

PV Study Report  
San Luis Valley Substation Second 230 kV Source  
January 2004



PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E TUE, DEC 09 2003 12:05  
SAN LUIS VALLEY SECOND SOURCE STUDY \* 03SLV0000HS BUS DATA  
EXISTING SYSTEM

NAME	BSKV	BUS#	CODE	LOADS	VOLT	ANGLE	S	H	U	N	T	AREA	ZONE	OWNER
ALMSA ST	69.000	70024	1	1	1.0161	37.8	0.0	0.0	70	710	65			
ALMSA TM	69.000	70026	1	0	1.0177	37.8	0.0	0.0	70	710	65			
ALMSA TM	115.00	70025	1	1	1.0359	38.9	0.0	0.0	70	710	65			
ALMSACT	113.800	70485	-2	0	0.9789	37.8	0.0	0.0	70	710	65			
ALMSACT	213.800	70486	-2	0	0.9964	38.9	0.0	0.0	70	710	65			
ANSEL TS	69.000	70028	1	1	1.0169	38.9	0.0	0.0	70	710	65			
ANTONITO	69.000	70029	1	1	1.0004	37.2	0.0	0.0	70	710	65			
CARMEL	69.000	70090	1	1	1.0254	38.3	0.0	0.0	70	710	65			
CENTER	69.000	70092	1	1	1.0083	38.1	0.0	0.0	70	710	65			
COCENTER	69.000	70118	1	2	1.0166	38.9	0.0	0.0	70	710	65			
CREEDE	69.000	70129	1	1	1.0309	38.9	0.0	0.0	70	710	65			
DELNORTE	69.000	70143	1	1	1.0123	38.8	0.0	0.0	70	710	65			
FTGARLND	69.000	70187	1	1	0.9946	37.3	0.0	0.0	70	710	65			
HILANDSL	69.000	70221	1	1	1.0316	39.0	0.0	0.0	70	710	65			
HOMELAKE	69.000	70228	1	1	1.0152	38.5	0.0	0.0	70	710	65			
HOOPER	69.000	70229	1	1	1.0076	38.1	0.0	0.0	70	710	65			
HOOPERTP	69.000	70230	1	0	1.0094	38.2	0.0	0.0	70	710	65			
KERBERCK	69.000	70509	1	1	1.0287	41.4	0.0	0.0	70	710	65			
LAGARITA	69.000	70245	1	1	1.0038	37.8	0.0	0.0	70	710	65			
MEARSJCT	69.000	70507	1	1	1.0263	41.6	0.0	0.0	70	710	65			
MIRGEJCT	69.000	70505	1	0	1.0007	37.9	0.0	0.0	70	710	65			
MOFFAT	69.000	70289	1	2	1.0029	38.0	0.0	0.0	70	710	65			
MOSCA	69.000	70292	1	1	1.0170	38.5	0.0	0.0	70	710	65			
OLD16TAP	69.000	70186	1	0	1.0155	37.8	0.0	0.0	70	710	65			
OLD40TAP	69.000	70511	1	0	1.0174	37.8	0.0	0.0	70	710	65			
PLAZA	69.000	70325	1	1	1.0016	37.8	0.0	0.0	70	710	65			
PONCHA	69.000	70326	1	0	1.0256	41.6	0.0	0.0	70	710	65			
RAMON	69.000	70348	1	0	1.0324	39.1	0.0	0.0	70	710	65			
RAMON	115.00	70347	1	0	1.0326	39.3	0.0	0.0	70	710	65			
REATAP	69.000	70552	1	0	1.0103	37.5	0.0	0.0	70	710	65			
RIOGRAND	69.000	70360	1	1	1.0130	38.8	0.0	0.0	70	710	65			
RIOGRDTP	69.000	70361	1	0	1.0158	38.9	0.0	0.0	70	710	65			
ROMEO	69.000	70367	1	1	1.0027	37.2	0.0	0.0	70	710	65			
S.ACACIO	69.000	70373	1	1	1.0256	38.0	0.0	0.0	70	710	65			
SAGUACHE	69.000	70506	1	1	0.9965	37.9	0.0	0.0	70	710	65			
SAN LUIS	69.000	70376	1	0	1.0193	38.8	0.0	0.0	70	710	65			
SAN LUIS	115.00	70374	1	0	1.0311	39.6	0.0	0.0	70	710	65			
SAN LUIS	230.00	70375	1	0	1.0743	40.1	0.0	0.0	70	710	65			
SARGENT	69.000	70380	1	0	1.0165	39.0	0.0	0.0	70	710	65			
SARGENT	115.00	70379	1	1	1.0322	39.6	0.0	0.0	70	710	65			
SFORK SL	69.000	70383	1	1	1.0323	39.0	0.0	0.0	70	710	65			
SMELTER	115.00	70394	1	1	1.0341	41.6	0.0	0.0	70	710	66			
STANLEY	115.00	70411	1	1	1.0311	39.6	0.0	0.0	70	710	65			
STOCKADE	69.000	70414	1	1	1.0263	38.2	0.0	0.0	70	710	65			
VILLA	69.000	70508	1	0	1.0284	41.4	0.0	0.0	70	710	65			
WAVERLY	69.000	70468	1	0	1.0264	38.4	0.0	0.0	70	710	65			
WAVERLY	115.00	70467	1	0	1.0291	39.2	0.0	0.0	70	710	65			
ZINZER	69.000	70477	1	1	1.0225	38.1	0.0	0.0	70	710	65			

# PV Study Report

San Luis Valley Substation Second 230 kV Source

January 2004



**TRI-STATE**

Generation and Transmission  
Association, Inc.

