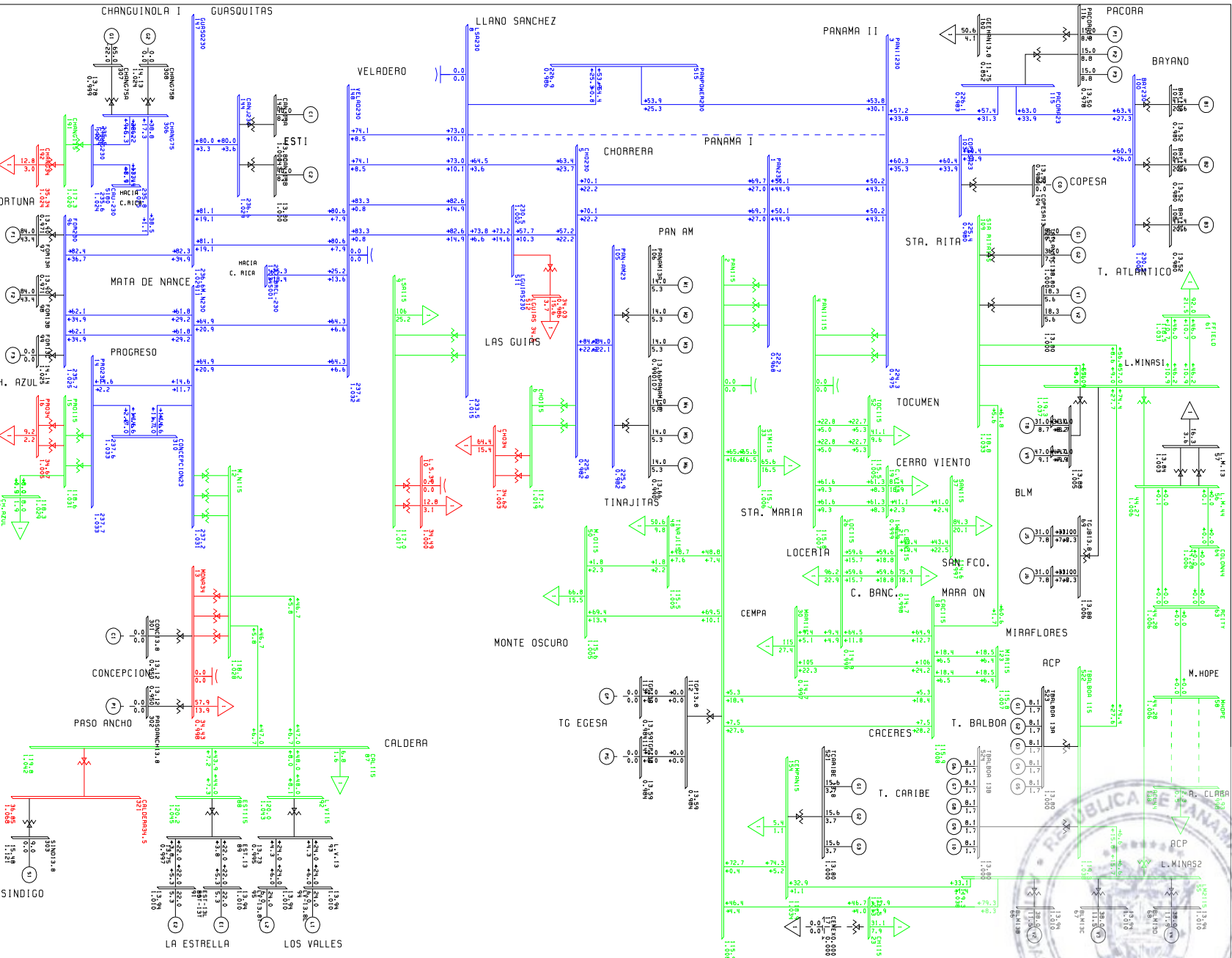


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W P. EXP-SIN CON C. R. JUNIO 2007 MH7 ESC MOD DEM MKX INV  
 R. O. 2011 ESTUDIOS B. SIGOS-CONTINGENCIA ILS-PM2  
 THU, DEC 27 2007 11:31

KV-S14 .5S3 .5115

BUS - VOLTRGE (KV/PU)  
 BRANCH - MW/MVAR  
 EQUIPMENT - MW/MVAR



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**PLAN DE EXPANSIÓN DEL SIN 2008**  
**AÑO 2011 ESCENARIO MODERADO DE DEMANDA MÁXIMA INVIERNO**  
**Contingencia Guasquitas-Veladero**



*de*

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
8		LSA230		230.00	6	1.0156	233.60	11		M.N230		230.00	6	1.0282	236.48
14		PRO230		230.00	6	1.0307	237.05	96		FOR230		230.00	6	1.0216	234.97
100		BAY230		230.00	6	1.0074	231.71	144		CANJ230		230.00	6	1.0244	235.61
147		GUASQ230		230.00	6	1.0242	235.57	148		VELAD230		230.00	6	1.0294	236.76
190		CHANG230		230.00	6	1.0225	235.19	306		CHANG75		230.00	6	1.0219	235.03
310		CONCEPCION230		230.00	6	1.0300	236.90	511		LGUIAS230		230.00	6	1.0051	231.17
6000		FRONTER		230.00	6	1.0312	237.17								

BUSES WITH VOLTAGE LESS THAN 1.0200:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
1		PAN230		230.00	6	0.9756	224.38	3		PANII230		230.00	6	0.9837	226.25
5		CHO230		230.00	6	0.9876	227.15	8		LSA230		230.00	6	1.0156	233.60
100		BAY230		230.00	6	1.0074	231.71	103		COPESA23		230.00	6	0.9877	227.18
105		PAN-AM23		230.00	6	0.9877	227.17	115		PACORA23		230.00	6	0.9907	227.85
511		LGUIAS230		230.00	6	1.0051	231.17	515		PANPOWER230		230.00	6	0.9936	228.52

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2		PAN115		115.00	6	1.0146	116.68	4		PANII115		115.00	6	1.0146	116.68
6		CHO115		115.00	6	1.0251	117.89	9		LSA115		115.00	6	1.0175	117.02
12		M.N115		115.00	6	1.0257	117.96	15		PRO115		115.00	6	1.0287	118.30
18		CAC115		115.00	6	1.0140	116.62	19		C.V115		115.00	6	1.0062	115.72
20		CH.AZUL		115.00	6	1.0258	117.96	21		C.BAN115		115.00	6	1.0045	115.51
23		CH115		115.00	6	1.0178	117.05	26		LOC115		115.00	6	1.0055	115.64
30		MAR115		115.00	6	1.0040	115.46	33		STM115		115.00	6	1.0129	116.49
37		SAN115		115.00	6	1.0034	115.39	48		TINAJ115		115.00	6	1.0112	116.29
50		M.O115		115.00	6	1.0113	116.30	52		TOC115		115.00	6	1.0119	116.37
54		LM1115		115.00	6	1.0396	119.56	55		LM2115		115.00	6	1.0401	119.62
61		FFIELD		115.00	9	1.0334	118.84	87		CAL115		115.00	6	1.0405	119.65
88		EST115		115.00	6	1.0438	120.04	92		L.V115		115.00	6	1.0417	119.80
109		STA RITA115		115.00	6	1.0360	119.14	123		MIR115		115.00	7	1.0131	116.51
154		CEMPAN15		115.00	6	1.0372	119.28	191		CHANG115		115.00	6	1.0178	117.05
522		TBALBOA	115	115.00	6	1.0401	119.61								

BUSES WITH VOLTAGE LESS THAN 1.0200:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2		PAN115		115.00	6	1.0146	116.68	4		PANII115		115.00	6	1.0146	116.68
9		LSA115		115.00	6	1.0175	117.02	18		CAC115		115.00	6	1.0140	116.62
19		C.V115		115.00	6	1.0062	115.72	21		C.BAN115		115.00	6	1.0045	115.51
23		CH115		115.00	6	1.0178	117.05	26		LOC115		115.00	6	1.0055	115.64
30		MAR115		115.00	6	1.0040	115.46	33		STM115		115.00	6	1.0129	116.49
37		SAN115		115.00	6	1.0034	115.39	48		TINAJ115		115.00	6	1.0112	116.29
50		M.O115		115.00	6	1.0113	116.30	52		TOC115		115.00	6	1.0119	116.37
123		MIR115		115.00	7	1.0131	116.51	191		CHANG115		115.00	6	1.0178	117.05



PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
 P. EXP-SIN CON C.A. JUNIO 2007 ESC MOD DEM MAX INV  
 AÑO 2011 ESTUDIOS BÁSICOS-CONTINGENCIA GUASQ-VEL  
 AREA 6 [PANAMA ] MACHINE SUMMARY:

THU, DEC 27 2007 11:37

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
66		BLM13B		13.800	V2	38.0	10.4	17.0	0.0	1.0100	39.0	0.9645	47.0			1	6	
67		BLM13C		13.800	V3	38.0	10.4	17.0	0.0	1.0100	39.0	0.9645	47.0			1	6	
68		BLM13D		13.800	V4	38.0	10.8	30.0	0.0	1.0100	39.1	0.9620	47.0			1	6	
70		TGJB13A		13.800	J5	31.0	7.2	20.0	0.0	1.0100	31.5	0.9743	39.4			1	6	
71		TGJB13B		13.800	J6	31.0	7.2	20.0	0.0	1.0100	31.5	0.9743	39.4			1	6	
72		BLMCCA		13.800	T8	31.0	8.1	20.0	0.0	1.0100	31.7	0.9676	50.0			1	6	
73		BLMCCB		13.800	V9	47.0	8.4	40.0	0.0	1.0100	47.3	0.9843	71.0			1	6	
90		EST-13L		13.800	E1	22.0	5.7	12.0	-5.0	1.0100	22.5	0.9681	27.0			1	6	
91		EST-13T		13.800	E2	22.0	5.7	12.0	-5.0	1.0100	22.5	0.9681	27.0			1	6	
94		LV-13.8L		13.800	L1	24.0	6.4	12.0	-5.0	1.0100	24.6	0.9657	27.0			1	6	
95		LV-13.8T		13.800	L2	24.0	6.4	12.0	-5.0	1.0100	24.6	0.9657	27.0			1	6	
97		FOR13A		13.800	F1	84.0	-40.8	50.0	-50.0	0.9710	96.2	0.8997	111.0			1	6	
98		FOR13B		13.800	F2	84.0	-40.8	50.0	-50.0	0.9710	96.2	0.8997	111.0			1	6	
101		BAY13A		13.800	B1	41.5	16.9	50.0	-25.0	0.9800	45.8	0.9261	96.0			1	6	SYST
102		BAY13B		13.800	B2	41.5	16.9	50.0	-25.0	0.9800	45.8	0.9261	96.0			1	6	
106		PANAM13A		13.800	M1	14.0	4.5	9.0	0.0	0.9900	14.9	0.9521	20.7			1	6	
106		PANAM13A		13.800	M2	14.0	4.5	9.0	0.0	0.9900	14.9	0.9521	20.7			1	6	
106		PANAM13A		13.800	M3	14.0	4.5	9.0	0.0	0.9900	14.9	0.9521	20.7			1	6	
107		PANAM13B		13.800	M4	14.0	4.5	9.0	0.0	0.9900	14.9	0.9521	20.7			1	6	
107		PANAM13B		13.800	M5	14.0	4.5	9.0	0.0	0.9900	14.9	0.9521	20.7			1	6	
107		PANAM13B		13.800	M6	14.0	4.5	9.0	0.0	0.9900	14.9	0.9521	20.7			1	6	
108		BAY13C		13.800	B3	41.5	16.9	50.0	-25.0	0.9800	45.8	0.9261	100.0			1	6	
116		PACORA13		13.800	P1	15.0	8.8	8.8	0.0	0.9873	17.6	0.8618	21.7			1	6	
116		PACORA13		13.800	P2	15.0	8.8	8.8	0.0	0.9873	17.6	0.8618	21.7			1	6	
116		PACORA13		13.800	P3	15.0	8.8	8.8	0.0	0.9873	17.6	0.8618	21.7			1	6	
142		CANJ13A		13.800	C1	40.0	9.1	29.0	-29.0	1.0000	41.0	0.9752	69.0			1	6	
143		CANJ13B		13.800	C2	40.0	9.1	29.0	-29.0	1.0000	41.0	0.9752	69.0			1	6	
303		SIND13.8		13.800	S1	9.0	0.0	50.0	0.0	1.1198	8.0	1.0000	13.5			1	6	
307		CHANG75A		13.800	G1	65.0	-22.0	22.0	-22.0	0.9967	68.8	0.9472	118.6			1	6	
521		TCARIBE	13.813	13.800	G1	15.6	3.1	12.5	0.0	1.0000	15.9	0.9806	20.9			1	6	
521		TCARIBE	13.813	13.800	G2	15.6	3.1	12.5	0.0	1.0000	15.9	0.9806	20.9			1	6	
521		TCARIBE	13.813	13.800	G3	15.6	3.1	12.5	0.0	1.0000	15.9	0.9806	20.9			1	6	
523		TBALBOA	13A	13.800	G1	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9846	10.9			1	6	
523		TBALBOA	13A	13.800	G2	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9846	10.9			1	6	
523		TBALBOA	13A	13.800	G3	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9846	10.9			1	6	
523		TBALBOA	13A	13.800	G4	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9846	10.9			1	6	
523		TBALBOA	13A	13.800	G5	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9846	10.9			1	6	
524		TBALBOA	13B	13.800	10	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9846	10.9			1	6	
524		TBALBOA	13B	13.800	G6	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9846	10.9			1	6	
524		TBALBOA	13B	13.800	G7	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9846	10.9			1	6	
524		TBALBOA	13B	13.800	G8	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9846	10.9			1	6	
524		TBALBOA	13B	13.800	G9	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9846	10.9			1	6	
525		TATLANTIC13A13		13.800	G1	36.0	6.3	28.5	0.0	1.0000	36.5	0.9851	47.5			1	6	
525		TATLANTIC13A13		13.800	G2	36.0	6.3	28.5	0.0	1.0000	36.5	0.9851	47.5			1	6	
526		TATLANTIC13B13		13.800	V1	18.3	4.7	15.0	0.0	1.0000	18.9	0.9685	25.0			1	6	
526		TATLANTIC13B13		13.800	V2	18.3	4.7	15.0	0.0	1.0000	18.9	0.9685	25.0			1	6	
SUBSYSTEM TOTALS						1158.0	151.3	862.6	-340.6				1739.1					

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
 P. EXP-SIN CON C.A. JUNIO 2007 ESC MOD DEM MAX INV  
 AÑO 2011 ESTUDIOS BÁSICOS-CONTINGENCIA GUASQ-VEL

THU, DEC 27 2007 11:37

AREA 7 [ACANAL ] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
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126	MIR13A	12.000	G1	8.5	0.0	5.0	0.0	1.0504	8.1	1.0000	13.5	2	7
127	MIR13B	12.000	G2	8.5	0.0	5.0	0.0	1.0504	8.1	1.0000	13.5	2	7
130	MIR13F	13.800	G5	10.6	3.1	8.0	0.0	1.0000	11.1	0.9589	27.7	2	7
134	MAD6A	6.9000	G1	9.6	0.8	6.0	-6.0	1.0000	9.6	0.9962	13.0	2	7
135	MAD6B	6.9000	G2	9.6	0.8	6.0	-6.0	1.0000	9.6	0.9963	13.0	2	7
136	MAD6C	6.9000	G3	9.6	0.8	6.0	-6.0	1.0000	9.6	0.9963	13.0	2	7
140	GAT6A	6.9000	G1	1.9	0.0	2.0	-2.0	1.0000	1.9	1.0000	4.1	2	7
140	GAT6A	6.9000	G2	1.9	0.0	2.0	-2.0	1.0000	1.9	1.0000	4.1	2	7
140	GAT6A	6.9000	G3	1.9	0.0	2.0	-2.0	1.0000	1.9	1.0000	4.1	2	7
141	GAT6B	6.9000	G4	3.8	-0.7	3.0	-3.0	1.0000	3.9	0.9821	5.6	2	7
141	GAT6B	6.9000	G5	3.8	-0.7	3.0	-3.0	1.0000	3.9	0.9821	6.2	2	7
141	GAT6B	6.9000	G6	3.8	-0.7	3.0	-3.0	1.0000	3.9	0.9821	6.2	2	7
SUBSYSTEM TOTALS				73.5	3.5	51.0	-33.0				124.2		



*Handwritten signature or initials.*



**PLAN DE EXPANSIÓN DEL SIN 2008**  
**AÑO 2011 ESCENARIO MODERADO DE DEMANDA MÁXIMA INVIERNO**  
**Contingencia Mata de Nance-Veladero**



*de*

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
8		LSA230		230.00	6	1.0161	233.71	11		M.N230		230.00	6	1.0276	236.34
14		PRO230		230.00	6	1.0302	236.95	96		FOR230		230.00	6	1.0217	234.99
100		BAY230		230.00	6	1.0075	231.73	144		CANJ230		230.00	6	1.0259	235.96
147		GUASQ230		230.00	6	1.0258	235.93	148		VELAD230		230.00	6	1.0301	236.93
190		CHANG230		230.00	6	1.0227	235.21	306		CHANG75		230.00	6	1.0220	235.05
310		CONCEPCION230		230.00	6	1.0295	236.79	511		LGUIAS230		230.00	6	1.0055	231.26
6000		FRONTER		230.00	6	1.0308	237.08								

BUSES WITH VOLTAGE LESS THAN 1.0200:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
1		PAN230		230.00	6	0.9758	224.42	3		PANII230		230.00	6	0.9839	226.30
5		CHO230		230.00	6	0.9878	227.20	8		LSA230		230.00	6	1.0161	233.71
100		BAY230		230.00	6	1.0075	231.73	103		COPESA23		230.00	6	0.9879	227.22
105		PAN-AM23		230.00	6	0.9879	227.23	115		PACORA23		230.00	6	0.9908	227.89
511		LGUIAS230		230.00	6	1.0055	231.26	515		PANPOWER230		230.00	6	0.9938	228.57

