2022-2023 ISO Reliability Assessment - Preliminary Study Results
Study Area: SCE Eastern area
Thermal Overloads

California ISO

Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)					Loading % (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2027 SP with Forecasted Load Addition	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Heavy Renewable & Min Gas Gen	
J.HINDS - MIRAGE 230 kV #1	CAMINO - GENE - IRON MTN - MEAD 230 KV (4 terminal line)	P1	N-1	<100	<100	<100	107.1	<100	<100	<100	<100	Blythe RAS
	JHINDMWD - EAGLEMTN 230 kV	P1	N-1	135.4	<100	136.4	140.0	<100	<100	<100	<100	Blythe RAS
	CBs-J.HindsMWD | J.HindMWD portion & EagleMTN-J.Hinds Jh & Eagle Shunt Reactor (P2 with long lead time equipment loss)	P2	Bus-Tie Breaker	135.4	<100	136.4	140.0	<100	<100	<100	<100	Blythe RAS
	CBs-EagleMTN | loss EagleMTN sub. Jh & Eagle Shunt Reactor (P2 with long lead time equipment loss)	P2	Bus-Tie Breaker	114.1	<100	114.7	140.0	<100	<100	<100	<100	Blythe RAS
	CB405 EagleMTN | loss EagleMTN sub and J.Hind MWD portion Jh & Eagle Shunt Reactor (P2 with long lead time equipment loss)	P2	Bus-Tie Breaker	135.2	<100	136.2	140.0	<100	<100	<100	<100	Blythe RAS
	CB407 EagleMTN | loss EagleMTN sub and EagleMT-IronMTN Jh & Eagle Shunt Reactor (P2 with long lead time equipment loss)	P2	Bus-Tie Breaker	114.0	<100	114.6	140.0	<100	<100	<100	<100	Blythe RAS
	CB307 Eagle | Iron-Camino-Gene-Mead 230kV-loss Iron Jh Shunt Reactor (P2 with long lead time equipment loss)	P2	Bus-Tie Breaker	<100	<100	<100	107.7	<100	<100	<100	<100	Blythe RAS
	CB405 Eagle | Iron-Camino-Gene-Mead 230kV-loss Iron Eagle Shunt Reactor (P2 with long lead time equipment loss)	P2	Bus-Tie Breaker	<100	<100	<100	107.7	<100	<100	<100	<100	Blythe RAS
	CB208 Iron | Camino-Gene-Mead-Parker 230kV-loss Gene Jh Shunt Reactor (P2 with long lead time equipment loss)	P2	Bus-Tie Breaker	<100	<100	<100	107.1	<100	<100	<100	<100	Blythe RAS
	CB208 Iron | Camino-Gene-Mead-Parker 230kV-loss Gene Eagle Shunt Reactor (P2 with long lead time equipment loss)	P2	Bus-Tie Breaker	<100	<100	<100	107.1	<100	<100	<100	<100	Blythe RAS
	CB405-EagleMT | Line JHINDMWD - EAGLEMTN 230 kV Jh Shunt Reactor (P2 with long lead time equipment loss)	P2	Bus-Tie Breaker	114.2	<100	114.9	140.0	<100	<100	<100	<100	Blythe RAS
	CB405-EagleMT| Line JHINDMWD - EAGLEMTN 230 kV Eagle Shunt Reactor (P2 with long lead time equipment loss)	P2	Bus-Tie Breaker	114.2	<100	114.9	140.0	<100	<100	<100	<100	Blythe RAS
	CB407-EagleMT| Line EAGLEMTN - IRON MTN 230 kV Jh Shunt Reactor (P2 with long lead time equipment loss)	P2	Bus-Tie Breaker	<100	<100	<100	108.2	<100	<100	<100	<100	Blythe RAS
	CB407-EagleMT| Line EAGLEMTN - IRON MTN 230 kV Eagle Shunt Reactor (P2 with long lead time equipment loss)	P2	Bus-Tie Breaker	<100	<100	<100	108.2	<100	<100	<100	<100	Blythe RAS
J.HINDS MWD - EAGLE MTN 230 kV #1	J.HINDS - MIRAGE 230 kV and BLYTHESC - EAGLEMTN 161 kV	P6	N-1-1	122.4	<100	120.5	<100	<100	<100	<100	<100	Curtail Blythe area generation after the first contingency
	DEVERS - MIRAGE 230 kV #1 and DEVERS - MIRAGE 230 kV #2	P7	DCTL	111.4	<100	180.8	153.0	126.7	<100	<100	<100	Path 42 RAS