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E										TUE, DEC 09 2003 12:05					
SAN LUIS VALLEY SECOND SOURCE STUDY * 03SLV0000HS										LOAD DATA					
EXISTING SYSTEM															
NAME	BSKV	BUS#	ID	CD	ST	PSI	MVA-LOAD		CUR-LOAD		Y - LOAD		AR	ZO	OWN
ALMSA	ST69.0	70024	1	1	1	1.000	1.3	0.7	0.0	0.0	0.0	0.0	70	710	1
ALMSA	TM 115	70025	1	1	1	1.000	5.1	1.4	0.0	0.0	0.0	0.0	70	710	1
ANSEL	TS69.0	70028	TS	1	1	1.000	1.7	0.6	0.0	0.0	0.0	0.0	70	710	1
ANTONITO	69.0	70029	1	1	1	1.000	1.1	0.5	0.0	0.0	0.0	0.0	70	710	1
CARMEL	69.0	70090	TS	1	1	1.000	4.7	1.5	0.0	0.0	0.0	0.0	70	710	1
CENTER	69.0	70092	TS	1	1	1.000	4.8	1.6	0.0	0.0	0.0	0.0	70	710	1
COCENTER	69.0	70118	1	1	1	1.000	0.2	0.0	0.0	0.0	0.0	0.0	70	710	65
COCENTER	69.0	70118	WA	1	1	1.000	0.4	0.1	0.0	0.0	0.0	0.0	70	710	65
CREEDE	69.0	70129	TS	1	1	1.000	0.5	0.2	0.0	0.0	0.0	0.0	70	710	1
DELNORTE	69.0	70143	1	1	1	1.000	0.6	0.3	0.0	0.0	0.0	0.0	70	710	1
FTGARLND	69.0	70187	1	1	1	1.000	3.3	1.2	0.0	0.0	0.0	0.0	70	710	1
HILANDSL	69.0	70221	TS	1	1	1.000	1.0	0.3	0.0	0.0	0.0	0.0	70	710	1
HOMELAKE	69.0	70228	1	1	1	1.000	1.5	0.6	0.0	0.0	0.0	0.0	70	710	1
HOOPER	69.0	70229	TS	1	1	1.000	2.8	0.9	0.0	0.0	0.0	0.0	70	710	1
KERBERCK	69.0	70509	1	1	1	1.000	0.0	0.0	0.0	0.0	0.0	0.0	70	710	65
LA SECPA	69.0	70243	TS	1	1	1.000	0.2	0.1	0.0	0.0	0.0	0.0	70	710	1
LAGARITA	69.0	70245	TS	1	1	1.000	3.1	1.0	0.0	0.0	0.0	0.0	70	710	1
MEARSJCT	69.0	70507	TS	1	0	1.000	0.0	0.0	0.0	0.0	0.0	0.0	70	710	1
MOFFAT	69.0	70289	1	1	1	1.000	0.0	0.0	0.0	0.0	0.0	0.0	70	710	65
MOFFAT	69.0	70289	TS	1	1	1.000	1.2	0.4	0.0	0.0	0.0	0.0	70	710	1
MOSCA	69.0	70292	1	1	1	1.000	0.4	0.1	0.0	0.0	0.0	0.0	70	710	1
PLAZA	69.0	70325	TS	1	1	1.000	0.9	0.3	0.0	0.0	0.0	0.0	70	710	1
PONCHA	115	70327	1	1	1	1.000	2.0	0.2	0.0	0.0	0.0	0.0	70	710	65
RIOGRAND	69.0	70360	1	1	1	1.000	1.6	0.7	0.0	0.0	0.0	0.0	70	710	1
ROMEO	69.0	70367	1	1	1	1.000	1.5	0.5	0.0	0.0	0.0	0.0	70	710	1
S.ACACIO	69.0	70373	TS	1	1	1.000	0.9	0.3	0.0	0.0	0.0	0.0	70	710	1
SAGUACHE	69.0	70506	1	1	1	1.000	1.1	0.4	0.0	0.0	0.0	0.0	70	710	1
SARGENT	115	70379	1	1	1	1.000	1.4	1.0	0.0	0.0	0.0	0.0	70	710	1
SFORK	SL69.0	70383	TS	1	1	1.000	0.7	0.2	0.0	0.0	0.0	0.0	70	710	1
SMELTER	115	70394	TS	1	1	1.000	0.9	0.3	0.0	0.0	0.0	0.0	70	710	1
STANLEY	115	70411	TS	1	1	1.000	3.6	1.2	0.0	0.0	0.0	0.0	70	710	1
STOCKADE	69.0	70414	TS	1	1	1.000	0.6	0.2	0.0	0.0	0.0	0.0	70	710	1
* ZINZER 69.0 70477 TS 1 1 1.000 1.0 0.3															
0.0 0.0 0.0 0.0 70 710 1															

PV Study Report  
San Luis Valley Substation Second 230 kV Source  
January 2004



PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E TUE, DEC 09 2003 12:05  
SAN LUIS VALLEY SECOND SOURCE STUDY \* 03SLV0000HS AREA DATA  
EXISTING SYSTEM

X-- AREA --X X-----		AREA SWING		-----X X---		DESIRED ---X						
	BUS#	NAME	BSKV	PGEN	PMAX	PMIN	INTERCH	TOLER	BUSES	LOADS	DCBUS	
10	NEW MEXI	11114	NEWMANG3	13.8	65.7	101.0	30.0	-625.0	1.0	846	314	0
14	ARIZONA	15903	AGUAFR	318.0	140.5	183.0	26.0	2560.4	1.0	511	249	0
18	NEVADA	18259	CLARK 9	13.8	54.1	85.0	32.0	-967.1	1.0	331	179	0
19	WAPA L.C	19023	HOOVERA3	16.5	108.2	130.0	0.0	3105.0	1.0	110	25	0
20	MEXICO-C	20006	PJZ-U5	15.0	134.8	160.0	0.0	0.0	1.0	153	114	0
21	IMPERIAL	21030	ELSTM 4	13.8	71.2	80.0	0.0	157.1	1.0	82	21	0
22	SANDIEGO	22788	SOUTHBY3	20.0	169.0	174.0	0.0	-1762.0	1.0	247	114	0
24	SOCALIF	24004	ALAMT4	G18.0	259.3	320.0	0.0	-6184.7	1.0	583	130	0
26	LADWP	26004	CASTAILG	18.0	120.8	212.0	0.0	-2424.9	1.0	114	21	6
30	PG AND E	30000	PTSB 7	20.0	526.1	710.0	0.0	-1660.0	1.0	2621	1565	0
40	NORTHWES	40296	COULEE2	215.0	660.9	822.0	0.0	4365.0	1.0	2932	1733	6
50	B.C.HYDR	50499	GMS G5	13.8	221.1	261.0	0.0	2754.0	1.0	1116	428	0
52	AQUILA	52163	WAN-G3	14.4	111.0	118.8	0.0	-54.0	1.0	257	66	0
54	ALBERTA	54143	BRAZ#1	913.7	152.5	160.0	0.0	-400.0	1.0	1113	524	0
60	IDAHO	60100	BRWNL 5	13.8	178.0	275.0	0.0	506.0	1.0	162	67	0
62	MONTANA	62048	COLSTP	326.0	714.5	823.0	0.0	1200.0	1.0	307	201	0
63	WAPA U.M	63005	FT PECK1	13.8	52.7	61.8	0.0	78.0	1.0	15	18	0
64	SIERRA	64119	TRACY G3	13.8	48.9	113.0	0.0	-520.0	1.0	256	117	0
65	PACE	66055	NAUGT G1	18.0	105.5	167.0	73.0	-440.1	1.0	596	292	0
70	PSCOLORA	70105	CHEROK3	20.0	98.0	165.0	50.0	-1110.8	1.0	513	370	0
73	WAPA R.M	73129	MBPP-1	24.0	481.6	550.0	0.0	1423.1	1.0	640	361	0
					SUMMATION:		0.0					

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E TUE, DEC 09 2003 12:05  
SAN LUIS VALLEY SECOND SOURCE STUDY \* 03SLV0000HS ZONE DATA  
EXISTING SYSTEM