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2		PAN115		115.00	6	1.0148	116.70	4		PANII115		115.00	6	1.0148	116.70
6		CHO115		115.00	6	1.0254	117.92	9		LSA115		115.00	6	1.0181	117.08
12		M.N115		115.00	6	1.0253	117.91	15		PRO115		115.00	6	1.0283	118.25
18		CAC115		115.00	6	1.0142	116.64	19		C.V115		115.00	6	1.0064	115.74
20		CH.AZUL		115.00	6	1.0253	117.91	21		C.BAN115		115.00	6	1.0046	115.53
23		CH115		115.00	6	1.0180	117.07	26		LOC115		115.00	6	1.0057	115.66
30		MAR115		115.00	6	1.0042	115.48	33		STM115		115.00	6	1.0131	116.51
37		SAN115		115.00	6	1.0036	115.41	48		TINAJ115		115.00	6	1.0114	116.31
50		M.O115		115.00	6	1.0115	116.33	52		TOC115		115.00	6	1.0121	116.39
54		LM115		115.00	6	1.0397	119.56	55		LM2115		115.00	6	1.0402	119.62
61		FFIELD		115.00	9	1.0335	118.85	87		CAL115		115.00	6	1.0402	119.62
88		EST115		115.00	6	1.0435	120.01	92		L.V115		115.00	6	1.0415	119.77
109		STA RITA115		115.00	6	1.0360	119.15	123		MIR115		115.00	7	1.0133	116.53
154		CEMPAN15		115.00	6	1.0373	119.29	191		CHANG115		115.00	6	1.0180	117.07
522		TBALBOA 115		115.00	6	1.0402	119.62								

BUSES WITH VOLTAGE LESS THAN 1.0200:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2		PAN115		115.00	6	1.0148	116.70	4		PANII115		115.00	6	1.0148	116.70
9		LSA115		115.00	6	1.0181	117.08	18		CAC115		115.00	6	1.0142	116.64
19		C.V115		115.00	6	1.0064	115.74	21		C.BAN115		115.00	6	1.0046	115.53
23		CH115		115.00	6	1.0180	117.07	26		LOC115		115.00	6	1.0057	115.66
30		MAR115		115.00	6	1.0042	115.48	33		STM115		115.00	6	1.0131	116.51
37		SAN115		115.00	6	1.0036	115.41	48		TINAJ115		115.00	6	1.0114	116.31
50		M.O115		115.00	6	1.0115	116.33	52		TOC115		115.00	6	1.0121	116.39
123		MIR115		115.00	7	1.0133	116.53	191		CHANG115		115.00	6	1.0180	117.07



PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
 P. EXP-SIN CON C.A. JUNIO 2007 ESC MOD DEM MAX INV  
 AÑO 2011 ESTUDIOS BÁSICOS-CONTINGENCIA MDN-VEL  
 AREA 6 [PANAMA ] MACHINE SUMMARY:

THU, DEC 27 2007 11:33

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
66		BLM13B		13.800	V2	38.0	10.4	17.0	0.0	1.0100	39.0	0.9646	47.0			1	6	
67		BLM13C		13.800	V3	38.0	10.4	17.0	0.0	1.0100	39.0	0.9646	47.0			1	6	
68		BLM13D		13.800	V4	38.0	10.8	30.0	0.0	1.0100	39.1	0.9622	47.0			1	6	
70		TGJB13A		13.800	J5	31.0	7.1	20.0	0.0	1.0100	31.5	0.9745	39.4			1	6	
71		TGJB13B		13.800	J6	31.0	7.1	20.0	0.0	1.0100	31.5	0.9745	39.4			1	6	
72		BLMCCA		13.800	T8	31.0	8.1	20.0	0.0	1.0100	31.7	0.9677	50.0			1	6	
73		BLMCCB		13.800	V9	47.0	8.4	40.0	0.0	1.0100	47.3	0.9844	71.0			1	6	
90		EST-13L		13.800	E1	22.0	5.8	12.0	-5.0	1.0100	22.5	0.9673	27.0			1	6	
91		EST-13T		13.800	E2	22.0	5.8	12.0	-5.0	1.0100	22.5	0.9673	27.0			1	6	
94		LV-13.8L		13.800	L1	24.0	6.5	12.0	-5.0	1.0100	24.6	0.9649	27.0			1	6	
95		LV-13.8T		13.800	L2	24.0	6.5	12.0	-5.0	1.0100	24.6	0.9649	27.0			1	6	
97		FOR13A		13.800	F1	84.0	-40.8	50.0	-50.0	0.9710	96.2	0.8994	111.0			1	6	
98		FOR13B		13.800	F2	84.0	-40.8	50.0	-50.0	0.9710	96.2	0.8994	111.0			1	6	
101		BAY13A		13.800	B1	42.4	16.9	50.0	-25.0	0.9800	46.6	0.9290	96.0			1	6	SYST
102		BAY13B		13.800	B2	40.6	16.8	50.0	-25.0	0.9800	44.9	0.9241	96.0			1	6	
106		PANAM13A		13.800	M1	14.0	4.5	9.0	0.0	0.9900	14.8	0.9528	20.7			1	6	
106		PANAM13A		13.800	M2	14.0	4.5	9.0	0.0	0.9900	14.8	0.9528	20.7			1	6	
106		PANAM13A		13.800	M3	14.0	4.5	9.0	0.0	0.9900	14.8	0.9528	20.7			1	6	
107		PANAM13B		13.800	M4	14.0	4.5	9.0	0.0	0.9900	14.8	0.9528	20.7			1	6	
107		PANAM13B		13.800	M5	14.0	4.5	9.0	0.0	0.9900	14.8	0.9528	20.7			1	6	
107		PANAM13B		13.800	M6	14.0	4.5	9.0	0.0	0.9900	14.8	0.9528	20.7			1	6	
108		BAY13C		13.800	B3	40.6	16.8	50.0	-25.0	0.9800	44.9	0.9241	100.0			1	6	
116		PACORA13		13.800	P1	15.0	8.8	8.8	0.0	0.9875	17.6	0.8618	21.7			1	6	
116		PACORA13		13.800	P2	15.0	8.8	8.8	0.0	0.9875	17.6	0.8618	21.7			1	6	
116		PACORA13		13.800	P3	15.0	8.8	8.8	0.0	0.9875	17.6	0.8618	21.7			1	6	
142		CANJ13A		13.800	C1	40.0	8.8	29.0	-29.0	1.0000	41.0	0.9765	69.0			1	6	
143		CANJ13B		13.800	C2	40.0	8.8	29.0	-29.0	1.0000	41.0	0.9765	69.0			1	6	
303		SIND13.8		13.800	S1	9.0	0.0	50.0	0.0	1.1195	8.0	1.0000	13.5			1	6	
307		CHANG75A		13.800	G1	65.0	-22.0	22.0	-22.0	0.9968	68.8	0.9472	118.6			1	6	
521		TCARIBE	13.813	13.800	G1	15.6	3.1	12.5	0.0	1.0000	15.9	0.9808	20.9			1	6	
521		TCARIBE	13.813	13.800	G2	15.6	3.1	12.5	0.0	1.0000	15.9	0.9808	20.9			1	6	
521		TCARIBE	13.813	13.800	G3	15.6	3.1	12.5	0.0	1.0000	15.9	0.9808	20.9			1	6	
523		TBALBOA	13A	13.800	G1	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9847	10.9			1	6	
523		TBALBOA	13A	13.800	G2	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9847	10.9			1	6	
523		TBALBOA	13A	13.800	G3	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9847	10.9			1	6	
523		TBALBOA	13A	13.800	G4	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9847	10.9			1	6	
523		TBALBOA	13A	13.800	G5	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9847	10.9			1	6	
524		TBALBOA	13B	13.800	10	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9847	10.9			1	6	
524		TBALBOA	13B	13.800	G6	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9847	10.9			1	6	
524		TBALBOA	13B	13.800	G7	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9847	10.9			1	6	
524		TBALBOA	13B	13.800	G8	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9847	10.9			1	6	
524		TBALBOA	13B	13.800	G9	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9847	10.9			1	6	
525		TATLANTIC13A13		13.800	G1	36.0	6.3	28.5	0.0	1.0000	36.5	0.9853	47.5			1	6	
525		TATLANTIC13A13		13.800	G2	36.0	6.3	28.5	0.0	1.0000	36.5	0.9853	47.5			1	6	
526		TATLANTIC13B13		13.800	V1	18.3	4.7	15.0	0.0	1.0000	18.9	0.9688	25.0			1	6	
526		TATLANTIC13B13		13.800	V2	18.3	4.7	15.0	0.0	1.0000	18.9	0.9688	25.0			1	6	
SUBSYSTEM TOTALS						1157.1	150.1	862.6	-340.6				1739.1					