	J.HINDS - MIRAGE 230 kV	P1	N-1	116.2	<100	115.6	148.2	<100	<100	<100	<100	Blythe RAS
J.HIND MWD - J.HINDS 230 kV #1	DEVERS - MIRAGE 230 kV #1 and DEVERS - MIRAGE 230 kV #2	P7	DCTL	132.8	<100	205.3	153.2	127.1	<100	<100	<100	Path 42 RAS
	J.HINDS - MIRAGE 230 kV	P1	N-1	138.3	<100	137.6	148.4	<100	<100	<100	<100	Blythe RAS
RED BLUFF 500/230/13.8 kV #1	RED BLUFF 500/230/13.8 kV #2	P1	N-1	<100	<100	<100	<100	<100	<100	133.6	<100	Colorado River CRAS
RED BLUFF 500/230/13.8 kV #2	RED BLUFF 500/230/13.8 kV #1	P1	N-1	<100	<100	<100	<100	<100	<100	134.4	<100	Colorado River CRAS
COL. RIVER 500/230/13.8 kV #1	COLRIVER 500/230/13.8 kV #2	P1	N-1	122.5	117.9	<100	<100	<100	117.6	143.0	<100	Colorado River CRAS
COL. RIVER 500/230/13.8 kV #2	COLRIVER 500/230/13.8 kV #1	P1	N-1	122.7	117.9	<100	<100	<100	117.6	143.3	<100	Colorado River CRAS
EAGLE MTN - IRON MTN 230 kV #1	J.HINDS - MIRAGE 230 kV and BLYTHESC - EAGLEMTN 161 kV	P6	N-1-1	141.5	<100	138.5	<100	<100	<100	<100	<100	Curtail Blythe area generation after the first contingency
	DEVERS - MIRAGE 230 kV #1 and DEVERS - MIRAGE 230 kV #2	P7	DCTL	<100	<100	154.2	158.3	135.9	<100	<100	<100	Path 42 RAS
	J.HINDS - MIRAGE 230 kV	P1	N-1	<100	<100	<100	141.4	<100	<100	<100	<100	Blythe RAS
IRON MTN - CAMINO 230kV	J.HINDS - MIRAGE 230 kV and BLYTHESC - EAGLEMTN 161 kV	P6	N-1-1	106.8	<100	104.5	<100	<100	<100	<100	<100	Curtail Blythe area generation after the first contingency
	DEVERS - MIRAGE 230 kV #1 and DEVERS - MIRAGE 230 kV #2	P7	DCTL	<100	<100	<100	130.0	<100	<100	<100	<100	Path 42 RAS
	J.HINDS - MIRAGE 230 kV	P1	N-1	<100	<100	<100	115.9	<100	<100	<100	<100	Blythe RAS

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				2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2027 SP with Forecasted Load Addition	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Heavy Renewable & Min Gas Gen	
VEGA_3_SS - NILAND 161kV	RAMON - MIRAGE #1 and CVSUB - MIRAGE 230kV #1	P6	N-1-1	106.4	<100	<100	<100	<100	<100	110.4	<100	Path 42 RAS
RAMON - MIRAGE 230 kV # 2	RAMON - MIRAGE 230kV and CVSUB - RAMON 230kV	P6	N-1-1	<100	<100	131.6	<100	117.2	<100	<100	<100	Curtail IID area generation after the first contingency

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Substation	Contingency (All and Worst P6)	Category	Category Description	High/Low Voltage	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
					2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2027 SP with Forecasted Load Addition	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Heavy Renewable & Min Gas Gen	2035 SP with Additional Transportation Electrification	
EAGLEMTN	J.HINDS - MIRAGE 230 kV Line BLYTHESC - EAGLEMTN 161 kV	P6	N-1-1	Low Voltage	0.87	>0.90	0.89	>0.90	>0.90	>0.90	0.88	>0.90	>0.90	Curtail Blythe area generation after the first contingency
MIRAGE	DEVERS - MIRAGE 230 kV #1 and DEVERS - MIRAGE 230 kV #2	P6	N-1-1	High Voltage	<1.10	1.12	<1.10	<1.10	<1.10	1.12	<1.10	1.12	<1.10	Path 42 RAS (further investigation)
EAGLEMTN				Low Voltage	>0.90	>0.90	0.83	>0.90	0.86	>0.90	>0.90	>0.90	>0.90	Path 42 RAS (further investigation)
