2015-2016 ISO Reliability Assessment - Preliminary Study Results

Study Area: **SCE Metro**

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)								Potential Mitigation Solutions
					2017 Summer Peak	2020 Summer Peak	2025 Summer Peak	2017 Spring Off-Peak	2020 Spring Light Load	N/A	N/A	N/A	
METRO-T-1	VINCENT 500/230 KV #1	VINCENT 500/230 kV #4	P1	T-1	<100	<100	<100	108.05	<100				1) Dispatch generation in LA Basin 2) Replace Vincent #1 transformer to match the rating of the #4 transformer.
METRO-T-2	LUGO – VICTORVL 500 KV #1	LUGO – ELDORDO 500 KV #1	P1	L-1	<100	<100	99.80	<100	<100				Increase the rating of the line.
METRO-T-3		LUGO – ELDORDO 500 KV #1 & MOUNTAIN VIEW CC MODULE	P3	G-1/L-1	<100	<100	100.53	<100	<100				
METRO-T-4	LAGUBELL – MESA CAL 230 #1	MESA CAL – LITEHIPE 230.0 #1 & MESA CAL – REDONDO 230.0 #1	P6	L-1/L-1	<100	<100	107.66	<100	<100				Utilize Preferred Resources and Energy Storage.
METRO-T-5		MESA CAL – LITEHIPE 230.0 #1 & MESACALS – LAGUBELL 230.0 #2	P7	L-2	<100	<100	101.99	<100	<100				
METRO-T-6		MESA 500./230 KV #3 & #4	P6	T-1/T-1	<100	<100	104.66	<100	<100				
METRO-SP-T-7	LUGO – VICTORVL 500 KV #1	LUGO – ELDORDO 500 KV #1 & MOHAVE – ELDORDO 500 KV #1 OR MOHAVE – LUGO 500 KV #1	P6	L-1/L-1	113.98	111.50	127.47	<100	<100				Increase the rating of the line.
METRO-T-8	VINCENT 500/230 KV #1	VINCENT 500/230 KV #4 & VINCENT – MESA CAL 500 KV #1	P6	T-1/L-1	N/A	N/A	112.12	N/A	N/A				1) Replace Vincent #1 transformer to match the rating of the #4 transformer . 2) System adjustment after intial or second contingency including utilizimg Preferred Resources & Energy Storage.
METRO-T-9		VINCENT 500/230 kV #4 & SYLMAR1 – SYLMAR S 230 KV #1	P6	T-1/L-1	104.53	111.70	<100	113.53	116.38				
METRO-T-10	LCIENEGA – LA FRESA 230KV #1	EL NIDO – LA FRESA 230 KV #3 & #4	P7	L-2	<100	<100	<100	103.00	<100				Increase pre-contingency generation in the El Nido local area.
METRO-T-11	SERRANO 500/230 KV #1, #2, OR #3	TWO SERRANO 500/230 KV TRAN.	P6	T-1/T-1	100.97	108.46	117.37	125.03	<100				1) Install a hot spare transformer 2) System adjustments after intial or second contingency including dispatching generation and Preferred Resources & Storage.

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)								Potential Mitigation Solutions
					2017 Summer Peak	2020 Summer Peak	2025 Summer Peak	2017 Spring Off-Peak	2020 Spring Light Load	N/A	N/A	N/A	
METRO-T-12	MIRALOMA 500/230 KV #4	MIRALOMA – SERRANO 500 KV #2 & LUGO – RANCHVST 500 kV #1	P6	L-1/L-1	127.82	122.02	<100	<100	<100				System adjustments after initial or second contingency including looping-in the Rancho Vista-Serrano line into Mira Loma.
METRO-T-13	MIRALOMA 500/230 KV #1 OR #2	MIRALOMA 500/230 KV #2 OR #1 & MIRALOMA – SERRANO 500 KV #2	P6	T-1/L-1	107.67	108.08	<100	<100	<100				System adjustments after first or second contingency including looping-in the Rancho Vista-Serrano line into Mira Loma and energizing the spare Mira Loma 500/230 kV transformer.
METRO-T-14	BARRE – LEWIS 230 KV #1	S.ONOFRE – SERRANO 230 KV # & BARRE – VILLA PK 230 KV #1	P6	L-1/L-1	<100	<100	<100	110.90	<100				Dispatch generation in Orange County after intitial contingency .
METRO-T-15	MIRALOMA – SERRANO 500 KV #2	LUGO – RANCHVST 500 KV #1 & PALOVRDE – COLRIVER 500 KV #1	P6	L-1/L-1	105.65	<100	<100	<100	<100				Dispatch generation in LA Basin or loop-in Rancho Vista-Serrano line into Mira Loma after initial or second contingency.
METRO-T-16	MIDWAY – WIRLWIND 500 KV #3	MIDWAY – VINCENT 500 KV #1 & #2	P7	L-2	111.72	108.60	104.57	<100	<100				Reduce transfers on Path 26 within 30 minutes after the contingency.

Study Area: SCE Metro

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %								Potential Mitigation Solutions
					2017 Summer Peak	2020 Summer Peak	2025 Summer Peak	2017 Spring Off-Peak	2020 Spring Light Load	N/A	N/A	N/A	
Metro-VD-1	GOLETA 66 KV	S.CLARA – GOLETA #1 OR #2	P1	L-1	<5%	<5%	<5%	<5%	5%	<5%	<5%	<5%	Voltage deviation at limit. Available generators at Goletta can be used to reduce voltage deviation.

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High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)								Potential Mitigation Solutions
					2017 Summer Peak	2020 Summer Peak	2025 Summer Peak	2017 Spring Off-Peak	2020 Spring Light Load	N/A	N/A	N/A	

No high/low voltage deviations identified.

ID	Contingency	Category	Category Description	Transient Stability Performance								Potential Mitigation Solutions
				2017 Summer Peak	2020 Summer Peak	2025 Summer Peak	2017 Spring Off-Peak	2020 Spring Light Load	N/A	N/A	N/A	
X-TS-1												

Single Contingency Load Drop

ID	Worst Contingency	Category	Category Description	Amount of Load Drop (MW)								Potential Mitigation Solutions
				2017 Summer Peak	2020 Summer Peak	2025 Summer Peak	2017 Spring Off-Peak	2020 Spring Light Load	N/A	N/A	N/A	
X-SP-SLD-1												

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

Study Area: SCE Metro

Single Source Substation with more than 100 MW Load

ID	Substation	Load Served (MW)								Potential Mitigation Solutions
		2017 Summer Peak	2020 Summer Peak	2025 Summer Peak	2017 Spring Off-Peak	2020 Spring Light Load	N/A	N/A	N/A	
X-SP-SS-1										

No single source substation with more than 100 MW Load