Study Area: **Valley Electric Association - Summer Peak with renewables**

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-T-1	CANYON 138 kV---COLDCREK 138 kV Ckt #1	Line PAHRUMP 138.0 to VISTA 138.0 Circuit 1	B	L-1	101%	53%	4%	Notice NVE. Consider operation solution to trip VEA loads as an interim mitigation before Charleston-Vista 138 kV line is in service
VEA-T-2	CANYON 138 kV---SNOW MTN 138 kV Ckt #1		B	L-1	101%	53%	4%	
VEA-T-3	NWEST 138 kV---SNOW MTN 138 kV Ckt #1		B	L-1	102%	69%	5%	
VEA-T-4	CANYON 138 kV---COLDCREK 138 kV Ckt #1	Brkr Fail VISTA-PAHRUMP 138 & VISTA-CHARLESTON 138 1.000 CatC BKR Flt	C	Breaker Failure	NA	109%	96%	Collaborate with NVE to develop SPS to shed load prior to generation coming on line in VEA, or re-design bay positions for the two 138 kV lines at Vista 138 kV sub.
VEA-T-5	CANYON 138 kV---SNOW MTN 138 kV Ckt #1		C	Breaker Failure	NA	109%	96%	
VEA-T-6	COLDCREK 138 kV---RADAR 138 kV Ckt #1		C	Breaker Failure	NA	104%	91%	
VEA-T-7	IS TAP 138 kV---RADAR 138 kV Ckt #1		C	Breaker Failure	NA	104%	90%	
VEA-T-8	NWEST 138 kV---SNOW MTN 138 kV Ckt #1		C	Breaker Failure	NA	110%	98%	
VEA-T-9	CANYON 138 kV---COLDCREK 138 kV Ckt #1	Brkr Fail PAHRUMP-VISTA 138 & PAHRUMP-GAMEBIRD 138 1.000 CatC BKR Flt	C	Breaker Failure	100%	90%	85%	Collaborate with NVE to develop SPS to shed load prior to generation coming on line in VEA, or re-arrange bay positions for the two 138 kV lines at Pahrump 138 kV sub.
VEA-T-10	CANYON 138 kV---SNOW MTN 138 kV Ckt #1		C	Breaker Failure	101%	91%	85%	
VEA-T-11	NWEST 138 kV---SNOW MTN 138 kV Ckt #1		C	Breaker Failure	102%	91%	87%	
VEA-T-12	CANYON 138 kV---COLDCREK 138 kV Ckt #1	Line PAHRUMP 138.0 to VISTA 138.0 Ckt 1_Line GAMEBIRD 138.0 to THSNDAIR 138.0 Ckt 1	C	L-1/L-1	100%	Not Solved	Not Solved	Notice NVE. Develop SPS to open the 138 kV tie with VEA at Lathrop under second contingency, or manually open the 138 kV tie with NVE at Lathrop after first contingency to isolate potential impact/bloackout from the vicinity area (Zone 183/187)
VEA-T-13	CANYON 138 kV---SNOW MTN 138 kV Ckt #1		C	L-1/L-1	101%	Not Solved	Not Solved	
VEA-T-14	NWEST 138 kV---SNOW MTN 138 kV Ckt #1		C	L-1/L-1	102%	Not Solved	Not Solved	

Study Area: **Valley Electric Association - Summer Peak with renewables**

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-T-15	CANYON 138 kV---SNOW MTN 138 kV Ckt #1	Line PAHRUMP 138.0 to VISTA 138.0 Ckt 1_Line THSNDAIR 138.0 to CHARLSTN 138.0 Ckt 1	C	L-1/L-1	101%	132%	118%	Notice NVE. Develop SPS to open the 138 kV tie with VEA at Lathrop under second contingency, or manually open the 138 kV tie with NVE at Lathrop after first contingency to isolate potential impact/bloackout from the vicinity area (Zone 183/187)
VEA-T-16	IS TAP 138 kV---RADAR 138 kV Ckt #1		C	L-1/L-1	96%	126%	111%	
VEA-T-17	NWEST 138 kV---SNOW MTN 138 kV Ckt #1		C	L-1/L-1	102%	133%	119%	
VEA-T-18	CANYON 138 kV---COLDCREK 138 kV Ckt #1	Line NWEST 230.0 to DESERT VIEW 230.0 Ckt 1_Line PAHRUMP_1 230.0 to CRAZY EYE TP 230.0 Ckt 1	C	L-1/L-1	123%	128%	153%	Notice NVE. review existing UVLS to automatically shed loads, or operate the 138 kV system in radial with two independent supplies from Amargosa and Pahrump after first contingency to isolate potential impact on the vicinity area (Zone 183/187)
VEA-T-19	COLDCREK 138 kV---RADAR 138 kV Ckt #1		C	L-1/L-1	118%	123%	145%	
VEA-T-20	IS TAP 138 kV---MERCRYSW 138 kV Ckt #1		C	L-1/L-1	111%	115%	135%	
VEA-T-21	IS TAP 138 kV---RADAR 138 kV Ckt #1		C	L-1/L-1	118%	123%	145%	
VEA-T-22	NWEST 138 kV---SNOW MTN 138 kV Ckt #1		C	L-1/L-1	124%	130%	155%	
VEA-T-23	COLDCREK 138 kV---RADAR 138 kV Ckt #1	Line NWEST 230.0 to DESERT VIEW 230.0 Ckt 1_Line CRAZY EYE TP 230.0 to BOB TAP 230.0 Ckt 1	C	L-1/L-1	117%	122%	Not Solved	Notice NVE. On 2014 and 2017, review existing UVLS to shed loads, or operate the VEA 138 kV system in radial after first contingency to isolate potential impact on the vicinity area (Zone 183/187). On 2022, modify previous identified Crazy Eye SPS to cover this L1/L-1 event, or apply congestion management to curtail generation after one of three
VEA-T-24	IS TAP 138 kV---MERCRYSW 138 kV Ckt #1		C	L-1/L-1	111%	114%	Not Solved	
VEA-T-25	IS TAP 138 kV---RADAR 138 kV Ckt #1		C	L-1/L-1	117%	122%	Not Solved	
VEA-T-26	NWEST 138 kV---SNOW MTN 138 kV Ckt #1		C	L-1/L-1	124%	129%	Not Solved	
VEA-T-27	AMARGOSA 230 kV---AMARGOSA 138 kV Ckt #1		C	L-1/L-1	141%	153%	Not Solved	
VEA-T-28	CANYON 138 kV---COLDCREK 138 kV Ckt #1		C	L-1/L-1	129%	135%	Not Solved	