RAMON	RAMON - MIRAGE 230kV and CVSUB - RAMON 230kV	P6	N-1-1	High Voltage	1.16	<1.10	<1.10	1.43	<1.10	<1.10	1.15	1.43	<1.10	Curtail IID area generation after the first contingency
REDBLUFF	DEVERS 500/230/13.8 #1 Gen MountainView Block 1	P6	N-1-1	High Voltage	1.11	<1.10	<1.10	<1.10	<1.10	<1.10	<1.10	<1.10	<1.10	Further investigation
EAGLEMTN	J.HINDS - MIRAGE 230 kV EAGLEMTN-IRON MTN 230 kV	P6	N-1-1	High Voltage	<1.10	<1.10	<1.10	<1.10	<1.10	<1.10	<1.10	1.22	<1.10	Curtail Blythe area generation after the first contingency

Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)		
				2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2027 SP with Forecasted Load Addition	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Heavy Renewable & Min Gas Gen
No issues found											

Contingency	Category	Category Description	Transient Stability Performance					Potential Mitigation Solutions
			Baseline Scenarios			Sensitivity Scenarios		
			2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 SP High CEC Forecast	2024 OP Heavy Renewable & Min Gas Gen	
EagleMTN-BlytheSCE 161 kV	P1	N-1	No Issues	No Issues	No Issues	*	*	
EagleMTN-BlytheSCE 161 kV & Blythe 1CT	P1	N-1	No Issues	No Issues	No Issues	*	*	
EagleMTN-IronMTN 230 kV	P1	N-1	No Issues	No Issues	No Issues	*	*	
Julian Hinds-EagleMTN 230 kV	P1	N-1	No Issues	No Issues	No Issues	*	*	
Julian Hinds-EagleMTN 230 kV & Blythe 1CT trip (RAS)	P1	N-1	No Issues	No Issues	No Issues	*	*	
Julian Hinds-Mirage 230 kV	P1	N-1	No Issues	No Issues	Unstable	*	*	Blythe RAS
Julian Hinds-Mirage 230 kV & Blythe 1CT trip (RAS)	P1	N-1	No Issues	No Issues	No Issues	*	*	
Colorado River-Palo Verde 500 kV	P1	N-1	No Issues	No Issues	No Issues	*	*	
Colorado River-Palo Verde 500 kV, no Devers SVC	P1	N-1	No Issues	No Issues	No Issues	*	*	
Colorado River - Red Bluff 500 kV #1	P1	N-1	No Issues	No Issues	No Issues	*	*	
Colorado River - Red Bluff 500 kV #1, no Devers SVC	P1	N-1	No Issues	No Issues	No Issues	*	*	
Devers - Red Bluff 500 kV #1	P1	N-1	No Issues	No Issues	No Issues	*	*	
Devers - Red Bluff 500 kV #1 , no Devers SVC	P1	N-1	No Issues	No Issues	No Issues	*	*	
Devers-Valley 500 kV #1	P1	N-1	No Issues	No Issues	No Issues	*	*	
Devers-Valley 500 kV #1, no Devers SVC	P1	N-1	No Issues	No Issues	No Issues	*	*	
Valley-Serrano/Alberhill 500 kV	P1	N-1	No Issues	No Issues	No Issues	*	*	
Valley-Serrano/Alberhill 500 kV, no Devers SVC	P1	N-1	*	No Issues	No Issues	*	*	
Devers 500/230 AA #2	P1	N-1	*	No Issues	No Issues	*	*	
Devers 500/230 AA #2 , no Devers SVC	P1	N-1	*	No Issues	No Issues	*	*	
Imperial Valley - N. Gila 500 kV	P1	N-1	*	No Issues	No Issues	*	*	
Imperial Valley - N. Gila 500 kV, no Devers SVC	P1	N-1	*	No Issues	No Issues	*	*	
Julian Hinds Bus tie CB fault, loss Julian Hinds	P2.4	Bus-Tie-Breaker	No Issues	No Issues	No Issues	*	*	
Devers Middle CB fault, loss of Devers - Red Bluff 500 kV #1 and Devers-Valley 500 kV #1, no Devers SVC	P2.3	Non-Bus-Tie Breaker	*	No Issues	No Issues	*	*	
Devers Middle CB fault, loss of Devers - Red Bluff 500 kV #2 and Devers 1AA Bank, no Devers SVC	P2.3	Non-Bus-Tie Breaker	*	No Issues	No Issues	*	*	
BlytheSCE-EagleMTN 161 kV, CB 872 stuck at BlytheSCE	P4.2	Breaker Failure	No Issues	No Issues	No Issues	*	*	