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
 P. EXP-SIN CON C.A. JUNIO 2007 MHT7 ESC MOD DEM MAX INV  
 AÑO 2011 ESTUDIOS BÁSICOS-CONTINGENCIA MDN-VEL

THU, DEC 27 2007 11:33



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AREA 7 [ACANAL ] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
126		MIR13A		12.000	G1	8.5	0.0	5.0	0.0	1.0505	8.1	1.0000	13.5			2	7	
127		MIR13B		12.000	G2	8.5	0.0	5.0	0.0	1.0505	8.1	1.0000	13.5			2	7	
130		MIR13F		13.800	G5	10.6	3.1	8.0	0.0	1.0000	11.0	0.9598	27.7			2	7	
134		MAD6A		6.9000	G1	9.6	0.8	6.0	-6.0	1.0000	9.6	0.9963	13.0			2	7	
135		MAD6B		6.9000	G2	9.6	0.8	6.0	-6.0	1.0000	9.6	0.9963	13.0			2	7	
136		MAD6C		6.9000	G3	9.6	0.8	6.0	-6.0	1.0000	9.6	0.9963	13.0			2	7	
140		GAT6A		6.9000	G1	1.9	0.0	2.0	-2.0	1.0000	1.9	1.0000	4.1			2	7	
140		GAT6A		6.9000	G2	1.9	0.0	2.0	-2.0	1.0000	1.9	1.0000	4.1			2	7	
140		GAT6A		6.9000	G3	1.9	0.0	2.0	-2.0	1.0000	1.9	1.0000	4.1			2	7	
141		GAT6B		6.9000	G4	3.8	-0.7	3.0	-3.0	1.0000	3.9	0.9820	5.6			2	7	
141		GAT6B		6.9000	G5	3.8	-0.7	3.0	-3.0	1.0000	3.9	0.9820	6.2			2	7	
141		GAT6B		6.9000	G6	3.8	-0.7	3.0	-3.0	1.0000	3.9	0.9820	6.2			2	7	
SUBSYSTEM TOTALS						73.5	3.4	51.0	-33.0				124.2					



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**PLAN DE EXPANSIÓN DEL SIN 2008**  
**AÑO 2011 ESCENARIO MODERADO DE DEMANDA MÁXIMA INVIERNO**  
**Contingencia Panamá-Cemento Panamá**



*de*

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
8		LSA230		230.00	6	1.0172	233.95	11		M.N230		230.00	6	1.0320	237.36
14		PRO230		230.00	6	1.0342	237.86	96		FOR230		230.00	6	1.0253	235.82
100		BAY230		230.00	6	1.0059	231.36	144		CANJ230		230.00	6	1.0296	236.80
147		GUASQ230		230.00	6	1.0295	236.78	148		VELAD230		230.00	6	1.0335	237.70
190		CHANG230		230.00	6	1.0250	235.74	306		CHANG75		230.00	6	1.0245	235.64
310		CONCEPCION230		230.00	6	1.0337	237.75	511		LGUIAS230		230.00	6	1.0052	231.20
6000		FRONTER		230.00	6	1.0346	237.95								

BUSES WITH VOLTAGE LESS THAN 1.0200:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
1		PAN230		230.00	6	0.9726	223.69	3		PANII230		230.00	6	0.9812	225.67
5		CHO230		230.00	6	0.9858	226.73	8		LSA230		230.00	6	1.0172	233.95
100		BAY230		230.00	6	1.0059	231.36	103		COPESA23		230.00	6	0.9854	226.63
105		PAN-AM23		230.00	6	0.9859	226.76	115		PACORA23		230.00	6	0.9884	227.33
511		LGUIAS230		230.00	6	1.0052	231.20	515		PANPOWER230		230.00	6	0.9917	228.10

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2		PAN115		115.00	6	1.0103	116.18	4		PANII115		115.00	6	1.0112	116.29
6		CHO115		115.00	6	1.0232	117.67	9		LSA115		115.00	6	1.0192	117.20
12		M.N115		115.00	6	1.0286	118.29	15		PRO115		115.00	6	1.0323	118.71
18		CAC115		115.00	6	1.0097	116.12	19		C.V115		115.00	6	1.0025	115.28
20		CH.AZUL		115.00	6	1.0293	118.37	21		C.BAN115		115.00	6	1.0002	115.02
23		CH115		115.00	6	1.0140	116.61	26		LOC115		115.00	6	1.0013	115.14
33		STM115		115.00	6	1.0086	115.99	48		TINAJ115		115.00	6	1.0069	115.79
50		M.O115		115.00	6	1.0070	115.80	52		TOC115		115.00	6	1.0085	115.97
54		LM1115		115.00	6	1.0385	119.43	55		LM2115		115.00	6	1.0395	119.55
61		FFIELD		115.00	9	1.0323	118.71	87		CAL115		115.00	6	1.0424	119.88
88		EST115		115.00	6	1.0455	120.24	92		L.V115		115.00	6	1.0436	120.02
109		STA RITA115		115.00	6	1.0338	118.88	123		MIR115		115.00	7	1.0090	116.04
154		CEMPAN15		115.00	6	1.0447	120.14	191		CHANG115		115.00	6	1.0203	117.33
522		TBALBOA 115		115.00	6	1.0392	119.51								

BUSES WITH VOLTAGE LESS THAN 1.0200:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2		PAN115		115.00	6	1.0103	116.18	4		PANII115		115.00	6	1.0112	116.29
9		LSA115		115.00	6	1.0192	117.20	18		CAC115		115.00	6	1.0097	116.12
19		C.V115		115.00	6	1.0025	115.28	21		C.BAN115		115.00	6	1.0002	115.02
23		CH115		115.00	6	1.0140	116.61	26		LOC115		115.00	6	1.0013	115.14
30		MAR115		115.00	6	0.9997	114.97	33		STM115		115.00	6	1.0086	115.99
37		SAN115		115.00	6	0.9991	114.90	48		TINAJ115		115.00	6	1.0069	115.79
50		M.O115		115.00	6	1.0070	115.80	52		TOC115		115.00	6	1.0085	115.97
123		MIR115		115.00	7	1.0090	116.04								



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PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
 P. EXP-SIN CON C.A. JUNIO 2007 ESC MOD DEM MAX INV  
 AÑO 2011 ESTUDIOS BÁSICOS-CONTINGENCIAS PMA-CEMPAN  
 AREA 6 [PANAMA ] MACHINE SUMMARY:

THU, DEC 27 2007 11:51

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
66		BLM13B		13.800	V2	38.0	10.7	17.0	0.0	1.0100	39.1	0.9628	47.0			1	6	
67		BLM13C		13.800	V3	38.0	10.7	17.0	0.0	1.0100	39.1	0.9628	47.0			1	6	
68		BLM13D		13.800	V4	38.0	11.1	30.0	0.0	1.0100	39.2	0.9601	47.0			1	6	
70		TGJB13A		13.800	J5	31.0	7.4	20.0	0.0	1.0100	31.6	0.9723	39.4			1	6	
71		TGJB13B		13.800	J6	31.0	7.4	20.0	0.0	1.0100	31.6	0.9723	39.4			1	6	
72		BLMCCA		13.800	T8	31.0	8.4	20.0	0.0	1.0100	31.8	0.9654	50.0			1	6	
73		BLMCCB		13.800	V9	47.0	8.7	40.0	0.0	1.0100	47.3	0.9833	71.0			1	6	
90		EST-13L		13.800	E1	22.0	5.2	12.0	-5.0	1.0100	22.4	0.9734	27.0			1	6	
91		EST-13T		13.800	E2	22.0	5.2	12.0	-5.0	1.0100	22.4	0.9734	27.0			1	6	
94		LV-13.8L		13.800	L1	24.0	5.9	12.0	-5.0	1.0100	24.5	0.9711	27.0			1	6	
95		LV-13.8T		13.800	L2	24.0	5.9	12.0	-5.0	1.0100	24.5	0.9711	27.0			1	6	
97		FOR13A		13.800	F1	84.0	-44.0	50.0	-50.0	0.9710	97.7	0.8857	111.0			1	6	
98		FOR13B		13.800	F2	84.0	-44.0	50.0	-50.0	0.9710	97.7	0.8857	111.0			1	6	
101		BAY13A		13.800	B1	41.8	18.0	50.0	-25.0	0.9800	46.4	0.9180	96.0			1	6	SYST
102		BAY13B		13.800	B2	41.8	18.0	50.0	-25.0	0.9800	46.4	0.9180	96.0			1	6	
106		PANAM13A		13.800	M1	14.0	4.7	9.0	0.0	0.9900	14.9	0.9470	20.7			1	6	
106		PANAM13A		13.800	M2	14.0	4.7	9.0	0.0	0.9900	14.9	0.9470	20.7			1	6	
106		PANAM13A		13.800	M3	14.0	4.7	9.0	0.0	0.9900	14.9	0.9470	20.7			1	6	
107		PANAM13B		13.800	M4	14.0	4.7	9.0	0.0	0.9900	14.9	0.9470	20.7			1	6	
107		PANAM13B		13.800	M5	14.0	4.7	9.0	0.0	0.9900	14.9	0.9470	20.7			1	6	
107		PANAM13B		13.800	M6	14.0	4.7	9.0	0.0	0.9900	14.9	0.9470	20.7			1	6	
108		BAY13C		13.800	B3	41.8	18.0	50.0	-25.0	0.9800	46.4	0.9180	100.0			1	6	
116		PACORA13		13.800	P1	15.0	8.8	8.8	0.0	0.9846	17.7	0.8618	21.7			1	6	
116		PACORA13		13.800	P2	15.0	8.8	8.8	0.0	0.9846	17.7	0.8618	21.7			1	6	
116		PACORA13		13.800	P3	15.0	8.8	8.8	0.0	0.9846	17.7	0.8618	21.7			1	6	
142		CANJ13A		13.800	C1	40.0	8.2	29.0	-29.0	1.0000	40.8	0.9794	69.0			1	6	
143		CANJ13B		13.800	C2	40.0	8.2	29.0	-29.0	1.0000	40.8	0.9794	69.0			1	6	
303		SIND13.8		13.800	S1	9.0	0.0	50.0	0.0	1.1219	8.0	1.0000	13.5			1	6	
307		CHANG75A		13.800	G1	65.0	-22.0	22.0	-22.0	0.9994	68.7	0.9472	118.6			1	6	
521		TCARIBE	13.813	13.800	G1	15.6	1.6	12.5	0.0	1.0000	15.7	0.9946	20.9			1	6	
521		TCARIBE	13.813	13.800	G2	15.6	1.6	12.5	0.0	1.0000	15.7	0.9946	20.9			1	6	
521		TCARIBE	13.813	13.800	G3	15.6	1.6	12.5	0.0	1.0000	15.7	0.9946	20.9			1	6	
523		TBALBOA	13A	13.800	G1	8.1	1.5	6.6	-6.6	1.0000	8.2	0.9824	10.9			1	6	
523		TBALBOA	13A	13.800	G2	8.1	1.5	6.6	-6.6	1.0000	8.2	0.9824	10.9			1	6	
523		TBALBOA	13A	13.800	G3	8.1	1.5	6.6	-6.6	1.0000	8.2	0.9824	10.9			1	6	
523		TBALBOA	13A	13.800	G4	8.1	1.5	6.6	-6.6	1.0000	8.2	0.9824	10.9			1	6	
523		TBALBOA	13A	13.800	G5	8.1	1.5	6.6	-6.6	1.0000	8.2	0.9824	10.9			1	6	
524		TBALBOA	13B	13.800	10	8.1	1.5	6.6	-6.6	1.0000	8.2	0.9824	10.9			1	6	
524		TBALBOA	13B	13.800	G6	8.1	1.5	6.6	-6.6	1.0000	8.2	0.9824	10.9			1	6	
524		TBALBOA	13B	13.800	G7	8.1	1.5	6.6	-6.6	1.0000	8.2	0.9824	10.9			1	6	
524		TBALBOA	13B	13.800	G8	8.1	1.5	6.6	-6.6	1.0000	8.2	0.9824	10.9			1	6	
524		TBALBOA	13B	13.800	G9	8.1	1.5	6.6	-6.6	1.0000	8.2	0.9824	10.9			1	6	
525		TATLANTIC13A	13.800	G1	36.0	6.9	28.5	0.0	1.0000	36.7	0.9820	47.5			1	6		
525		TATLANTIC13A	13.800	G2	36.0	6.9	28.5	0.0	1.0000	36.7	0.9820	47.5			1	6		
526		TATLANTIC13B	13.800	V1	18.3	5.4	15.0	0.0	1.0000	19.1	0.9598	25.0			1	6		
526		TATLANTIC13B	13.800	V2	18.3	5.4	15.0	0.0	1.0000	19.1	0.9598	25.0			1	6		
SUBSYSTEM TOTALS						1158.7	147.0	862.6	-340.6				1739.1					

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
 P. EXP-SIN CON C.A. JUNIO 2007 MHT7 ESC MOD DEM MAX INV  
 AÑO 2011 ESTUDIOS BÁSICOS-CONTINGENCIAS PMA-CEMPAN

THU, DEC 27 2007 11:51

AREA 7 [ACANAL ] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
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126	MIR13A	12.000	G1	8.5	0.0	5.0	0.0	1.0482	8.1	1.0000	13.5	2	7
127	MIR13B	12.000	G2	8.5	0.0	5.0	0.0	1.0482	8.1	1.0000	13.5	2	7
130	MIR13F	13.800	G5	10.6	4.1	8.0	0.0	1.0000	11.4	0.9334	27.7	2	7
134	MAD6A	6.9000	G1	9.6	1.0	6.0	-6.0	1.0000	9.6	0.9951	13.0	2	7
135	MAD6B	6.9000	G2	9.6	0.9	6.0	-6.0	1.0000	9.6	0.9952	13.0	2	7
136	MAD6C	6.9000	G3	9.6	0.9	6.0	-6.0	1.0000	9.6	0.9952	13.0	2	7
140	GAT6A	6.9000	G1	1.9	0.0	2.0	-2.0	1.0000	1.9	0.9998	4.1	2	7
140	GAT6A	6.9000	G2	1.9	0.0	2.0	-2.0	1.0000	1.9	0.9998	4.1	2	7
140	GAT6A	6.9000	G3	1.9	0.0	2.0	-2.0	1.0000	1.9	0.9998	4.1	2	7
141	GAT6B	6.9000	G4	3.8	-0.7	3.0	-3.0	1.0000	3.9	0.9836	5.6	2	7
141	GAT6B	6.9000	G5	3.8	-0.7	3.0	-3.0	1.0000	3.9	0.9836	6.2	2	7
141	GAT6B	6.9000	G6	3.8	-0.7	3.0	-3.0	1.0000	3.9	0.9836	6.2	2	7
SUBSYSTEM TOTALS				73.5	5.0	51.0	-33.0				124.2		



*Handwritten signature or initials.*



**PLAN DE EXPANSIÓN DEL SIN 2008  
AÑO 2011 ESCENARIO MODERADO DE DEMANDA MÁXIMA INVIERNO  
Contingencia Las Minas 2-Chilibre**



*de*



BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
8	LSA230	230.00	6	1.0169	233.89	11	M.N230	230.00	6	1.0319	237.34				
14	PRO230	230.00	6	1.0341	237.84	96	FOR230	230.00	6	1.0252	235.80				
100	BAY230	230.00	6	1.0057	231.31	144	CANJ230	230.00	6	1.0295	236.78				
147	GUASQ230	230.00	6	1.0294	236.75	148	VELAD230	230.00	6	1.0333	237.66				
190	CHANG230	230.00	6	1.0249	235.73	306	CHANG75	230.00	6	1.0245	235.62				
310	CONCEPCION230	230.00	6	1.0336	237.73	511	LGUIAS230	230.00	6	1.0049	231.13				
6000	FRONTER	230.00	6	1.0345	237.92										

BUSES WITH VOLTAGE LESS THAN 1.0200:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
1	PAN230	230.00	6	0.9721	223.59	3	PANII230	230.00	6	0.9808	225.59				
5	CHO230	230.00	6	0.9854	226.65	8	LSA230	230.00	6	1.0169	233.89				
100	BAY230	230.00	6	1.0057	231.31	103	COPESA23	230.00	6	0.9850	226.56				
105	PAN-AM23	230.00	6	0.9855	226.67	115	PACORA23	230.00	6	0.9881	227.25				
511	LGUIAS230	230.00	6	1.0049	231.13	515	PANPOWER230	230.00	6	0.9914	228.02				

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2	PAN115	115.00	6	1.0096	116.11	4	PANII115	115.00	6	1.0109	116.26				
6	CHO115	115.00	6	1.0228	117.62	9	LSA115	115.00	6	1.0189	117.17				
12	M.N115	115.00	6	1.0285	118.28	15	PRO115	115.00	6	1.0322	118.70				
18	CAC115	115.00	6	1.0091	116.05	19	C.V115	115.00	6	1.0021	115.24				
20	CH.AZUL	115.00	6	1.0292	118.36	26	LOC115	115.00	6	1.0007	115.08				
33	STM115	115.00	6	1.0080	115.91	48	TINAJ115	115.00	6	1.0062	115.72				
50	M.O115	115.00	6	1.0064	115.73	52	TOC115	115.00	6	1.0082	115.94				
54	LM1115	115.00	6	1.0398	119.58	55	LM2115	115.00	6	1.0409	119.71				
61	FFIELD	115.00	9	1.0336	118.86	87	CAL115	115.00	6	1.0423	119.87				
88	EST115	115.00	6	1.0455	120.23	92	L.V115	115.00	6	1.0436	120.01				
109	STA RITA115	115.00	6	1.0346	118.97	123	MIR115	115.00	7	1.0085	115.97				
154	CEMPAN15	115.00	6	1.0357	119.11	191	CHANG115	115.00	6	1.0202	117.32				
522	TBALBOA	115	115.00	6	1.0406	119.67									