X-- ZONE --X	BUSES	LOADS	DC BUSES
710 ZONESL	48	33	0

# **PV Study Report**

San Luis Valley Substation Second 230 kV Source  
January 2004



**TRI-STATE**  
Generation and Transmission  
Association, Inc.

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E

TUE, DEC 09 2003 12:05

SAN LUIS VALLEY SECOND SOURCE STUDY \* 03SLV0000HS

OWNER DATA

EXISTING SYSTEM

X-- OWNER	-X BUSES	LOADS	MACHINES	BRANCHES	DC BUSES	FACTS	DEVS	VSC	DC
1 NON	73	148	17	416	12		0		0
2 APS	154	87	55	156	0		0		0
3 AEP	27	17	7	36	0		0		0
4 DSW	132	51	24	189	0		0		0
5 EMA	1	0	0	1	0		0		0
6 LCA	1	1	0	2	0		0		0
7 PAC	512	245	56	686	0		0		0
8 UAMP	63	30	14	80	0		0		0
9	3	3	3	0	0		0		0
10 BCH	1116	428	134	1462	0		0		0
11 IPC	148	52	56	211	0		0		0
13 PPL	239	163	29	329	0		0		0
14 BPA	704	217	37	1020	0		0		0
15 SCL	40	28	21	71	0		0		0
16 IID	82	21	33	103	0		0		0
17 N2	2	2	0	20	0		0		0
18 N3	15	24	0	2	0		0		0
19 N8	46	31	0	48	0		0		0
20 N4	51	34	0	93	0		0		0
21 N6	10	7	0	10	0		0		0
22 N5	10	3	0	11	0		0		0
23 N9	184	67	63	248	0		0		0
24 N1	8	9	0	5	0		0		0
25 N7	0	0	0	1	0		0		0
26 WALM	184	27	1	533	0		0		0
27 WAUC	21	0	4	7	0		0		0
28 NWA	8	6	0	11	0		0		0
29 AVA	270	140	53	363	0		0		0
30 PSE	475	331	39	592	0		0		0
31 DOE	5	5	0	7	0		0		0
32 PG	332	163	42	394	0		0		0
33 EWE	48	33	9	52	0		0		0
34 SPD	115	75	3	130	0		0		0
35 GPD	82	40	21	103	0		0		0
36 CPD	20	8	31	34	0		0		0
37 INL	15	35	0	0	0		0		0
38 TCL	147	61	15	185	0		0		0
39 WPS	1	3	3	1	0		0		0
40 USN	5	5	0	1	0		0		0
41 CLP	3	9	0	1	0		0		0
42 CLA	13	12	0	16	0		0		0
43 COE	45	0	130	79	0		0		0
44 PDO	12	6	4	11	0		0		0
45 WPD	3	3	0	1	0		0		0
46 DPD	15	11	10	17	0		0		0
47 CCP	6	12	0	5	0		0		0
48 GH	9	9	1	8	0		0		0
49 CLK	67	45	1	75	0		0		0
50 NPR	117	0	146	48	0		0		0
51 EMP	10	10	1	3	0		0		0
52 BBE	259	82	27	281	0		0		0
53 KEC	1	11	0	1	0		0		0

*PV Study Report*  
*San Luis Valley Substation Second 230 kV Source*  
*January 2004*



54 LEW	29	18	5	28	0	0	0
55 CCC	9	13	0	5	0	0	0
56 SUB	5	7	0	5	0	0	0
57 HAR	12	10	0	11	0	0	0
58 SDS	0	2	0	0	0	0	0
59 SPP	255	116	28	315	0	0	0
60 BHPL	328	136	286	372	0	0	0
61 ROS	3	3	0	5	0	0	0
62 DWR	51	3	52	47	0	0	0
63 SMD	98	33	28	120	0	0	0
64 COT	9	0	2	9	0	0	0
65 PSC	428	207	86	406	0	0	0
66 WP	73	40	0	89	0	0	0
67 ATL	0	21	0	0	0	0	0
68 IM	15	16	0	17	0	0	0
69 PPLG	17	4	19	2	0	0	0
70 R7	0	0	0	1	0	0	0
71 TS	0	9	0	0	0	0	0
73 TRI	200	164	14	35	0	0	0
74 SCE	539	111	228	724	0	0	0
76 AIES	1113	524	194	1387	0	0	0
77 WAUM	20	15	1	18	0	0	0
78 MPC	261	169	0	399	0	0	0
79 TEP	130	67	13	174	0	0	0
80 SRP	138	50	58	222	0	0	0
81 LAD	114	21	35	156	0	0	0
85 MFR	1	3	0	2	0	0	0
86 KLI	0	2	0	1	0	0	0
87 UEC	0	0	0	1	0	0	0
90 PGE	2127	1323	161	2821	0	0	0
91 R2	0	0	0	3	0	0	0
92 NCP	27	9	12	16	0	0	0
93 PRP	11	19	0	4	0	0	0
94 BASI	37	23	15	29	0	0	0
95 CSU	48	25	13	27	0	0	0
97 BKB	0	0	0	30	0	0	0
98 BHP	0	0	0	2	0	0	0
99 BOR	0	0	0	3	0	0	0
100 CEC	0	10	0	1	0	0	0
101 CHW	0	1	0	1	0	0	0
102 FAB	2	0	0	2	0	0	0
103 TCE	0	0	0	11	0	0	0
104 ICE	0	4	0	0	0	0	0
105 LEC	0	9	0	5	0	0	0
106 NLI	5	15	0	0	0	0	0
107 MDR	0	3	0	0	0	0	0
108 PLM	0	1	0	0	0	0	0
109 R6	0	0	0	1	0	0	0
110 OTC	4	4	0	1	0	0	0
111 CFE	172	114	35	286	0	0	0
112	0	0	0	3	0	0	0
113 CUC	4	0	6	0	0	0	0
115	0	8	0	2	0	0	0
125 BPE	213	91	17	269	0	0	0
126 LAC	16	7	3	17	0	0	0
127 PGT	102	37	9	56	0	0	0