BlytheSCE-EagleMTN 161 kV, CB 872 stuck at BlytheSCE & Blythe 1CT trip (RAS)	P4.2	Breaker Failure	No Issues	No Issues	No Issues	*	*	
BlytheSCE-EagleMTN 161 kV, CB 70 stuck at EagleMTN	P4.2	Breaker Failure	No Issues	No Issues	No Issues	*	*	
BlytheSCE-EagleMTN 161 kV, CB 70 stuck at EagleMTN & Blythe 1CT trip (RAS)	P4.2	Breaker Failure	No Issues	No Issues	No Issues	*	*	
EagleMTN-IronMTN 230 kV, CB 407 stuck at EagleMTN	P4.2	Breaker Failure	No Issues	No Issues	No Issues	*	*	
EagleMTN-IronMTN 230 kV, CB 407 stuck at EagleMTN & Blythe 1CT trip (RAS)	P4.2	Breaker Failure	No Issues	No Issues	No Issues	*	*	
EagleMTN-IronMTN 230 kV, CB 307 stuck (close to Iron)	P4.2	Breaker Failure	No Issues	No Issues	No Issues	*	*	
Julian Hinds-EagleMTN 230 kV, CB 405 stuck at EagleMTN	P4.2	Breaker Failure	No Issues	No Issues	No Issues	*	*	
Julian Hinds-EagleMTN 230 kV, CB 405 stuck at EagleMTN & Blythe 1CT trip (RAS)	P4.2	Breaker Failure	No Issues	No Issues	No Issues	*	*	
Julian Hinds-Mirage 230 kV, Stuck CB 509 at J.Hinds	P4.2	Breaker Failure	No Issues	No Issues	No Issues	*	*	
EagleMTN 230/161 kV Transformer #5, Stuck CB432 at EagleMTN	P4.3	Breaker Failure	No Issues	No Issues	No Issues	*	*	
EagleMTN 230/161 kV Transformer #5, Stuck CB432 at EagleMTN & Blythe 1CT trip (RAS)	P4.3	Breaker Failure	No Issues	No Issues	No Issues	*	*	
Valley-Serrano/Alberhill 500 kV with stuck breaker followed by Valley 4AA Bank	P4.2	Breaker Failure	No Issues	No Issues	No Issues	*	*	
Devers - Red Bluff 500 kV #1 with stuck breaker followed by Devers-Valley 500 kV #1	P4.2	Breaker Failure	No Issues	No Issues	No Issues	*	*	
Devers - Red Bluff 500 kV #2 with stuck breaker followed by Devers 1AA bank	P4.2	Breaker Failure	No Issues	No Issues	No Issues	*	*	
Devers - Mirage 230 kV with stuck breaker followed by Coachell Valley-Mirage 230 kV	P4.2	Breaker Failure	No Issues	No Issues	No Issues	*	*	
Devers - Vista 230 kV with stuck breaker followed by Devers 3A bank	P4.2	Breaker Failure	No Issues	No Issues	No Issues	*	*	
Devers - Vista 230 kV #2 with stuck breaker followed by Devers-San Bernardino 230 kV	P4.2	Breaker Failure	No Issues	No Issues	No Issues	*	*	
Devers - El Casco 230 kV with stuck breaker followed by El Casco 2A bank	P4.2	Breaker Failure	No Issues	No Issues	No Issues	*	*	
Mirage-J.Hinds 230 kV with stuck breaker followed by Mirage-Ramon 230 kV	P4.2	Breaker Failure	No Issues	No Issues	No Issues	*	*	
Mirage-J.Hinds 230 kV with stuck breaker followed by Mirage-Ramon 230 kV Blythe 1CT trip (RAS)	P4.2	Breaker Failure	No Issues	No Issues	No Issues	*	*	
BlytheSCE-EagleMTN 161 kV, non-redundant pilot relay fail (20% Blythe)	P5.2	Non-Redundant Protection	No Issues	No Issues	No Issues	*	*	
BlytheSCE-EagleMTN 161 kV, non-redundant pilot relay fail (20% EagleMTN)	P5.2	Non-Redundant Protection	No Issues	No Issues	Diverge	*	*	Add redundant pilot relay
EagleMTN-IronMTN 230 kV, non-redundant pilot relay fail (20% EagleMTN)	P5.2	Non-Redundant Protection	No Issues	No Issues	Diverge	*	*	Add redundant pilot relay
EagleMTN-IronMTN 230 kV, non-redundant pilot relay fail (20% IronMTN)	P5.2	Non-Redundant Protection	No Issues	No Issues	No Issues	*	*	
