

2013/2014 ISO Reliability Assessment - Preliminary Study Results

Study Area: **PG&E Greater Bay Area San Jose - Summer Peak**



Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	
SanJ-SP-T-01	Piercy-Metcalf 115 kV Line	B2_12_Newark-Dixon Landing 115 kV Line	B	N-1	110%	<100%	<100%	Action Plan before Mabury Voltage Conversion Project is completed
SanJ-SP-T-02	Monta Vista-Los Gatos 60 kV Line	Evergreen 115/60 kV Transformer No. 1	B	T-1	109%	<100%	<100%	Action Plan before Monta Vista-Los Gatos-Evergreen 60kV Line Reconductor Project is completed
SanJ-SP-T-03	Monta Vista-Los Gatos 60 kV Line	Evergreen-Almaden 60 kV Line	B	N-1	109%	<100%	<100%	Action Plan before Monta Vista-Los Gatos-Evergreen 60kV Line Reconductor Project is completed
SanJ-SP-T-04	NRS-SRS 115 kV Line	Los Esteros-Nortech 115 kV Line	B	N-1	101%	<100%	<100%	Action Plan before NRS-Scout #1 115kV Line Reconductor Project is completed
SanJ-SP-T-05	Metcalf-Llagas 115 kV Line(MTCALF D-MORGN J1)	C127b_BUS FAULT AT 35648 LLAGAS F 115.00	C1	Bus	103%	100%	<100%	Drop load either manually or thru SPS as appropriate
SanJ-SP-T-06	Metcalf-Llagas 115 kV Line (LLAGAS-MORGN J2)	C127b_BUS FAULT AT 35648 LLAGAS F 115.00	C1	Bus	111%	108%	105%	Re-rate or reconductor line. Drop load either manually or thru SPS as appropriate
SanJ-SP-T-07	Metcalf-Llagas 115 kV Line (MORGN J1-MORGN J2)	C127b_BUS FAULT AT 35648 LLAGAS F 115.00	C1	Bus	103%	100%	<100%	Drop load either manually or thru SPS as appropriate
SanJ-SP-T-08	Metcalf 230/115 kV Trans No. 1	C2-2_CB FAULT AT METCALF SUB 230 CB322	C2	Breaker	114%	113%	116%	Re-rate or reconductor line. Drop load either manually or thru SPS as appropriate

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					2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	
SanJ-SP-T-09	Metcalfe 230/115 kV Trans No. 4	C2-1_CB FAULT AT METCALF SUB 230 CB312	C2	Breaker	104%	105%	106%	Re-rate or reconductor line. Drop load either manually or thru SPS as appropriate
SanJ-SP-T-10	Metcalfe 230/115 kV Trans No. 2	C2-1_CB FAULT AT METCALF SUB 230 CB312	C2	Breaker	103%	105%	106%	Re-rate or reconductor line. Drop load either manually or thru SPS as appropriate
SanJ-SP-T-11	Metcalfe 230/115 kV Trans No. 3	C2-2_CB FAULT AT METCALF SUB 230 CB322	C2	Breaker	113%	114%	115%	Re-rate or reconductor line. Drop load either manually or thru SPS as appropriate
SanJ-SP-T-12	Trimble-San Jose 'B' 115 kV Line	B2_20_El Patio-San Jose Sta. 'A' 115 kV Line & B2_22_Kifer-FMC 115 kV Line	C3	N-1-1	<100%	109%	105%	Re-rate or reconductor line. Drop load either manually or thru SPS as appropriate
SanJ-SP-T-13	Swift-Metcalfe 115 kV Line	B2_15_Newark-Milpitas 115 kV Line No. 1 & B2_16_Newark-Milpitas 115 kV Line No. 2	C3	N-1-1	102%	<100%	<100%	Drop load either manually or thru SPS as appropriate
SanJ-SP-T-14	Evergreen-Mabury 115 kV Line(MABURY J-MABURY)	B2_12_Newark-Dixon Landing 115 kV Line & B2_40_Piercy-Metcalfe 115 kV Line	C3	N-1-1	<100%	123%	124%	Re-rate or reconductor line. Drop load either manually or thru SPS as appropriate
SanJ-SP-T-15	Evergreen-Mabury 115 kV Line(MABURY-JENING J)	B2_12_Newark-Dixon Landing 115 kV Line & B2_40_Piercy-Metcalfe 115 kV Line	C3	N-1-1	<100%	142%	143%	Re-rate or reconductor line. Drop load either manually or thru SPS as appropriate
SanJ-SP-T-16	Evergreen-Mabury 115 kV Line(EVRGRN 2-JENING J)	B2_12_Newark-Dixon Landing 115 kV Line & B2_40_Piercy-Metcalfe 115 kV Line	C3	N-1-1	<100%	143%	144%	Re-rate or reconductor line. Drop load either manually or thru SPS as appropriate
SanJ-SP-T-17	Metcalfe 230/115 kV Trans No. 1	B3_7_Metcalfe 230/115 kV Trans No. 4 & B3_8_Metcalfe 230/115 kV Trans No. 2	C3	N-1-1	104%	105%	106%	Re-rate or reconductor line. Drop load either manually or thru SPS as appropriate