**PV Study Report**

San Luis Valley Substation Second 230 kV Source  
January 2004



**TRI-STATE**  
Generation and Transmission  
Association, Inc.

128	US	1	1	0	0	0	0	0
129	PN2	439	154	1	496	0	0	0
130	PN1	31	10	12	50	0	0	0
131	NTU	2	2	0	0	0	0	0
132	SPS	2	2	0	1	0	0	0
133	TNP	21	10	1	30	0	0	0
134	MID	55	33	14	80	0	0	0
135	MWD	26	0	58	30	0	0	0
136	SDG	247	114	55	378	0	0	0
137	TID	42	19	8	54	0	0	0
308		0	0	0	4	0	0	0
311		0	0	0	1	0	0	0
312	WASN	47	15	35	79	0	0	0
313	RDG	58	31	8	63	0	0	0
318		0	0	0	7	0	0	0
319		0	0	0	4	0	0	0
338		0	0	0	4	0	0	0
345		0	0	0	1	0	0	0
401	BPD	22	23	1	12	0	0	0
402	BRE	5	14	0	1	0	0	0
403	CLT	3	3	2	1	0	0	0
404	COR	4	8	0	2	0	0	0
405	CPI	3	13	0	0	0	0	0
406	CPU	0	0	0	1	0	0	0
407	CRP	4	9	0	0	0	0	0
408	DEC	10	9	0	11	0	0	0
409	ELM	3	4	0	0	0	0	0
411	FRK	11	12	0	6	0	0	0
412	KLI	5	8	1	4	0	0	0
414	LKV	3	3	0	0	0	0	0
416	MCM	4	7	0	0	0	0	0
417	MEC	0	4	0	2	0	0	0
418	MN3	3	6	0	0	0	0	0
419	OKP	11	11	0	13	0	0	0
420	OPL	22	10	0	25	0	0	0
423	TIL	4	9	0	0	0	0	0
424	UMT	3	9	0	2	0	0	0
435	MN1	0	2	0	0	0	0	0
438	PACP	1	6	0	0	0	0	0
439	PAN	0	2	0	0	0	0	0
440	PEN	0	7	0	0	0	0	0
441	SEC	3	4	0	0	0	0	0
443	VID	3	3	0	0	0	0	0
444	BLC	0	5	0	0	0	0	0
445	CNE	0	4	0	0	0	0	0
446	FLT	3	7	0	0	0	0	0
447	FOR	1	3	0	0	0	0	0
448	RAT	2	0	0	0	0	0	0
449	CCN	2	3	0	0	0	0	0
450	MSV	0	2	0	0	0	0	0
451	FPLE	0	0	12	0	0	0	0
452	HPP	4	0	0	4	0	0	0
453	ESI	2	0	1	1	0	0	0
454	WASC	8	9	2	3	0	0	0
455	CREA	4	7	0	1	0	0	0
456	SUVL	3	6	0	0	0	0	0

*PV Study Report*  
*San Luis Valley Substation Second 230 kV Source*  
*January 2004*



**TRI-STATE**  
 Generation and Transmission  
 Association, Inc.

458	FRED	0	0	2	3	0	0	0
460	TACG	7	3	5	6	0	0	0
461	KFAL	7	0	0	4	0	0	0
463	TRCB	6	1	3	6	0	0	0
464	GOLD	2	0	2	3	0	0	0
465	DUKE	4	2	3	4	0	0	0
468		4	0	0	4	0	0	0
470		0	0	3	0	0	0	0
473	MORR	1	0	1	0	0	0	0
474	KLAM	0	0	2	0	0	0	0
476	PMOR	2	0	0	0	0	0	0
620	MASI	1	1	0	0	0	0	0
621	MGLE	1	0	0	0	0	0	0
622	MSRE	1	1	0	0	0	0	0
623	MBRE	1	0	0	0	0	0	0
624	MFE	1	0	0	0	0	0	0
625	MYVE	3	0	0	0	0	0	0
626	MDNR	2	1	0	0	0	0	0
627	MUSF	1	0	0	0	0	0	0
629	MBGI	1	0	0	0	0	0	0
630	MMT1	1	0	0	0	0	0	0
631	MABE	2	0	0	0	0	0	0
632	MMSE	4	0	0	0	0	0	0
633	MTFE	1	0	0	0	0	0	0
999		0	0	0	1	0	0	0

# PV Study Report

San Luis Valley Substation Second 230 kV Source  
January 2004



**TRI-STATE**  
Generation and Transmission  
Association, Inc.

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E TUE, DEC 09 2003 12:05  
SAN LUIS VALLEY SECOND SOURCE STUDY \* 03SLV0000HS LINE SHUNT DATA  
EXISTING SYSTEM

X-----FROM-----X X-----TO-----X  
NAME BSKV BUS# NAME BSKV BUS# CKT LINE G,B (FROM) LINE G,B (TO) ST

• NONE \*

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E TUE, DEC 09 2003 12:05  
SAN LUIS VALLEY SECOND SOURCE STUDY \* 03SLV0000HS SWITCHED  
EXISTING SYSTEM SHUNT DATA  
NAME BSKV BUS# MOD VHI VLO SHUNT X-----X X-----X X-----X X-----X  
X---- REMOTE ----X VSC NAME  
ALMSA TM69.0 70026 1 1.0450 1.0150 12.60 2: 6.30

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E TUE, DEC 09 2003 12:05  
SAN LUIS VALLEY SECOND SOURCE STUDY \* 03SLV0000HS MULTI-SECTION  
EXISTING SYSTEM LINE DATA  
X----- MULTI-SECTION LINE GROUPING ----X X----- LINE SECTIONS -----X  
X----- FROM ----X X----- TO ----X ID X----- FROM ----X X----- TO ----X CKT

• NONE \*

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E TUE, DEC 09 2003 12:05  
SAN LUIS VALLEY SECOND SOURCE STUDY \* 03SLV0000HS DC LINE DATA  
EXISTING SYSTEM

• NONE \*

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E TUE, DEC 09 2003 12:05  
SAN LUIS VALLEY SECOND SOURCE STUDY \* 03SLV0000HS FACTS CONTROL  
EXISTING SYSTEM DEVICE DATA  
FD# X- SENDING BUS --X X- TERMINAL BUS -X MODE PDES QDES V SET SHNTMX BRDGMX  
VTMAX VTMIN VSRMAX ISRMAX LINE X OWNER VSREF SET1 SET2

\* NONE \*

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
SAN LUIS VALLEY SECOND SOURCE STUDY \* 03SLV0000HS  
EXISTING SYSTEM

TUE, DEC 09 2003 12:05  
TRANSFORMER Z  
CORRECTION DATA

IMPEDANCE CORRECTION TABLE 1 IS A FUNCTION OF TRANSFORMER TURNS RATIO  
ENTRY 1 2 3 4  
RA 0.8750 1.0000 1.0250 1.1750  
\*F 1.1200 1.0000 0.9790 0.8950

IMPEDANCE CORRECTION TABLE 2 IS A FUNCTION OF TRANSFORMER TURNS RATIO  
ENTRY 1 2 3  
RA 0.9000 1.0000 1.1000  
\*F 1.3000 1.0000 0.8300

IMPEDANCE CORRECTION TABLE 4 IS A FUNCTION OF TRANSFORMER PHASE SHIFT ANGLE  
ENTRY 1 2 3 4 5 6 7 8 9 10 11  
AN -45.0 -36.0 -27.0 -18.0 -9.0 0.0 9.0 18.0 27.0 36.0 45.0  
\*F 1.7430 1.4280 1.2670 1.1570 1.0740 1.0000 1.1380 1.3050 1.4980 1.7190 1.9720

IMPEDANCE CORRECTION TABLE 5 IS A FUNCTION OF TRANSFORMER PHASE SHIFT ANGLE  
ENTRY 1 2 3 4 5 6 7 8 9 10 11  
AN -45.0 -36.0 -27.0 -18.0 -9.0 0.0 9.0 18.0 27.0 36.0 45.0  
\*F 1.7250 1.4180 1.2600 1.1530 1.0730 1.0000 1.1350 1.3000 1.4890 1.7050 1.9520

IMPEDANCE CORRECTION TABLE 6 IS A FUNCTION OF TRANSFORMER PHASE SHIFT ANGLE  
ENTRY 1 2 3  
AN -45.0 0.0 45.0  
\*F 2.0730 1.0000 2.0730