BUSES WITH VOLTAGE LESS THAN 1.0200:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2	PAN115	115.00	6	1.0096	116.11	4	PANII115	115.00	6	1.0109	116.26				
9	LSA115	115.00	6	1.0189	117.17	18	CAC115	115.00	6	1.0091	116.05				
19	C.V115	115.00	6	1.0021	115.24	21	C.BAN115	115.00	6	0.9996	114.95				
23	CH115	115.00	6	0.9986	114.84	26	LOC115	115.00	6	1.0007	115.08				
30	MAR115	115.00	6	0.9991	114.90	33	STM115	115.00	6	1.0080	115.91				
37	SAN115	115.00	6	0.9986	114.84	48	TINAJ115	115.00	6	1.0062	115.72				
50	M.O115	115.00	6	1.0064	115.73	52	TOC115	115.00	6	1.0082	115.94				
123	MIR115	115.00	7	1.0085	115.97										



*Handwritten signature or initials.*

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
 P. EXP-SIN CON C.A. JUNIO ESC MOD DEM MAX INV  
 AÑO 2011 ESTUDIOS BÁSICOS-CONTINGENCIA LM2-CHI  
 AREA 6 [PANAMA ] MACHINE SUMMARY:

THU, DEC 27 2007 11:42

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X	T	R	A	N	GENTAP	ZONE	AREA	SWING	
66		BLM13B		13.800	V2	38.0	10.1	17.0	0.0	1.0100	38.9	0.9666	47.0						1	6			
67		BLM13C		13.800	V3	38.0	10.1	17.0	0.0	1.0100	38.9	0.9666	47.0						1	6			
68		BLM13D		13.800	V4	38.0	10.4	30.0	0.0	1.0100	39.0	0.9643	47.0						1	6			
70		TGJB13A		13.800	J5	31.0	7.1	20.0	0.0	1.0100	31.5	0.9746	39.4						1	6			
71		TGJB13B		13.800	J6	31.0	7.1	20.0	0.0	1.0100	31.5	0.9746	39.4						1	6			
72		BLMCCA		13.800	T8	31.0	8.0	20.0	0.0	1.0100	31.7	0.9679	50.0						1	6			
73		BLMCCB		13.800	V9	47.0	8.4	40.0	0.0	1.0100	47.3	0.9845	71.0						1	6			
90		EST-13L		13.800	E1	22.0	5.2	12.0	-5.0	1.0100	22.4	0.9732	27.0						1	6			
91		EST-13T		13.800	E2	22.0	5.2	12.0	-5.0	1.0100	22.4	0.9732	27.0						1	6			
94		LV-13.8L		13.800	L1	24.0	5.9	12.0	-5.0	1.0100	24.5	0.9710	27.0						1	6			
95		LV-13.8T		13.800	L2	24.0	5.9	12.0	-5.0	1.0100	24.5	0.9710	27.0						1	6			
97		FOR13A		13.800	F1	84.0	-43.9	50.0	-50.0	0.9710	97.6	0.8861	111.0						1	6			
98		FOR13B		13.800	F2	84.0	-43.9	50.0	-50.0	0.9710	97.6	0.8861	111.0						1	6			
101		BAY13A		13.800	B1	41.8	18.2	50.0	-25.0	0.9800	46.6	0.9169	96.0						1	6	SYST		
102		BAY13B		13.800	B2	41.8	18.2	50.0	-25.0	0.9800	46.6	0.9169	96.0						1	6			
106		PANAM13A		13.800	M1	14.0	4.8	9.0	0.0	0.9900	14.9	0.9460	20.7						1	6			
106		PANAM13A		13.800	M2	14.0	4.8	9.0	0.0	0.9900	14.9	0.9460	20.7						1	6			
106		PANAM13A		13.800	M3	14.0	4.8	9.0	0.0	0.9900	14.9	0.9460	20.7						1	6			
107		PANAM13B		13.800	M4	14.0	4.8	9.0	0.0	0.9900	14.9	0.9460	20.7						1	6			
107		PANAM13B		13.800	M5	14.0	4.8	9.0	0.0	0.9900	14.9	0.9460	20.7						1	6			
107		PANAM13B		13.800	M6	14.0	4.8	9.0	0.0	0.9900	14.9	0.9460	20.7						1	6			
108		BAY13C		13.800	B3	41.8	18.2	50.0	-25.0	0.9800	46.6	0.9169	100.0						1	6			
116		PACORA13		13.800	P1	15.0	8.8	8.8	0.0	0.9842	17.7	0.8618	21.7						1	6			
116		PACORA13		13.800	P2	15.0	8.8	8.8	0.0	0.9842	17.7	0.8618	21.7						1	6			
116		PACORA13		13.800	P3	15.0	8.8	8.8	0.0	0.9842	17.7	0.8618	21.7						1	6			
142		CANJ13A		13.800	C1	40.0	8.3	29.0	-29.0	1.0000	40.8	0.9793	69.0						1	6			
143		CANJ13B		13.800	C2	40.0	8.3	29.0	-29.0	1.0000	40.8	0.9793	69.0						1	6			
303		SIND13.8		13.800	S1	9.0	0.0	50.0	0.0	1.1218	8.0	1.0000	13.5						1	6			
307		CHANG75A		13.800	G1	65.0	-22.0	22.0	-22.0	0.9994	68.7	0.9472	118.6						1	6			
521		TCARIBE	13.813	13.800	G1	15.6	3.4	12.5	0.0	1.0000	16.0	0.9769	20.9						1	6			
521		TCARIBE	13.813	13.800	G2	15.6	3.4	12.5	0.0	1.0000	16.0	0.9769	20.9						1	6			
521		TCARIBE	13.813	13.800	G3	15.6	3.4	12.5	0.0	1.0000	16.0	0.9769	20.9						1	6			
523		TBALBOA	13A	13.800	G1	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9857	10.9						1	6			
523		TBALBOA	13A	13.800	G2	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9857	10.9						1	6			
523		TBALBOA	13A	13.800	G3	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9857	10.9						1	6			
523		TBALBOA	13A	13.800	G4	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9857	10.9						1	6			
523		TBALBOA	13A	13.800	G5	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9857	10.9						1	6			
524		TBALBOA	13B	13.800	10	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9857	10.9						1	6			
524		TBALBOA	13B	13.800	G6	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9857	10.9						1	6			
524		TBALBOA	13B	13.800	G7	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9857	10.9						1	6			
524		TBALBOA	13B	13.800	G8	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9857	10.9						1	6			
524		TBALBOA	13B	13.800	G9	8.1	1.4	6.6	-6.6	1.0000	8.2	0.9857	10.9						1	6			
525		TATLANTIC13A	13.800	G1	36.0	6.7	28.5	28.5	0.0	1.0000	36.6	0.9832	47.5						1	6			
525		TATLANTIC13A	13.800	G2	36.0	6.7	28.5	28.5	0.0	1.0000	36.6	0.9832	47.5						1	6			
526		TATLANTIC13B	13.800	V1	18.3	5.1	15.0	15.0	0.0	1.0000	19.0	0.9630	25.0						1	6			
526		TATLANTIC13B	13.800	V2	18.3	5.1	15.0	15.0	0.0	1.0000	19.0	0.9630	25.0						1	6			
SUBSYSTEM TOTALS						1158.9	147.7	862.6	-340.6				1739.1										

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
 P. EXP-SIN CON C.A. JUNIO 2007 ESC MOD DEM MAX INV  
 AÑO 2011 ESTUDIOS BÁSICOS-CONTINGENCIA LM2-CHI

THU, DEC 27 2007 11:42

AREA 7 [ACANAL ] MACHINE SUMMARY:

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X	T	R	A	N	GENTAP	ZONE	AREA	SWING
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*Handwritten signature or initials.*

