

2012/2013 ISO Reliability Assessment - Preliminary Study Results

Study Area: **PG&E Central Valley Stockton - Summer Peak**

Thermal Overloads



ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014	2017	2022	
Stoc-T-1	Weber - Mormon Jct 60 kV Line	Normal	A	N-0	89%	93%	103%	Rerate
Stoc-T-2	Kasson - Louise 60 kV Line	BUS FAULT AT 33528 KASSON 115.00	C1	Bus	113%	117%	124%	Upgrade Kasson 115 kV bus.
Stoc-T-3	Manteca - Louise 60 kV Line	BUS FAULT AT 33528 KASSON 115.00	C1	Bus	151%	155%	163%	Upgrade Kasson 115 kV bus.
Stoc-T-4	Manteca 115/60 kV Transformer No. 3	BUS FAULT AT 33528 KASSON 115.00	C1	Bus	191%	198%	209%	Upgrade Kasson 115 kV bus.
Stoc-T-5	Tesla - Weber 230 kV Line	BUS FAULT AT 30624 TESLA E Bus 2 230.00	C1	Bus	84%	93%	106%	Replace limiting component.
Stoc-T-6	Tesla - Weber 230 kV Line	TESLA E 230 kV Bus 2 and TESLA D 230 kV Bus 2 - CB 822 Failure	C2	Stuck Bkr	85%	94%	107%	Replace limiting component.
Stoc-T-7	Bellota-Riverbank-Melones 115 kV Line	BELLOTA 230 kV Bus 1 and Bus 2 - CB 200 Failure	C2	Stuck Bkr	94%	102%	114%	Add sectionalizing breaker at Bellota 230 kV bus
Stoc-T-8	Kasson - Louise 60 kV Line	Schulte - Kasson - Manteca 115 kV Line_Manteca - Vierra 115 kV Line	C3	N-1-1	80%	87%	101%	Rerate.
Stoc-T-9	Lockeford - Industrial 60 kV Line	Lockeford - Lodi 60 kV Line No. 2 _Lodi - Industrial 60 kV Line	C3	N-1-1	140%	145%	150%	Lodi area reinforcement.
Stoc-T-10	Lockeford - Lodi 60 kV Line No. 1	Lockeford - Lodi 60 kV Line No. 2 _Lockeford - Industrial 60 kV Line	C3	N-1-1	136%	142%	147%	Lodi area reinforcement.
Stoc-T-11	Lockeford - Lodi 60 kV Line No. 2	Lockeford - Industrial 60 kV Line _Lodi - Industrial 60 kV Line	C3	N-1-1	157%	163%	168%	Lodi area reinforcement.
Stoc-T-12	Lockeford - Lodi 60 kV Line No. 3	Lockeford - Lodi 60 kV Line No. 2 _Lockeford - Industrial 60 kV Line	C3	N-1-1	168%	175%	182%	Lodi area reinforcement.
Stoc-T-13	Lockeford No. 1 60 kV Line	Lockeford - Bellota 230 kV Line _Hammer - Country Club 60 kV	C3	N-1-1	199%	195%	255%	Short term: Disable automatics. Long term: Lodi area reinforcement.
Stoc-T-14	Lodi - Industrial 60 kV Line	Lockeford - Lodi 60 kV Line No. 2 _Lockeford - Industrial 60 kV Line	C3	N-1-1	177%	184%	190%	Lodi area reinforcement.
Stoc-T-15	Stockton 'A' - Lockeford - Bellota 115 kV Line No. 2	Stockton 'A'-Lockeford-Bellota 115 kV _Gold Hill-Bellota-Lockeford 115 kV Line	C3	N-1-1	91%	96%	102%	Operating solution

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Stoc-T-16	Stockton 'A' - Weber 60 kV Line No. 3	Stockton 'A' - Weber 60 kV Line No. 1 _Stockton 'A' - Weber 60 kV Line No. 2	C3	N-1-1	124%	128%	14%	Interim operating solution
Stoc-T-17	Tesla - Weber 230 kV Line	Rio Oso - Lockeford 230 kV Line _Bellota - Tesla 230 kV Line No. 2	C3	N-1-1	82%	91%	104%	Replace limiting component.
Stoc-T-18	Kasson - Louise 60 kV Line	Schulte-Kasson-Manteca 115 kV Line & Manteca-Vierra 115 kV Line	C5	DCTL	80%	87%	101%	Rerate

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Study Area: **PG&E Central Valley Stockton - Summer Light Load & Summer Off-Peak**



Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Summer Off-Peak	N/A	
Stoc-OP-T-01	Bellota-Riverbank-Melones 115 kV Line	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	134%	14%		Interim operating solution.
Stoc-OP-T-02	Riverbank Jct - Manteca 115 kV Line	Stanislaus-Melones-Manteca 115 kV Line_Bellota-Riverbank-Melones 115 kV Line	C3	N-1-1	119%	105%		Reduce Melones area generation