IMPEDANCE CORRECTION TABLE 7 IS A FUNCTION OF TRANSFORMER PHASE SHIFT ANGLE  
ENTRY 1 2 3 4 5 6 7 8 9 10 11  
AN -58.3 -46.6 -35.0 -23.3 -11.6 0.0 11.7 23.3 35.0 46.6 58.3  
\*F 1.5420 1.3170 1.2110 1.1630 1.1130 1.0000 1.0200 1.0880 1.2000 1.3520 1.5390

IMPEDANCE CORRECTION TABLE 9 IS A FUNCTION OF TRANSFORMER PHASE SHIFT ANGLE  
ENTRY 1 2 3 4 5 6 7 8 9  
AN -40.0 -30.0 -20.0 -10.0 0.0 10.0 20.0 30.0 40.0  
\*F 1.4000 1.3000 1.2000 1.1000 1.0000 1.1000 1.2000 1.3000 1.4000

IMPEDANCE CORRECTION TABLE 10 IS A FUNCTION OF TRANSFORMER PHASE SHIFT ANGLE  
ENTRY 1 2 3 4 5 6 7 8 9  
AN -36.0 -27.0 -18.0 -9.0 0.0 9.0 18.0 27.0 36.0  
\*F 1.6400 1.3600 1.1600 1.0400 1.0000 1.0400 1.1600 1.3600 1.6400

IMPEDANCE CORRECTION TABLE 11 IS A FUNCTION OF TRANSFORMER PHASE SHIFT ANGLE  
ENTRY 1 2 3 4 5 6 7 8 9 10 11  
AN -34.0 -27.2 -20.4 -13.6 -6.8 0.0 6.8 13.6 20.4 27.2 34.0  
\*F 2.0110 1.6750 1.3930 1.1790 1.0450 1.0000 1.0450 1.1790 1.3930 1.6750 2.0110

IMPEDANCE CORRECTION TABLE 13 IS A FUNCTION OF TRANSFORMER PHASE SHIFT ANGLE  
ENTRY 1 2 3 4 5 6 7 8 9 10 11  
AN -40.0 -35.0 -30.0 -20.0 -10.0 0.0 10.0 20.0 30.0 35.0 40.0  
\*F 1.6100 1.5340 1.4580 1.3050 1.1530 1.0000 1.1530 1.3050 1.4580 1.5340 1.6100

# **PV Study Report**

San Luis Valley Substation Second 230 kV Source  
January 2004



**TRI-STATE**  
Generation and Transmission  
Association, Inc.

SAN LUIS VALLEY SECOND SOURCE STUDY * 03SLV0000HS						INTER-AREA TRANSFER DATA	
EXISTING SYSTEM							
X--FROM AREA-X	X---TO AREA--X	ID	PTRANS	PTOTAL	DESINT		
10 [NEW MEXI]	14 [ARIZONA ]	0	-623.2				
10 [NEW MEXI]	19 [WAPA L.C]	0	-41.8				
10 [NEW MEXI]	73 [WAPA R.M]	0	40.0	-625.0	-625.0		
14 [ARIZONA ]	10 [NEW MEXI]	0	623.2				
14 [ARIZONA ]	19 [WAPA L.C]	0	-1704.0				
14 [ARIZONA ]	21 [IMPERIAL]	0	251.6				
14 [ARIZONA ]	22 [SANDIEGO]	0	761.3				
14 [ARIZONA ]	22 [SANDIEGO]	1	-3.0				
14 [ARIZONA ]	24 [SOCALIF ]	0	1505.4				
14 [ARIZONA ]	26 [LADWP ]	0	1265.9				
14 [ARIZONA ]	65 [PACE ]	0	-140.0	2560.4	2560.4		
18 [NEVADA ]	19 [WAPA L.C]	0	-667.7				
18 [NEVADA ]	24 [SOCALIF ]	0	-68.4				
18 [NEVADA ]	26 [LADWP ]	0	-231.0				
18 [NEVADA ]	65 [PACE ]	0	0.0	-967.1	-967.1		
19 [WAPA L.C]	10 [NEW MEXI]	0	41.8				
19 [WAPA L.C]	14 [ARIZONA ]	0	1704.0				
19 [WAPA L.C]	18 [NEVADA ]	0	667.7				
19 [WAPA L.C]	24 [SOCALIF ]	0	348.1				
19 [WAPA L.C]	26 [LADWP ]	0	451.6				
19 [WAPA L.C]	65 [PACE ]	0	250.0				
19 [WAPA L.C]	73 [WAPA R.M]	0	-358.2	3105.0	3105.0		
20 [MEXICO-C]	22 [SANDIEGO]	0	0.0	0.0	0.0		
21 [IMPERIAL]	14 [ARIZONA ]	0	-251.6				
21 [IMPERIAL]	22 [SANDIEGO]	0	-110.3				
21 [IMPERIAL]	24 [SOCALIF ]	0	519.0	157.1	157.1		
22 [SANDIEGO]	14 [ARIZONA ]	0	-761.3				
22 [SANDIEGO]	14 [ARIZONA ]	1	3.0				
22 [SANDIEGO]	20 [MEXICO-C]	0	0.0				
22 [SANDIEGO]	21 [IMPERIAL]	0	110.3				
22 [SANDIEGO]	24 [SOCALIF ]	0	-1114.0	-1762.0	-1762.0		
24 [SOCALIF ]	14 [ARIZONA ]	0	-1505.4				
24 [SOCALIF ]	18 [NEVADA ]	0	68.4				
24 [SOCALIF ]	19 [WAPA L.C]	0	-348.1				
24 [SOCALIF ]	21 [IMPERIAL]	0	-519.0				
24 [SOCALIF ]	22 [SANDIEGO]	0	1114.0				
24 [SOCALIF ]	26 [LADWP ]	0	-2181.6				
24 [SOCALIF ]	30 [PG AND E]	0	-2800.0				
24 [SOCALIF ]	64 [SIERRA ]	0	-13.0	-6184.7	-6184.7		
26 [LADWP ]	14 [ARIZONA ]	0	-1265.9				
26 [LADWP ]	18 [NEVADA ]	0	231.0				
26 [LADWP ]	19 [WAPA L.C]	0	-451.6				
26 [LADWP ]	24 [SOCALIF ]	0	2181.6				
26 [LADWP ]	40 [NORTHWES]	0	-2879.0				
26 [LADWP ]	40 [NORTHWES]	1	-99.0				