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ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	
SanJ-SP-T-18	Metcalf 230/115 kV Trans No. 4	B3_6_Metcalf 230/115 kV Trans No. 1 & B3_8_Metcalf 230/115 kV Trans No. 2	C3	N-1-1	104%	105%	106%	Re-rate or reconductor line. Drop load either manually or thru SPS as appropriate
SanJ-SP-T-19	Metcalf-Morgan Hill 115 kV Line	B2_36_Metcalf-Llagas 115 kV Line & B2_39_Llagas-Gilroy Foods 115 kV Line	C3	N-1-1	103%	107%	110%	Re-rate or reconductor line. Drop load either manually or thru SPS as appropriate
SanJ-SP-T-20	Metcalf-Llagas 115 kV Line	B2_39_Llagas-Gilroy Foods 115 kV Line & B2_35_Metcalf-Morgan Hill 115 kV Line	C3	N-1-1	112%	116%	120%	Re-rate or reconductor line. Drop load either manually or thru SPS as appropriate
SanJ-SP-T-21	Metcalf 230/115 kV Trans No. 2	B3_9_Metcalf 230/115 kV Trans No. 3 & B3_7_Metcalf 230/115 kV Trans No. 4	C3	N-1-1	105%	106%	107%	Re-rate or reconductor line. Drop load either manually or thru SPS as appropriate
SanJ-SP-T-22	Metcalf 230/115 kV Trans No. 3	B3_8_Metcalf 230/115 kV Trans No. 2 & B3_7_Metcalf 230/115 kV Trans No. 4	C3	N-1-1	103%	104%	105%	Re-rate or reconductor line. Drop load either manually or thru SPS as appropriate
SanJ-SP-T-23	Metcalf-Evergreen No. 2 115 kV Line	B2_20_El Patio-San Jose Sta. 'A' 115 kV Line & B2_31_Metcalf-Evergreen No. 1 115 kV Line	C3	N-1-1	113%	<100%	<100%	Action Plan before Metcalf-Evergreen Line 1 & 2, 115kV Lines Reconductor Project is completed
SanJ-SP-T-24	Metcalf-Llagas 115 kV Line	B2_35_Metcalf-Morgan Hill 115 kV Line & B2_39_Llagas-Gilroy Foods 115 kV Line	C3	N-1-1	121%	126%	130%	Re-rate or reconductor line. Drop load either manually or thru SPS as appropriate
SanJ-SP-T-25	Metcalf-Llagas 115 kV Line	B2_35_Metcalf-Morgan Hill 115 kV Line & B2_39_Llagas-Gilroy Foods 115 kV Line	C3	N-1-1	112%	116%	120%	Re-rate or reconductor line. Drop load either manually or thru SPS as appropriate

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Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	
SanJ-SP-T-26	Los Esteros-Trimble 115 kV Line	B2_43_Los Esteros-Montague 115 kV Line & B2_45_Los Esteros-Nortech 115 kV Line	C3	N-1-1	<100%	104%	104%	Re-rate or reconductor line. Drop load either manually or thru SPS as appropriate
SanJ-SP-T-27	Trimble-San Jose 'B' 115 kV Line	C5_16_Metcalf - El Patio No. 1 & 2 115 kV Lines	C5	DCTL	<100%	116%	114%	Re-rate or reconductor line. Drop load either manually or thru SPS as appropriate
SanJ-SP-T-28	Piercy-Metcalf 115 kV Line	C5_2_Newark - Dixon Landing & Newark - Milpitas #1 115 kV Lines	C5	DCTL	110%	<100%	<100%	Action Plan before Mabury Voltage Conversion Project is completed

San Onofre Nuclear Generation Station was retired on June 7, 2013 and therefore was removed from the base cases used for the 2013/14 ISO transmission planning process.