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Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014	2017	2022	
Stoc-DV-01	STKTON B 115 kV	BELLOTA 230 kV Bus 1 and Bus 2 - CB 200 Failure	C2	Stuck Bkr	-6%	-8%	-12%	Add sectionalizing breaker at Bellota 230 kV bus
Stoc-DV-02	STKTON A 115 kV	BELLOTA 230 kV Bus 1 and Bus 2 - CB 200 Failure	C2	Stuck Bkr	-5%	-7%	-10%	Add sectionalizing breaker at Bellota 230 kV bus
Stoc-DV-03	LOCKFORD 115 kV	BELLOTA 230 kV Bus 1 and Bus 2 - CB 200 Failure	C2	Stuck Bkr	-6%	-8%	-12%	Add sectionalizing breaker at Bellota 230 kV bus
Stoc-DV-04	RVRBANK 115 kV	BELLOTA 230 kV Bus 1 and Bus 2 - CB 200 Failure	C2	Stuck Bkr	-6%	-8%	-11%	Add sectionalizing breaker at Bellota 230 kV bus

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Summer Off-Peak	N/A	

No voltage deviation issues identified.

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High/Low Voltage



ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014	2017	2022	
Stoc-V-01	DONNELLS 115 kV	Normal	A	N-0	1.06	1.06	1.05	Under review for possible exemption.
Stoc-V-02	BEARDSLY 115 kV	Normal	A	N-0	1.05	1.05	1.05	Under review for possible exemption.
Stoc-V-03	VICTOR 60 kV	Lockeford - Bellota 230 kV Line _Hammer - Country Club 60 kV	C3	N-1-1	0.84	0.89	0.77	Lodi area reinforcement.
Stoc-V-04	MONDAVI 60 kV	Lockeford - Bellota 230 kV Line _Hammer - Country Club 60 kV	C3	N-1-1	0.82	0.87	0.75	Lodi area reinforcement.
Stoc-V-05	LODI 60 kV	Lockeford - Bellota 230 kV Line _Hammer - Country Club 60 kV	C3	N-1-1	0.83	0.87	0.75	Lodi area reinforcement.
Stoc-V-06	COLONY 60 kV	Lockeford - Bellota 230 kV Line _Hammer - Country Club 60 kV	C3	N-1-1	0.84	0.89	0.76	Lodi area reinforcement.
Stoc-V-07	MSHR 60V 60 kV	Lockeford - Bellota 230 kV Line _Hammer - Country Club 60 kV	C3	N-1-1	0.78	0.83	0.68	Lodi area reinforcement.

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Study Area: **PG&E Central Valley Stockton - Summer Light Load & Summer Off-Peak**

High/Low Voltage



ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Summer Off-Peak	N/A	
Stoc-OP-V-01	HERDLYN 60 kV	Normal	A	N-0	1.07	1.04		Under review for possible exemption.
Stoc-OP-V-02	B.BTHNY- 60 kV	Normal	A	N-0	1.07	1.04		Under review for possible exemption.
Stoc-OP-V-03	HRDLNJCT 60 kV	Normal	A	N-0	1.07	1.04		Under review for possible exemption.
Stoc-OP-V-04	TOSCO-PP 60 kV	Normal	A	N-0	1.07	1.05		Under review for possible exemption.
Stoc-OP-V-05	SOUTH BY 60 kV	Normal	A	N-0	1.07	1.05		Under review for possible exemption.
Stoc-OP-V-06	WEST SDE 60 kV	Normal	A	N-0	1.07	1.04		Under review for possible exemption.
Stoc-OP-V-07	VICTOR 60 kV	Rio Oso - Lockeford 230 kV Line _Lockeford - Bellota 230 kV Line	C3	N-1-1	0.93	0.86		Lodi area reinforcement.
Stoc-OP-V-08	MONDAVI 60 kV	Rio Oso - Lockeford 230 kV Line _Lockeford - Bellota 230 kV Line	C3	N-1-1	0.92	0.85		Lodi area reinforcement.
Stoc-OP-V-09	LODI 60 kV	Rio Oso - Lockeford 230 kV Line _Lockeford - Bellota 230 kV Line	C3	N-1-1	0.92	0.85		Lodi area reinforcement.
Stoc-OP-V-10	COLONY 60 kV	Rio Oso - Lockeford 230 kV Line _Lockeford - Bellota 230 kV Line	C3	N-1-1	0.93	0.85		Lodi area reinforcement.

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Single Contingency Load Drop

ID	Worst Contingency	Category	Category Description	Amount of Load Drop (MW)			Potential Mitigation Solutions
				2014	2017	2022	

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
		2014	2017	2022	

No single source substation with more than 100 MW Load