# *PV Study Report*

*San Luis Valley Substation Second 230 kV Source  
January 2004*



**TRI-STATE**  
Generation and Transmission  
Association, Inc.

26 [LADWP ]	64 [SIERRA ]	0	0.0		
26 [LADWP ]	65 [PACE ]	0	-142.0	-2424.9	-2424.9
30 [PG AND E]	24 [SOCALIF ]	0	2800.0		
30 [PG AND E]	40 [NORTHWES]	0	-4460.0		
30 [PG AND E]	64 [SIERRA ]	0	0.0	-1660.0	-1660.0
40 [NORTHWES]	26 [LADWP ]	0	2879.0		
40 [NORTHWES]	26 [LADWP ]	1	99.0		
40 [NORTHWES]	30 [PG AND E]	0	4460.0		
40 [NORTHWES]	50 [B.C.HYDR]	0	-2300.0		
40 [NORTHWES]	60 [IDAHO ]	0	105.0		
40 [NORTHWES]	62 [MONTANA ]	0	-1146.0		
40 [NORTHWES]	64 [SIERRA ]	0	268.0	4365.0	4365.0
50 [B.C.HYDR]	40 [NORTHWES]	0	2300.0		
50 [B.C.HYDR]	52 [AQUILA ]	0	54.0		
50 [B.C.HYDR]	54 [ALBERTA ]	0	400.0	2754.0	2754.0
52 [AQUILA ]	50 [B.C.HYDR]	0	-54.0	-54.0	-54.0
54 [ALBERTA ]	50 [B.C.HYDR]	0	-400.0	-400.0	-400.0
60 [IDAHO ]	40 [NORTHWES]	0	-105.0		
60 [IDAHO ]	64 [SIERRA ]	0	155.0		
60 [IDAHO ]	65 [PACE ]	0	456.0	506.0	506.0
62 [MONTANA ]	40 [NORTHWES]	0	1146.0		
62 [MONTANA ]	63 [WAPA U.M]	0	-150.0		
62 [MONTANA ]	65 [PACE ]	0	204.0	1200.0	1200.0
63 [WAPA U.M]	62 [MONTANA ]	0	150.0		
63 [WAPA U.M]	73 [WAPA R.M]	0	-72.0	78.0	78.0
64 [SIERRA ]	24 [SOCALIF ]	0	13.0		
64 [SIERRA ]	26 [LADWP ]	0	0.0		
64 [SIERRA ]	30 [PG AND E]	0	0.0		
64 [SIERRA ]	40 [NORTHWES]	0	-268.0		
64 [SIERRA ]	60 [IDAHO ]	0	-155.0		
64 [SIERRA ]	65 [PACE ]	0	-110.0	-520.0	-520.0

# **PV Study Report**

San Luis Valley Substation Second 230 kV Source  
January 2004



**TRI-STATE**  
Generation and Transmission  
Association, Inc.

---

65	[PACE ]	14	[ARIZONA ]	0	140.0		
65	[PACE ]	18	[NEVADA ]	0	0.0		
65	[PACE ]	19	[WAPA L.C]	0	-250.0		
65	[PACE ]	26	[LADWP ]	0	142.0		
65	[PACE ]	60	[IDAHO ]	0	-456.0		
65	[PACE ]	62	[MONTANA ]	0	-204.0		
65	[PACE ]	64	[SIERRA ]	0	110.0		
65	[PACE ]	73	[WAPA R.M]	0	77.9	-440.1	-440.1
70	[PSCOLORA]	73	[WAPA R.M]	0	-1110.8	-1110.8	-1110.8
73	[WAPA R.M]	10	[NEW MEXI]	0	-40.0		
73	[WAPA R.M]	19	[WAPA L.C]	0	358.2		
73	[WAPA R.M]	63	[WAPA U.M]	0	72.0		
73	[WAPA R.M]	65	[PACE ]	0	-77.9		
73	[WAPA R.M]	70	[PSCOLORA]	0	1110.8	1423.1	1423.1

# PV Study Report

San Luis Valley Substation Second 230 kV Source  
January 2004



**TRI-STATE**  
Generation and Transmission  
Association, Inc.

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E TUE, DEC 09 2003 12:05  
SAN LUIS VALLEY SECOND SOURCE STUDY \* 03SLV0000HS GENERATING  
EXISTING SYSTEM PLANT DATA  
NAME BSKV BUS# COD MCNS PGEN QGEN QMAX QMIN VSCHED VACT. PCT Q X---- REMOTE ----X  
ALMSACT113.8 70485 -2 1 0.0 0.0 0.0 0.0 1.0400 0.9789 100.0  
ALMSACT213.8 70486 -2 1 0.0 0.0 0.0 0.0 1.0490 0.9964 100.0

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E TUE, DEC 09 2003 12:05  
SAN LUIS VALLEY SECOND SOURCE STUDY \* 03SLV0000HS GENERATOR  
EXISTING SYSTEM UNIT DATA  
NAME BSKV BUS# CD ID ST PGEN QGEN QMAX QMIN PMAX PMIN OWN FRACT MBASE ZSORCE XTRAN GENTAP  
ALMSACT113.8 70485 -2 1 0 0.0 11.1 12.0 0.0 17.0 5.0 65 1.00 29.6 0.0000 0.2000  
ALMSACT213.8 70486 -2 1 0 0.0 10.4 14.0 0.0 19.0 5.0 65 1.00 29.6 0.0000 0.2000