Julian Hinds-EagleMTN 230 kV, non-redundant pilot relay fail (20% EagleMTN)	P5.2	Non-Redundant Protection	*	No Issues	Diverge	*	*	Add redundant pilot relay
Julian Hinds-EagleMTN 230 kV & Blythe 1CT trip (RAS), non-redundant pilot relay fail	P5.2	Non-Redundant Protection	*	No Issues	Diverge	*	*	Add redundant pilot relay
Julian Hinds-EagleMTN 230 kV, non-redundant pilot relay fail (20% Julian Hinds)	P5.2	Non-Redundant Protection	*	No Issues	No Issues	*	*	
Julian Hinds-EagleMTN 230 kV & Blythe 1CT trip (RAS), non-redundant pilot relay fail	P5.2	Non-Redundant Protection	No Issues	No Issues	Diverge	*	*	Add redundant pilot relay
Julian Hinds-Mirage 230 kV, non-redundant pilot relay fail (20% Julian Hinds)	P5.2	Non-Redundant Protection	No Issues	No Issues	Unstable	*	*	Add redundant pilot relay
Julian Hinds-Mirage 230 kV & Blythe 1CT trip (RAS),non-redundant pilot relay fail	P5.2	Non-Redundant Protection	No Issues	No Issues	Diverge	*	*	Add redundant pilot relay
Julian Hinds-Mirage 230 kV, non-redundant pilot relay fail (20% Mirage)	P5.2	Non-Redundant Protection	No Issues	No Issues	Diverge	*	*	Add redundant pilot relay
Julian Hinds-Mirage 230 kV & Blythe 1CT trip (RAS), , non-redundant pilot relay fail	P5.2	Non-Redundant Protection	No Issues	No Issues	Diverge	*	*	Add redundant pilot relay
Julian Hinds-Mirage & EagleMTN-IronMTN 230 kV	P6.1	N-1-1	Diverge	Diverge	Unstable	*	*	ISO7720 (OP)
Julian Hinds-Mirage & EagleMTN-IronMTN 230 kV & ISO7720 (OP)	P6.1	N-1-1	Diverge	No Issues	Diverge	*	*	System adjustments after the first contingency
Colorado River - Red Bluff 500 kV #1 & #2	P6.1	N-1-1	*	No Issues	No Issues	*	*	

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			Baseline Scenarios			Sensitivity Scenarios		
			2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 SP High CEC Forecast	2024 OP Heavy Renewable & Min Gas Gen	
Devers - Red Bluff 500 kV #1 & #2	P6.1	N-1-1	*	No Issues	No Issues	*	*	
Devers - Valley 500 kV #1 & #2	P6.1	N-1-1	No Issues	No Issues	No Issues	*	*	
Etiwanda - San Bernardino & El Casco-San Bernardino 230kV	P6.1	N-1-1	No Issues	No Issues	No Issues	*	*	
San Bernardino - Vista & Devers - San Bernardino 230kV	P6.1	N-1-1	No Issues	No Issues	No Issues	*	*	
Colorado River - Palo Verde & Colorado River - Delaney 500 kV	P6.1	N-1-1	*	No Issues	No Issues	*	*	
Mirage-Ramon & Coachella Valley-Mirage 230 kV	P6.1	N-1-1	Diverge	No Issues	Diverge	*	*	System adjustments after the first contingency
Mirage-Ramon & Coachella Valley-Mirage 230 kV with RAS	P6.1	N-1-1	*	No Issues	Diverge	*	*	System adjustments after the first contingency
Devers - Mirage 230 kV #1 & #2	P7.1	DCTL	No Issues	Diverge	Diverge	*	*	Further investigation
Devers - Mirage 230 kV #1 & #2 with RAS	P7.1	DCTL	No Issues	Diverge	Unstable	*	*	Further investigation
Devers-Glimmer & Devers-El Casco 230 kV	P7.1	DCTL	*	No Issues	No Issues	*	*	
Glimmer-San Bernardino & San Bernardino-El Casco 230 kV	P7.1	DCTL	No Issues	No Issues	No Issues	*	*	
Devers - Vista 230 kV #1 & #2	P7.1	DCTL	No Issues	No Issues	No Issues	*	*	
Etiwanda-San Bernardino & San Bernardino-Vista 230 kV	P7.1	DCTL	No Issues	No Issues	No Issues	*	*	