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Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	
SanJ-SP-VD-1	ALMADEN 60kV	B2_48_Evergreen-Almaden 60 kV Line	B	N-1	-14.00%	-12.00%	-12.00%	Add Reactive Support
SanJ-SP-VD-2	DIXON LD 60kV	B2_12_Newark-Dixon Landing 115 kV Line	B	N-1	-6.00%	< 5%	< 5%	Action Plan before the Marbury Voltage Conversion Project is completed
SanJ-SP-VD-3	MABURY 115kV	B2_40_Piercy-Metcalf 115 kV Line	B	N-1	-5.00%	< 5%	< 5%	Action Plan before the Marbury Voltage Conversion Project is completed
SanJ-SP-VD-4	MABURY J 115kV	B2_40_Piercy-Metcalf 115 kV Line	B	N-1	-5.00%	< 5%	< 5%	Action Plan before the Marbury Voltage Conversion Project is completed
SanJ-SP-VD-5	MCKEE 115kV	B2_40_Piercy-Metcalf 115 kV Line	B	N-1	-5.00%	< 5%	< 5%	Action Plan before the Marbury Voltage Conversion Project is completed
SanJ-SP-VD-6	PIERCY 115kV	B2_40_Piercy-Metcalf 115 kV Line	B	N-1	-8.00%	-5.00%	-5.00%	Add Reactive Support
SanJ-SP-VD-7	SWIFT 115kV	B2_28_Swift-Metcalf 115 kV Line	B	N-1	< 5%	-5.00%	-5.00%	Add Reactive Support
SanJ-SP-VD-8	ALMADEN 60kV	B2_7_Los Esteros-Metcalf 230 kV Line & B2_48_Evergreen-Almaden 60 kV Line	C3	N-1-1	-14.00%	<10%	<10%	Action Plan before the Almaden Voltage Support Project is completed
SanJ-SP-VD-9	LLAGAS 115kV	B2_35_Metcalf-Morgan Hill 115 kV Line & B2_39_Llagas-Gilroy Foods 115 kV Line	C3	N-1-1	<10%	<10%	-10.00%	Add Reactive Support
SanJ-SP-VD-10	MRGN HIL 115kV	B2_35_Metcalf-Morgan Hill 115 kV Line & B2_39_Llagas-Gilroy Foods 115 kV Line	C3	N-1-1	-11.00%	-12.00%	-12.00%	Add Reactive Support
SanJ-SP-VD-11	PIERCY 115kV	B2_12_Newark-Dixon Landing 115 kV Line & B2_40_Piercy-Metcalf 115 kV Line	C3	N-1-1	<10%	-10.00%	-10.00%	Add Reactive Support

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Study Area: **PG&E Greater Bay Area San Jose - Summer Off-Peak & Summer Light Load**



Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2015 Summer Off-Peak	2018 Summer Light Load	N/A	
SanJ-OP-DV-01	ALMADEN 60kV	B2_48_Evergreen-Almaden 60 kV Line	B	N-1	-8.00%	< 5%	-	Action Plan before Monta Vista-Los Gatos-Evergreen 60kV Line Reconductor Project is Completed

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Study Area: **PG&E Greater Bay Area San Jose - Summer Peak**

High/Low Voltage



ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	
SanJ-SP-V-01	ALMADEN 60kV	B2_48_Evergreen-Almaden 60 kV Line	B	N-1	0.89	> 0.95	> 0.95	Action Plan before Monta Vista-Los Gatos-Evergreen 60kV Line Reconductor Project is Completed
SanJ-SP-V-02	MRGN HIL 115kV	B2_35_Metcalf-Morgan Hill 115 kV Line & B2_39_Llagas-Gilroy Foods 115 kV Line	C3	N-1-1	0.89	0.89	0.89	Action Plan before Monta Vista-Los Gatos-Evergreen 60kV Line Reconductor Project is Completed

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Study Area: **PG&E Greater Bay Area San Jose - Summer Off-Peak & Summer Light Load**