# PV Study Report

San Luis Valley Substation Second 230 kV Source  
January 2004



**TRI-STATE**  
Generation and Transmission  
Association, Inc.

SAN LUIS VALLEY SECOND SOURCE STUDY * 03SLV0000HS														
BRANCH DATA														
NAME	BSKV	BUSH	NAME	ESKV	BUS#	CKT	LINE R	LINE X	CHRGING	ST RATE	RATE	LENGTH	OWN1	FRAC1
ALMSA ST69.0 70024	ALMSA	TM69.0	70025*	1	0.02282	0.02922	0.00054	1	43.7	43.7	43.7	0.0	1	1.000
ALMSA ST69.0 70024	ALMSA	TM69.0	70025*	1	0.48598	0.29219	0.00460	1	25.8	25.8	25.8	0.0	1	1.000
ALMSA ST69.0 70024	ALMSA	TM69.0	70025*	1	0.01503	0.01137	0.00018	1	29.6	29.6	29.6	0.0	1	1.000
ALMSA ST69.0 70024	ALMSA	TM69.0	70025*	1	0.21785	0.27892	0.00510	1	43.7	43.7	43.7	0.0	1	1.000
ALMSA ST69.0 70024	ALMSA	TM69.0	70025*	1	0.01200	0.01066	0.00019	1	33.8	33.8	33.8	0.0	1	1.000
ALMSA ST69.0 70024	ALMSA	TM69.0	70025*	1	0.03549	0.12512	0.01600	1	134.8	134.8	134.8	0.0	1	1.000
ANSEL TS69.0 70028*	ANSEL	TS69.0	70118	1	0.00645	0.01411	0.00030	1	64.8	64.8	64.8	0.0	1	1.000
ANSEL TS69.0 70028*	ANSEL	TS69.0	70118	1	0.03578	0.06638	0.00138	1	65.0	65.0	65.0	0.0	1	1.000
ANTONITO69.0 70029	ANTONITO	69.0	70367*	1	0.15964	0.14182	0.00247	1	33.8	33.8	33.8	8.9	1	1.000
CARMEL 69.0 70090	CARMEL	69.0	70468*	1	0.00911	0.03110	0.00054	1	71.9	71.9	71.9	0.0	1	1.000
CARMEL 69.0 70090	CARMEL	69.0	70477*	1	0.27054	0.25873	0.00388	1	30.0	30.0	30.0	0.0	1	1.000
CENTER 69.0 70092	CENTER	69.0	70230*	1	0.00813	0.01559	0.00026	1	50.0	50.0	50.0	0.0	1	1.000
CENTER 69.0 70092	CENTER	69.0	70245*	1	0.08126	0.15586	0.00272	1	50.0	50.0	50.0	0.0	1	1.000
COCENTER69.0 70118	COCENTER	69.0	70380*	1	0.00323	0.00706	0.00016	1	64.8	64.8	64.8	0.0	1	1.000
CREEDE 69.0 70129	CREEDE	69.0	70380*	1	0.23424	0.34547	0.00486	1	39.0	39.0	39.0	0.0	1	1.000
DELNORTE69.0 70143	DELNORTE	69.0	70360*	1	0.05787	0.13392	0.00254	1	64.8	64.8	64.8	0.0	1	1.000
FTGARLAND69.0 70187*	FTGARLAND	69.0	70187*	1	0.53031	0.40128	0.00629	1	29.6	29.6	29.6	0.0	1	1.000
HILANDSL69.0 70221	HILANDSL	69.0	70383*	1	0.05378	0.07421	0.00120	1	39.0	39.0	39.0	0.0	1	1.000
HOMELAKE69.0 70228	HOMELAKE	69.0	70361*	1	0.09058	0.11597	0.00212	1	43.7	43.7	43.7	0.0	1	1.000
HOOPER 69.0 70229	HOOPER	69.0	70230*	1	0.04063	0.07793	0.00136	1	50.0	50.0	50.0	0.0	1	1.000
HOOPER69.0 70509*	HOOPER	69.0	70376	1	0.05689	0.10910	0.00190	1	50.0	50.0	50.0	0.0	1	1.000
KERBERCK69.0 70509*	KERBERCK	69.0	70508	1	0.19598	0.11783	0.00486	1	25.8	25.8	25.8	0.0	65	1.000
LAGARITA69.0 70245	LAGARITA	69.0	70325*	1	0.22096	0.17377	0.00252	1	26.1	26.1	26.1	0.0	1	1.000
MEARSJCT69.0 70507*	MEARSJCT	69.0	70326	1	0.11704	0.07037	0.00112	1	25.8	25.8	25.8	0.0	65	1.000
MEARSJCT69.0 70507*	MEARSJCT	69.0	70508	1	0.32075	0.29046	0.00450	1	23.9	23.9	23.9	0.0	65	1.000
MIRGEJCT69.0 70505*	MIRGEJCT	69.0	70289	1	0.19187	0.11536	0.00182	1	25.8	25.8	25.8	0.0	65	1.000
MIRGEJCT69.0 70505*	MIRGEJCT	69.0	70506*	1	0.32536	0.19562	0.00308	1	25.8	25.8	25.8	0.0	65	1.000
MIRGEJCT69.0 70505*	MIRGEJCT	69.0	70508	1	0.32207	0.19363	0.00313	1	25.8	25.8	25.8	0.0	65	1.000
MOFFAT 69.0 70289*	MOFFAT	69.0	70292	1	0.58356	0.35086	0.00554	1	26.1	26.1	26.1	0.0	65	1.000
MOSCA 69.0 70292	MOSCA	69.0	70376*	1	0.11044	0.10001	0.00154	1	23.9	23.9	23.9	0.0	1	1.000
OLD16TAP69.0 70186*	OLD16TAP	69.0	70511	1	0.02885	0.02563	0.00045	1	33.8	33.8	33.8	1.6	1	1.000
OLD40TAP69.0 70511	OLD40TAP	69.0	70511	1	0.25316	0.22490	0.00392	1	108.0	108.0	108.0	0.0	1	1.000
PONCHA 115 70327*	PONCHA	115	70379*	1	0.15384	0.39388	0.04774	1	33.8	33.8	33.8	14.1	1	1.000
PONCHA 115 70327*	PONCHA	115	70394	1	0.00559	0.01970	0.00248	1	134.8	134.8	134.8	0.0	1	1.000
PONCHA 115 70327*	PONCHA	115	70394	1	0.00960	0.07570	0.27060	1	615.1	615.1	615.1	0.0	1	1.000
RANON 69.0 70348	RANON	69.0	70383*	1	0.00911	0.03190	0.00054	1	71.9	71.9	71.9	0.0	1	1.000
RANON 69.0 70348	RANON	69.0	70383*	2	0.00911	0.03190	0.00054	1	71.9	71.9	71.9	0.0	1	1.000
REAPAT 69.0 70552*	REAPAT	69.0	70367*	1	0.24366	0.21647	0.00377	1	134.8	134.8	134.8	0.0	1	1.000
RIORAND69.0 70360	RIORAND	69.0	70361*	1	0.09981	0.09341	0.00144	1	33.8	33.8	33.8	13.6	1	1.000
RIORAND69.0 70361	RIORAND	69.0	70380*	1	0.01840	0.02356	0.00044	1	43.7	43.7	43.7	0.0	1	1.000
S.ACATIO69.0 70373	S.ACATIO	69.0	70414*	1	0.12073	0.41203	0.00722	1	71.9	71.9	71.9	0.0	1	1.000
SAN LUIS 115 70374*	SAN LUIS	115	70379	1	0.00987	0.03480	0.00446	1	134.8	134.8	134.8	0.0	1	1.000
SAN LUIS 115 70374*	SAN LUIS	115	70411*	1	0.00630	0.02370	0.00292	1	134.8	134.8	134.8	0.0	1	1.000
SAN LUIS 115 70374*	SAN LUIS	115	70467*	1	0.02680	0.10430	0.01574	1	134.8	134.8	134.8	0.0	1	1.000
SAN LUIS 230 70375*	SAN LUIS	230	70459	1	0.01103	0.10105	0.20852	1	416.7	416.7	416.7	0.0	1	1.000
SMEITER 115 70394*	SMEITER	115	70550	1	0.07670	0.26990	0.03460	1	135.0	135.0	135.0	0.0	66	1.000
STOCKADE69.0 70414	STOCKADE	69.0	70468*	1	0.05239	0.17880	0.00314	1	71.9	71.9	71.9	0.0	1	1.000

# PV Study Report

San Luis Valley Substation Second 230 kV Source  
January 2004



**TRI-STATE**  
Generation and Transmission  
Association, Inc

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
SAN LUIS VALLEY SECOND SOURCE STUDY \* 03SLV0000HS  
EXISTING SYSTEM