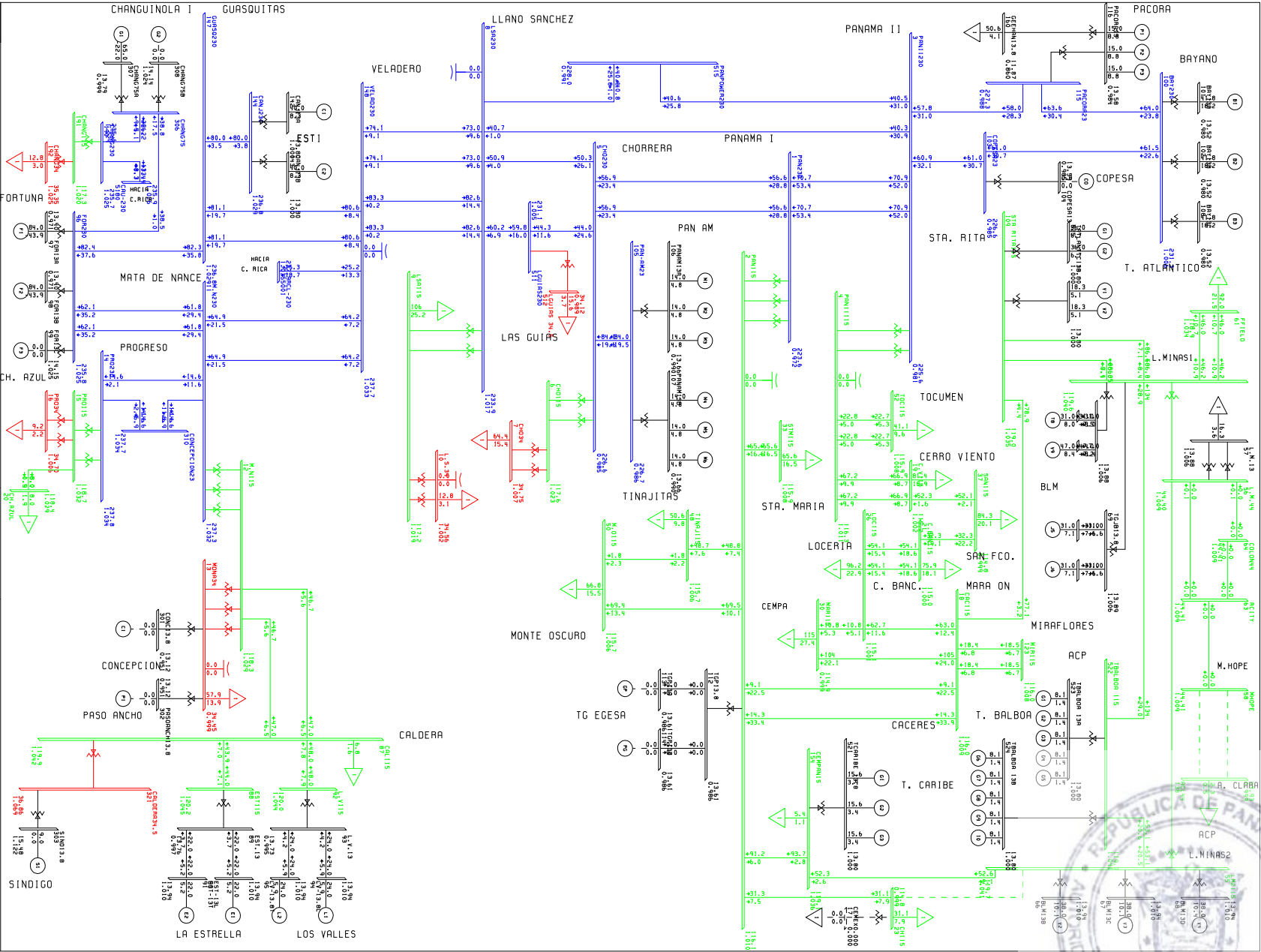
126	MIR13A	12.000	G1	8.5	0.0	5.0	0.0	1.0479	8.1	1.0000	13.5	2	7
127	MIR13B	12.000	G2	8.5	0.0	5.0	0.0	1.0479	8.1	1.0000	13.5	2	7
130	MIR13F	13.800	G5	10.6	4.2	8.0	0.0	1.0000	11.4	0.9295	27.7	2	7
134	MAD6A	6.9000	G1	9.6	1.0	6.0	-6.0	1.0000	9.6	0.9950	13.0	2	7
135	MAD6B	6.9000	G2	9.6	1.0	6.0	-6.0	1.0000	9.6	0.9950	13.0	2	7
136	MAD6C	6.9000	G3	9.6	1.0	6.0	-6.0	1.0000	9.6	0.9950	13.0	2	7
140	GAT6A	6.9000	G1	1.9	0.0	2.0	-2.0	1.0000	1.9	0.9997	4.1	2	7
140	GAT6A	6.9000	G2	1.9	0.0	2.0	-2.0	1.0000	1.9	0.9997	4.1	2	7
140	GAT6A	6.9000	G3	1.9	0.0	2.0	-2.0	1.0000	1.9	0.9997	4.1	2	7
141	GAT6B	6.9000	G4	3.8	-0.7	3.0	-3.0	1.0000	3.9	0.9838	5.6	2	7
141	GAT6B	6.9000	G5	3.8	-0.7	3.0	-3.0	1.0000	3.9	0.9838	6.2	2	7
141	GAT6B	6.9000	G6	3.8	-0.7	3.0	-3.0	1.0000	3.9	0.9838	6.2	2	7
SUBSYSTEM TOTALS				73.5	5.2	51.0	-33.0				124.2		



*Handwritten signature or initials.*

EXP-SIN CON C. R. JUNIO 2007 MH7 ESC MOD DEM MKX INV  
 P. O 2011 ESTUDIOS B SICOS-CONTINGENCIA LM2-CHI  
 THU, DEC 27 2007 11:45

BUS - VOLTAGE (KV/FU)  
 BRANCH - MW/VAR  
 EQUIPMENT - MW/VAR



Handwritten signature or initials in the bottom right corner.

**PLAN DE EXPANSIÓN DEL SIN 2008**  
**AÑO 2011 ESCENARIO MODERADO DE DEMANDA MÁXIMA INVIERNO**  
**Contingencia Las Minas 1-Santa Rita**



*de*

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
8		LSA230		230.00	6	1.0196	234.52	11		M.N230		230.00	6	1.0330	237.59
14		PRO230		230.00	6	1.0351	238.08	96		FOR230		230.00	6	1.0262	236.02
100		BAY230		230.00	6	1.0081	231.86	144		CANJ230		230.00	6	1.0306	237.05
147		GUASQ230		230.00	6	1.0305	237.02	148		VELAD230		230.00	6	1.0351	238.07
190		CHANG230		230.00	6	1.0255	235.87	306		CHANG75		230.00	6	1.0252	235.78
310		CONCEPCION230		230.00	6	1.0347	237.98	511		LGUIAS230		230.00	6	1.0081	231.86
6000		FRONTER		230.00	6	1.0355	238.16								

BUSES WITH VOLTAGE LESS THAN 1.0200:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
1		PAN230		230.00	6	0.9766	224.63	3		PANII230		230.00	6	0.9848	226.50
5		CHO230		230.00	6	0.9892	227.51	8		LSA230		230.00	6	1.0196	234.52
100		BAY230		230.00	6	1.0081	231.86	103		COPESA23		230.00	6	0.9887	227.41
105		PAN-AM23		230.00	6	0.9893	227.53	115		PACORA23		230.00	6	0.9916	228.07
511		LGUIAS230		230.00	6	1.0081	231.86	515		PANPOWER230		230.00	6	0.9951	228.88

BUSES WITH VOLTAGE GREATER THAN 1.0000:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2		PAN115		115.00	6	1.0154	116.77	4		PANII115		115.00	6	1.0153	116.76
6		CHO115		115.00	6	1.0268	118.08	9		LSA115		115.00	6	1.0218	117.50
12		M.N115		115.00	6	1.0294	118.38	15		PRO115		115.00	6	1.0332	118.82
18		CAC115		115.00	6	1.0148	116.70	19		C.V115		115.00	6	1.0070	115.80
20		CH.AZUL		115.00	6	1.0303	118.48	21		C.BAN115		115.00	6	1.0052	115.60
23		CH115		115.00	6	1.0186	117.14	26		LOC115		115.00	6	1.0063	115.72
30		MAR115		115.00	6	1.0048	115.55	33		STM115		115.00	6	1.0137	116.57
37		SAN115		115.00	6	1.0041	115.48	48		TINAJ115		115.00	6	1.0120	116.38
50		M.O115		115.00	6	1.0121	116.39	52		TOC115		115.00	6	1.0126	116.45
54		LM115		115.00	6	1.0409	119.70	55		LM2115		115.00	6	1.0413	119.75
61		FFIELD		115.00	9	1.0346	118.98	87		CAL115		115.00	6	1.0429	119.93
88		EST115		115.00	6	1.0460	120.29	92		L.V115		115.00	6	1.0441	120.07
109		STA RITA115		115.00	6	1.0348	119.01	123		MIR115		115.00	7	1.0138	116.59
154		CEMPAN15		115.00	6	1.0379	119.36	191		CHANG115		115.00	6	1.0208	117.40
522		TBALBOA 115		115.00	6	1.0413	119.75								

BUSES WITH VOLTAGE LESS THAN 1.0200:

BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)	BUS#	X--	NAME	--X	BASKV	AREA	V(PU)	V(KV)
2		PAN115		115.00	6	1.0154	116.77	4		PANII115		115.00	6	1.0153	116.76
18		CAC115		115.00	6	1.0148	116.70	19		C.V115		115.00	6	1.0070	115.80
21		C.BAN115		115.00	6	1.0052	115.60	23		CH115		115.00	6	1.0186	117.14
26		LOC115		115.00	6	1.0063	115.72	30		MAR115		115.00	6	1.0048	115.55
33		STM115		115.00	6	1.0137	116.57	37		SAN115		115.00	6	1.0041	115.48
48		TINAJ115		115.00	6	1.0120	116.38	50		M.O115		115.00	6	1.0121	116.39
52		TOC115		115.00	6	1.0126	116.45	123		MIR115		115.00	7	1.0138	116.59