Mira Loma-Vista #2 & Mira Loma-Vista #1/Vista-Wildlife 230 kV	P7.1	DCTL	No Issues	No Issues	No Issues	*	*	
Coachella Valley-Ramon & Coachella Valley-Mirage 230 kV	P7.1	DCTL	Diverge	Unstable	Diverge	*	*	Further investigation
Coachella Valley-Ramon & Coachella Valley-Mirage 230 kV with RAS	P7.1	DCTL	Diverge	Unstable	Diverge	*	*	Further investigation
Non Redundant DC Supply								
EagleMTN 230 kV Bus, non-Redundant DC Supply fail	P5.3.13c	Non-Redundant DC Supply	WECC criteria not met	WECC criteria not met	WECC criteria not met	WECC criteria not met	*	
Julian Hinds 230 kV Bus, non-Redundant DC Supply fail	P5.3.13c	Non-Redundant DC Supply	WECC criteria not met	WECC criteria not met	WECC criteria not met	WECC criteria not met	*	
BlytheSCE 161 kV Bus, non-Redundant DC Supply fail	P5.3.13c	Non-Redundant DC Supply	WECC criteria not met	WECC criteria not met	WECC criteria not met	WECC criteria not met	*	
Mirage 230 kV Bus, non-Redundant DC Supply fail	P5.3.13c	Non-Redundant DC Supply	WECC criteria not met	WECC criteria not met	WECC criteria not met	WECC criteria not met	*	
Devers 500 kV Bus, non-Redundant DC Supply fail	P5.3.13c	Non-Redundant DC Supply	WECC criteria not met	WECC criteria not met	WECC criteria not met	WECC criteria not met	*	
El Casco 230 kV Bus, non-Redundant DC Supply fail	P5.3.13c	Non-Redundant DC Supply	WECC criteria not met	WECC criteria not met	WECC criteria not met	WECC criteria not met	*	
San Bernardino 230 kV Bus, non-Redundant DC Supply fail	P5.3.13c	Non-Redundant DC Supply	WECC criteria not met	WECC criteria not met	WECC criteria not met	WECC criteria not met	*	
Vista 230 kV Bus, non-Redundant DC Supply fail	P5.3.13c	Non-Redundant DC Supply	WECC criteria not met	WECC criteria not met	WECC criteria not met	WECC criteria not met	*	
Etiwanda 230 kV Bus, non-Redundant DC Supply fail	P5.3.13c	Non-Redundant DC Supply	WECC criteria not met	WECC criteria not met	WECC criteria not met	WECC criteria not met	*	
Valley 500 kV Bus, non-Redundant DC Supply fail	P5.3.13c	Non-Redundant DC Supply	WECC criteria not met	WECC criteria not met	WECC criteria not met	WECC criteria not met	*	
Non Redundant Trip Coils								
Colorado River-Palo Verde 500 kV, non-Redundant Trip Coil fail at Colorado River	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Colorado River-Red Bluff 500 kV #1 , non-Redundant Trip Coil fail at Colorado River	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Colorado River 1AA Bank, non-Redundant Trip Coil fail at Colorado River	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Colorado River-Genesis 230 kV, non-Redundant Trip Coil fail at Colorado River	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Colorado River-Black Creek 230 kV, non-Redundant Trip Coil fail at Colorado River	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Colorado River-Dracker 230 kV, non-Redundant Trip Coil fail at Colorado River	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Colorado River-Suncatcher 230 kV, non-Redundant Trip Coil fail at Colorado River	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Colorado River-Crimson 230 