High/Low Voltage



ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2015 Summer Off-Peak	2018 Summer Light Load	N/A	
SanJ-OP-V-01	ALMADEN 60kV	B2_24_Markham No. 1 115 kV Tap	B	N-1	1.12	1.17	-	Under review for possible exemption or reactive device
SanJ-OP-V-02	EVGRN&1 115kV	B2_1_Newark-Los Esteros 230 kV Line	B	N-1	> 0.95	1.10	-	Under review for possible exemption or reactive device
SanJ-OP-V-03	MORGN J1 115kV	B2_39_Llagas-Gilroy Foods 115 kV Line	B	N-1	> 0.95	1.10	-	Under review for possible exemption or reactive device
SanJ-OP-V-04	ALMADEN 60kV	C112_BUS FAULT AT 35619 SJB EF 115.00	C1	Bus	1.13	1.17	-	Under review for possible exemption or reactive device
SanJ-OP-V-05	EVGRN J 115kV	C118_BUS FAULT AT 35633 EVGRN 2 115.00	C1	Bus	> 0.9	1.10	-	Under review for possible exemption or reactive device
SanJ-OP-V-06	MORGN J1 115kV	C127a_BUS FAULT AT 35648 LLAGAS E 115.00	C1	Bus	> 0.9	1.10	-	Under review for possible exemption or reactive device
SanJ-OP-V-07	STONE &1 115kV	C118_BUS FAULT AT 35633 EVGRN 2 115.00	C1	Bus	> 0.9	1.10	-	Under review for possible exemption or reactive device
SanJ-OP-V-08	ALMADEN 60kV	C2-5_CB FAULT AT SAN JOSE B SUB 115 CB162	C2	Breaker	1.13	1.18	-	Under review for possible exemption or reactive device
SanJ-OP-V-09	MRGN HIL 115kV	C2-9_CB FAULT AT LLAGAS SUB 115 CB166	C2	Breaker	> 0.9	1.10	-	Under review for possible exemption or reactive device
SanJ-OP-V-10	PIERCY 115kV	C5_5_McKee - Piercy & Milpitas - Swift 115 kV Lines	C5	DCTL	> 0.9	1.10	-	Under review for possible exemption or reactive device
SanJ-OP-V-11	ALMADEN 60kV	C5_26_Evergreen - San Jose B & Evergreen - Mabury 115 kV	C5	DCTL	1.13	1.18	-	Under review for possible exemption or reactive device
SanJ-OP-V-12	EVGRN J 60kV	C5_11_Trimble - San Jose B & FMC - San Jose B 115 kV Lines	C5	DCTL	1.13	> 0.9	-	Under review for possible exemption or reactive device
SanJ-OP-V-13	EVGRN&1 115kV	C5_20_Newark - Los Esteros & Los Esteros - Metcalf 230 kV Lines	C5	DCTL	> 0.9	1.10	-	Under review for possible exemption or reactive device
SanJ-OP-V-14	IBM-HR J 115kV	C5_11_Trimble - San Jose B & FMC - San Jose B 115 kV Lines	C5	DCTL	> 0.9	1.10	-	Under review for possible exemption or reactive device
SanJ-OP-V-15	JENNINGS 60kV	C5_11_Trimble - San Jose B & FMC - San Jose B 115 kV Lines	C5	DCTL	1.13	> 0.9	-	Under review for possible exemption or reactive device

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Study Area: **PG&E Greater Bay Area San Jose - Summer Off-Peak & Summer Light Load**



High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2015 Summer Off-Peak	2018 Summer Light Load	N/A	
SanJ-OP-V-16	MRGN HIL 115kV	C5_19_Morgan Hill - Llagas & Metcalf - Llagas 115 kV Lines	C5	DCTL	> 0.9	1.10	-	Under review for possible exemption or reactive device
SanJ-OP-V-17	SETER J 60kV	C5_26_Evergreen - San Jose B & Evergreen - Mabury 115 kV	C5	DCTL	1.13	1.18	-	Under review for possible exemption or reactive device

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Single Contingency Load Drop

ID	Worst Contingency	Category	Category Description	Amount of Load Drop (MW)			Potential Mitigation Solutions
				Select..	Select..	Select..	

No single contingency resulted in total load drop of more than 250 MW.

Study Area: **PG&E Greater Bay Area San Jose - Summer Off-Peak & Summer Light Load**



Single Contingency Load Drop

ID	Worst Contingency	Category	Category Description	Amount of Load Drop (MW)			Potential Mitigation Solutions
				Select..	Select..	Select..	

No single contingency resulted in total load drop of more than 250 MW.

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Single Source Substation with more than 100 MW Load

ID	Substation	Load Served (MW)			Potential Mitigation Solutions
		Select..	Select..	Select..	

No single source substation with more than 100 MW Load

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Study Area: **PG&E Greater Bay Area San Jose - Summer Off-Peak & Summer Light Load**



Single Source Substation with more than 100 MW Load

ID	Substation	Load Served (MW)			Potential Mitigation Solutions
		Select..	Select..	Select..	

No single source substation with more than 100 MW Load