TUE, DEC 09 2003 12:05  
2 WINDING XFRMER  
IMPEDANCE DATA

AIR FORCE DATA																										
X-----X X-----X X-----X X-----X X-----X X-----X											X-----X X-----X X-----X X-----X X-----X X-----X															
NAME		BSKV	BUS#	NAME	BSKV	BUS#	XFRMER		C	C	M	R	1-2	X	1-2	WBASE	MAG1	MAG2	RATA	RATB	RATC	TBL	NOM (R,X)	OWN	%	
ALMSA	TM69.0	70026	ALMSA	TM	115	70025	1	ALMSA	TM	2	1	0.02354	0.54773	100.0	0.0000	0.0000	0.0000	0.0000	25	25	25	0		1	1.0	
ALMSA	TM69.0	70026	ALMSA	TM	113.8	70485	1	ALMSA	TM	2	1	0.02300	0.44529	100.0	0.0000	-0.0022	24	24	24	24	24	24	0		65	1.0
ALMSA	TM	115	70025	ALMSA	TM	113.8	70486	1	ALMSA	TM	2	1	0.02590	0.41715	100.0	0.0000	-0.0022	24	24	24	24	24	0		65	1.0
PONCHA	69.0	70326	PONCHA		115	70327	1	PONCHA		2	1	0.04274	0.85693	100.0	0.0000	0.0000	13	13	13	13	13	13	0		65	1.0
RAMON	69.0	70348	RAMON		115	70347	1	RAMON		2	1	0.01090	0.21850	100.0	0.0000	0.0000	37	37	37	37	37	37	0		1	1.0
SAN LUIS	69.0	70376	SAN LUIS		115	70374	1	SAN LUIS		2	1	0.00950	0.19980	100.0	0.0000	0.0000	42	42	42	42	42	42	0		1	1.0
SAN LUIS	69.0	70376	SAN LUIS		115	70374	2	SAN LUIS		2	1	0.00950	0.19980	100.0	0.0000	0.0000	42	42	42	42	42	42	0		1	1.0
SAN LUIS	115	70374	SAN LUIS		230	70375	1	SAN LUIS		2	1	0.00051	0.04459	100.0	0.0010	-0.0045	142	142	142	142	142	142	0		1	1.0
SAN LUIS	115	70374	SAN LUIS		230	70375	2	SAN LUIS		2	1	0.00051	0.04459	100.0	0.0010	-0.0045	142	142	142	142	142	142	0		1	1.0
SARGENT	69.0	70380	SARGENT		115	70379	1	SARGENT		2	1	0.00631	0.13319	100.0	0.0000	0.0000	63	63	63	63	63	63	0		1	1.0
WAVERLY	69.0	70468	WAVERLY		115	70467	1	WAVERLY		2	1	0.01090	0.22900	100.0	0.0000	0.0000	37	37	37	37	37	37	0		1	1.0

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
SAN LUIS VALLEY SECOND SOURCE STUDY \* 03SLV0000HS  
EXISTING SYSTEM

TUE, DEC 09 2003 12:05  
2 WINDING XFRMER  
TAP & CONTROL DATA

X-----X X-----X									
---	--	--	--	--	--	--	--	--	--

PV Study Report  
San Luis Valley Substation Second 230 kV Source  
January 2004



PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
SAN LUIS VALLEY SECOND SOURCE STUDY \* 03SLV0000HS  
EXISTING SYSTEM  
XFRMER X--WINDING 1 BUS-X X--WINDING 2 BUS-X X--WINDING 3 BUS-X  
NAME NAME BSKV BUS# NAME BSKV BUS# NAME BSKV BUS# NAME BSKV BUS# NAME BSKV BUS# NAME BSKV BUS#  
TUE, DEC 09 2003 12:05  
3 WINDING XFRMER  
IMPEDANCE DATA  
S C  
X 1-2 X 1-2 X 2-3 X 2-3 X 3-1 X 3-1  
OWNR PRCT

\* NONE \*

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
SAN LUIS VALLEY SECOND SOURCE STUDY \* 03SLV0000HS  
EXISTING SYSTEM  
XFRMER X--WINDING BUS--X S C C C  
BUS  
NAME NAME BSKV BUS# T W Z M R WINDG X WINDG WBASE WIND V NOM V ANGLE RATA RATB RATC MAG1 MAG2 VOLT ANG TBL NOM (R,X)  
TUE, DEC 09 2003 12:05  
3 WINDING XFRMER  
WINDING DATA  
STAR POINT

\* NONE \*

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS/E  
SAN LUIS VALLEY SECOND SOURCE STUDY \* 03SLV0000HS  
EXISTING SYSTEM  
XFRMER X--WINDING 1 BUS-X C C  
IMPEDANCES -----X  
NAME NAME BSKV BUS# W Z CN RMAX RMIN VMAX VMIN NTPS NAME BSKV BUS# CR CX TBL R 1-2 X 1-2 R 3-1 X 3-1  
TUE, DEC 09 2003 12:05  
3 WINDING XFRMER  
CONTROL DATA  
X--CONTROLLED BUS X  
X----- NOMINAL

\* NONE \*

**PV Study Report**

San Luis Valley Substation Second 230 kV Source  
January 2004



**TRI-STATE**  
Generation and Transmission  
Association, Inc.

Case	Project	Length (Miles)	R (p.u.)	X (p.u.)	B (p.u.)
90	Monarch - San Luis Valley	70.0	0.01103	0.10105	0.20853
25	San Luis Valley - Walsenburg	75.0	0.01182	0.10827	0.22343
85	Parlin - San Luis Valley	75.0	0.01182	0.10827	0.22343
05	Cotopaxi - San Luis Valley	75.0	0.01182	0.10827	0.22343
20	Comanche - San Luis Valley	95.0	0.01497	0.13714	0.28301
15	Penrose - San Luis Valley	95.0	0.01497	0.13714	0.28301
35	San Luis Valley - Taos	100.0	0.01576	0.14436	0.29790
10	Midway - San Luis Valley	110.0	0.01733	0.15879	0.32769
95	San Luis - Sargent	6.0	0.00095	0.00866	0.01787
95	Poncha - Sargent	65.0	0.01024	0.09383	0.19364
80	Curecanti - San Luis Valley	110.0	0.01733	0.15879	0.32769
70	Cerro - San Luis Valley	120.0	0.01891	0.17323	0.35748
40	Llaves - San Luis Valley	125.0	0.01970	0.18045	0.37238
50	Hesperus - San Luis Valley	130.0	0.02048	0.18766	0.38727
75	Montrose - San Luis Valley	135.0	0.02127	0.19488	0.40217
65	Lone Cone - San Luis Valley	150.0	0.02364	0.21654	0.44685
60	San Luis Valley - Stoner	150.0	0.02364	0.21654	0.44685
55	Lost Canyon - San Luis Valley	155.0	0.02442	0.22375	0.46175
45	San Juan - San Luis Valley	170.0	0.02679	0.24541	0.50643
30	Gladstone - San Luis Valley	180.0	0.02836	0.25984	0.53622

345/230 kV transformers were modeled with the following parameters:

R = 0.00020

X = 0.01360

B = 0

Rating = 500 MVA

230/115 kV transformers were modeled with the following parameters:

R = 0.00051

X = 0.04459

B = 0.00100

Rating = 142 MVA

***PV Study Report***  
*San Luis Valley Substation Second 230 kV Source*  
*January 2004*



---

03PvReport03.doc



**TSGT 000848**