kV, non-Redundant Trip Coil fail at Colorado River	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Colorado River-Centipede 230 kV, non-Redundant Trip Coil fail at Colorado River	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Colorado River-Filippi 230 kV, non-Redundant Trip Coil fail at Colorado River	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Colorado River-Red Bluff 500 kV #1 , non-Redundant Trip Coil fail at Red Bluff	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Red Bluff 1AA Bank, non-Redundant Trip Coil fail at Red Bluff	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Devers-Red Bluff 500 kV No. 2, non-Redundant Trip Coil fail at Red Bluff	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Desert Sunlight-Red Bluff 230 kV, non-Redundant Trip Coil fail at Red Bluff	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Black Ranch-Red Bluff 230 kV, non-Redundant Trip Coil fail at Red Bluff	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Almasol-Red Bluff 230 kV, non-Redundant Trip Coil fail at Red Bluff	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Devers-Red Bluff 500 kV No. 2, non-Redundant Trip Coil fail at Devers	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Devers-Valley 500 kV No. 1, non-Redundant Trip Coil fail at Devers	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Devers 1AA Bank, non-Redundant Trip Coil fail at Devers	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Devers-El Casco 230 kV, non-Redundant Trip Coil fail at Devers	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Devers-Mirage 230 kV No. 1 , non-Redundant Trip Coil fail at Devers	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Devers-Glimmer 230 kV, non-Redundant Trip Coil fail at Devers	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Devers-Sentinel 230 kV, non-Redundant Trip Coil fail at Devers	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Devers-Vista 230 kV No. 2, non-Redundant Trip Coil fail at Devers	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Devers-El Casco 230 kV, non-Redundant Trip Coil fail at El Casco	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
El Casco-San Bernadino 230 kV, non-Redundant Trip Coil fail at El Casco	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
El Casco-San Bernadino 230 kV, non-Redundant Trip Coil fail at San Bernadino	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Glimmer-San Bernadino 230 kV, non-Redundant Trip Coil fail at San Bernadino	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Etiwanda-San Bernardino 230 kV, non-Redundant Trip Coil fail at San Bernadino	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Mountainview-San Bernardino 230 kV No. 3, non-Redundant Trip Coil fail at San Bernadino	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
San Bernardino-Vista 230 kV, non-Redundant Trip Coil fail at San Bernadino	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	

Contingency	Category	Category Description	Transient Stability Performance					Potential Mitigation Solutions
			Baseline Scenarios			Sensitivity Scenarios		