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PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
P. EXP-SIN CON C.A. JUNIO 2007 ESC MOD DEM MAX INV  
AÑO 2011 ESTUDIOS BÁSICOS-CONTINGENCIA LM1-STA RITA  
AREA 6 [PANAMA ] MACHINE SUMMARY:

THU, DEC 27 2007 11:46

BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
66		BLM13B		13.800	V2	38.0	9.9	17.0	0.0	1.0100	38.9	0.9676	47.0			1	6	
67		BLM13C		13.800	V3	38.0	9.9	17.0	0.0	1.0100	38.9	0.9676	47.0			1	6	
68		BLM13D		13.800	V4	38.0	10.3	30.0	0.0	1.0100	39.0	0.9654	47.0			1	6	
70		TGJB13A		13.800	J5	31.0	6.8	20.0	0.0	1.0100	31.4	0.9765	39.4			1	6	
71		TGJB13B		13.800	J6	31.0	6.8	20.0	0.0	1.0100	31.4	0.9765	39.4			1	6	
72		BLMCCA		13.800	T8	31.0	7.8	20.0	0.0	1.0100	31.6	0.9700	50.0			1	6	
73		BLMCCB		13.800	V9	47.0	8.1	40.0	0.0	1.0100	47.2	0.9855	71.0			1	6	
90		EST-13L		13.800	E1	22.0	5.0	12.0	-5.0	1.0100	22.3	0.9747	27.0			1	6	
91		EST-13T		13.800	E2	22.0	5.0	12.0	-5.0	1.0100	22.3	0.9747	27.0			1	6	
94		LV-13.8L		13.800	L1	24.0	5.8	12.0	-5.0	1.0100	24.4	0.9724	27.0			1	6	
95		LV-13.8T		13.800	L2	24.0	5.8	12.0	-5.0	1.0100	24.4	0.9724	27.0			1	6	
97		FOR13A		13.800	F1	84.0	-44.8	50.0	-50.0	0.9710	98.1	0.8823	111.0			1	6	
98		FOR13B		13.800	F2	84.0	-44.8	50.0	-50.0	0.9710	98.1	0.8823	111.0			1	6	
101		BAY13A		13.800	B1	41.2	16.4	50.0	-25.0	0.9800	45.3	0.9288	96.0			1	6	SYST
102		BAY13B		13.800	B2	41.2	16.4	50.0	-25.0	0.9800	45.3	0.9288	96.0			1	6	
106		PANAM13A		13.800	M1	14.0	4.3	9.0	0.0	0.9900	14.8	0.9564	20.7			1	6	
106		PANAM13A		13.800	M2	14.0	4.3	9.0	0.0	0.9900	14.8	0.9564	20.7			1	6	
106		PANAM13A		13.800	M3	14.0	4.3	9.0	0.0	0.9900	14.8	0.9564	20.7			1	6	
107		PANAM13B		13.800	M4	14.0	4.3	9.0	0.0	0.9900	14.8	0.9564	20.7			1	6	
107		PANAM13B		13.800	M5	14.0	4.3	9.0	0.0	0.9900	14.8	0.9564	20.7			1	6	
107		PANAM13B		13.800	M6	14.0	4.3	9.0	0.0	0.9900	14.8	0.9564	20.7			1	6	
108		BAY13C		13.800	B3	41.2	16.4	50.0	-25.0	0.9800	45.3	0.9288	100.0			1	6	
116		PACORA13		13.800	P1	15.0	8.8	8.8	0.0	0.9885	17.6	0.8618	21.7			1	6	
116		PACORA13		13.800	P2	15.0	8.8	8.8	0.0	0.9885	17.6	0.8618	21.7			1	6	
116		PACORA13		13.800	P3	15.0	8.8	8.8	0.0	0.9885	17.6	0.8618	21.7			1	6	
142		CANJ13A		13.800	C1	40.0	8.1	29.0	-29.0	1.0000	40.8	0.9802	69.0			1	6	
143		CANJ13B		13.800	C2	40.0	8.1	29.0	-29.0	1.0000	40.8	0.9802	69.0			1	6	
303		SIND13.8		13.800	S1	9.0	0.0	50.0	0.0	1.1224	8.0	1.0000	13.5			1	6	
307		CHANG75A		13.800	G1	65.0	-22.0	22.0	-22.0	1.0001	68.6	0.9472	118.6			1	6	
521		TCARIBE	13.813	13.800	G1	15.6	3.0	12.5	0.0	1.0000	15.9	0.9823	20.9			1	6	
521		TCARIBE	13.813	13.800	G2	15.6	3.0	12.5	0.0	1.0000	15.9	0.9823	20.9			1	6	
521		TCARIBE	13.813	13.800	G3	15.6	3.0	12.5	0.0	1.0000	15.9	0.9823	20.9			1	6	
523		TBALBOA	13A	13.800	G1	8.1	1.3	6.6	-6.6	1.0000	8.2	0.9874	10.9			1	6	
523		TBALBOA	13A	13.800	G2	8.1	1.3	6.6	-6.6	1.0000	8.2	0.9874	10.9			1	6	
523		TBALBOA	13A	13.800	G3	8.1	1.3	6.6	-6.6	1.0000	8.2	0.9874	10.9			1	6	
523		TBALBOA	13A	13.800	G4	8.1	1.3	6.6	-6.6	1.0000	8.2	0.9874	10.9			1	6	
523		TBALBOA	13A	13.800	G5	8.1	1.3	6.6	-6.6	1.0000	8.2	0.9874	10.9			1	6	
524		TBALBOA	13B	13.800	10	8.1	1.3	6.6	-6.6	1.0000	8.2	0.9874	10.9			1	6	
524		TBALBOA	13B	13.800	G6	8.1	1.3	6.6	-6.6	1.0000	8.2	0.9874	10.9			1	6	
524		TBALBOA	13B	13.800	G7	8.1	1.3	6.6	-6.6	1.0000	8.2	0.9874	10.9			1	6	
524		TBALBOA	13B	13.800	G8	8.1	1.3	6.6	-6.6	1.0000	8.2	0.9874	10.9			1	6	
524		TBALBOA	13B	13.800	G9	8.1	1.3	6.6	-6.6	1.0000	8.2	0.9874	10.9			1	6	
525		TATLANTIC13A	13.800	G1	36.0	6.6	28.5	0.0	1.0000	36.6	0.9836	47.5			1	6		
525		TATLANTIC13A	13.800	G2	36.0	6.6	28.5	0.0	1.0000	36.6	0.9836	47.5			1	6		
526		TATLANTIC13B	13.800	V1	18.3	5.0	15.0	0.0	1.0000	19.0	0.9642	25.0			1	6		
526		TATLANTIC13B	13.800	V2	18.3	5.0	15.0	0.0	1.0000	19.0	0.9642	25.0			1	6		
SUBSYSTEM TOTALS						1157.0	132.4	862.6	-340.6				1739.1					

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
P. EXP-SIN CON C.A. JUNIO 2007 MHT7 ESC MOD DEM MAX INV  
AÑO 2011 ESTUDIOS BÁSICOS-CONTINGENCIA LM1-STA RITA  
AREA 7 [ACANAL ] MACHINE SUMMARY:

THU, DEC 27 2007 11:46



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BUS#	X--	NAME	--X	BASKV	ID	MW	MVAR	QMAX	QMIN	ETERM	CURRENT	PF	MVABASE	X T R A N	GENTAP	ZONE	AREA	SWING
126		MIR13A		12.000	G1	8.5	0.0	5.0	0.0	1.0507	8.1	1.0000	13.5			2	7	
127		MIR13B		12.000	G2	8.5	0.0	5.0	0.0	1.0508	8.1	1.0000	13.5			2	7	
130		MIR13F		13.800	G5	10.6	3.0	8.0	0.0	1.0000	11.0	0.9627	27.7			2	7	
134		MAD6A		6.9000	G1	9.6	0.8	6.0	-6.0	1.0000	9.6	0.9964	13.0			2	7	
135		MAD6B		6.9000	G2	9.6	0.8	6.0	-6.0	1.0000	9.6	0.9965	13.0			2	7	
136		MAD6C		6.9000	G3	9.6	0.8	6.0	-6.0	1.0000	9.6	0.9964	13.0			2	7	
140		GAT6A		6.9000	G1	1.9	0.0	2.0	-2.0	1.0000	1.9	1.0000	4.1			2	7	
140		GAT6A		6.9000	G2	1.9	0.0	2.0	-2.0	1.0000	1.9	1.0000	4.1			2	7	
140		GAT6A		6.9000	G3	1.9	0.0	2.0	-2.0	1.0000	1.9	1.0000	4.1			2	7	
141		GAT6B		6.9000	G4	3.8	-0.7	3.0	-3.0	1.0000	3.9	0.9818	5.6			2	7	
141		GAT6B		6.9000	G5	3.8	-0.7	3.0	-3.0	1.0000	3.9	0.9818	6.2			2	7	
141		GAT6B		6.9000	G6	3.8	-0.7	3.0	-3.0	1.0000	3.9	0.9818	6.2			2	7	
SUBSYSTEM TOTALS						73.5	3.2	51.0	-33.0				124.2					



*Handwritten signature or initials.*







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