			2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 SP High CEC Forecast	2024 OP Heavy Renewable & Min Gas Gen	
San Bernardino-Vista 230 kV, non-Redundant Trip Coil fail at Vista	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Devers-Vista 230 kV No. 1, non-Redundant Trip Coil fail at Vista	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Etiwanda-Vista 230 kV, non-Redundant Trip Coil fail at Vista	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Mira Loma-Vista 230 kV No. 1, non-Redundant Trip Coil fail at Vista	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Mira Loma-Vista 230 kV No. 2, non-Redundant Trip Coil fail at Vista	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Etiwanda-San Bernadino 230 kV, non-Redundant Trip Coil fail at Etiwanda	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Etiwanda-Vista 230 kV, non-Redundant Trip Coil fail at Etiwanda	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Devers-Valley 500 kV No. 1, non-Redundant Trip Coil fail at Valley	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Serrano-Valley 500 kV, non-Redundant Trip Coil fail at Valley	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Valley 1AA Bank, non-Redundant Trip Coil fail at Valley	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Valley 4AA Bank, non-Redundant Trip Coil fail at Valley	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Devers-Mirage 230 kV No. 1 , non-Redundant Trip Coil fail at Mirage	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Julian Hinds-Mirage 230 kV, non-Redundant Trip Coil fail at Mirage	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Mirage-Ramon 230 kV, non-Redundant Trip Coil fail at Mirage	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Coachella Valley-Mirage 230 kV, non-Redundant Trip Coil fail at Mirage	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Julian Hinds-Mirage 230 kV, non-Redundant Trip Coil fail at Julian Hinds	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Buck Blvd-Julian Hinds 230 kV, non-Redundant Trip Coil fail at Julian Hinds	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	
Eagle Mtn-Julian Hinds (MWD) , non-Redundant Trip Coil fail at Julian Hinds	P5.4.13d	Non-Redundant TC	No Issues	No Issues	No Issues	No Issues	*	

*Results pending further review.

Worst Contingency	Category	Category Description	Amount of Load Drop (MW)												Potential Mitigation Solutions
			2023 Summer Peak	2026 Summer Peak	2031 Summer Peak	2023 Winter Peak	2026 Winter Peak	2031 Winter Peak	2023 Spring Off-Peak	2026 Spring Off-Peak	2031 Spring Off-Peak	2026 SP High CEC Forecast	2023 SP Heavy Renewable & Min Gas Gen	2023 OP Heavy Renewable & Min Gas Gen	

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

Substation	Load Served (MW)												Potential Mitigation Solutions
	2023 Summer Peak	2026 Summer Peak	2031 Summer Peak	2023 Winter Peak	2026 Winter Peak	2031 Winter Peak	2023 Spring Off-Peak	2026 Spring Off-Peak	2031 Spring Off-Peak	2026 SP High CEC Forecast	2023 SP Heavy Renewable & Min Gas Gen	2023 OP Heavy Renewable & Min Gas Gen	

No single source substation with more than 100 MW