Study Area: **Valley Electric Association - Summer Peak with renewables**

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-T-29	CANYON 138 kV---SNOW MTN 138 kV Ckt #1	Line PAHRUMP_1 230.0 to DESERT VIEW 230.0 Ckt 1_Line PAHRUMP_1 230.0 to CRAZY EYE TP 230.0 Ckt 1	C	L-1/L-1	129%	135%	Not Solved	Notice NVE. review existing UVLS to shed loads, or operate the VEA 138 kV system in radial after first contingency to isolate potential impact on the vicinity area (Zone 183/187)
VEA-T-30	COLDCREK 138 kV---RADAR 138 kV Ckt #1		C	L-1/L-1	124%	129%	Not Solved	
VEA-T-31	IS TAP 138 kV---MERCRYSW 138 kV Ckt #1		C	L-1/L-1	117%	121%	Not Solved	
VEA-T-32	IS TAP 138 kV---RADAR 138 kV Ckt #1		C	L-1/L-1	123%	129%	Not Solved	
VEA-T-33	NWEST 138 kV---SNOW MTN 138 kV Ckt #1		C	L-1/L-1	130%	136%	Not Solved	
VEA-T-34	AMARGOSA 230 kV---AMARGOSA 138 kV Ckt #1	Line PAHRUMP_1 230.0 to DESERT VIEW 230.0 Ckt 1_Line CRAZY EYE TP 230.0 to BOB TAP 230.0 Ckt 1	C	L-1/L-1	140%	151%	Not Solved	Notice NVE. On 2014 and 2017, review existing UVLS to shed loads, or operate the VEA 138 kV system in radial after first contingency to isolate potential impact on the vicinity area (Zone 183/187). On 2022, modify previous identified Crazy Eye SPS to cover this L1/L-1 event, or apply congestion management to curtail generation after one of three generators are tripped by the SPS
VEA-T-35	CANYON 138 kV---COLDCREK 138 kV Ckt #1		C	L-1/L-1	128%	133%	Not Solved	
VEA-T-36	CANYON 138 kV---SNOW MTN 138 kV Ckt #1		C	L-1/L-1	128%	133%	Not Solved	
VEA-T-37	COLDCREK 138 kV---RADAR 138 kV Ckt #1		C	L-1/L-1	122%	127%	Not Solved	
VEA-T-38	IS TAP 138 kV---MERCRYSW 138 kV Ckt #1		C	L-1/L-1	116%	120%	Not Solved	
VEA-T-39	IS TAP 138 kV---RADAR 138 kV Ckt #1		C	L-1/L-1	122%	127%	Not Solved	
VEA-T-40	NWEST 138 kV---SNOW MTN 138 kV Ckt #1		C	L-1/L-1	130%	136%	Not Solved	

Study Area: **Valley Electric Association - Summer Peak with renewables**

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-T-41	AMARGOSA 230 kV---AMARGOSA 138 kV Ckt #1	Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 1 0.00_Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 2 0.00	C	T-1/T-1	141%	153%	Not Solved	Review existing UVLS to shed VEA loads, or operate the 138 kV system in radial with two independent supplies from Amargosa and Pahrump after first contingency to isolate potential impact on the vicinity area (Zone 183/187)
VEA-T-42	CANYON 138 kV---COLDCREK 138 kV Ckt #1		C	T-1/T-1	129%	135%	Not Solved	
VEA-T-43	CANYON 138 kV---SNOW MTN 138 kV Ckt #1		C	T-1/T-1	129%	135%	Not Solved	
VEA-T-44	COLDCREK 138 kV---RADAR 138 kV Ckt #1		C	T-1/T-1	124%	129%	Not Solved	
VEA-T-45	IS TAP 138 kV---MERCRYSW 138 kV Ckt #1		C	T-1/T-1	117%	122%	Not Solved	
VEA-T-46	IS TAP 138 kV---RADAR 138 kV Ckt #1		C	T-1/T-1	123%	129%	Not Solved	
VEA-T-47	NWEST 138 kV---SNOW MTN 138 kV Ckt #1		C	T-1/T-1	130%	136%	Not Solved	
VEA-T-48	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #2	Line AMARGOSA 138.0 to SANDY 138.0 Ckt 1_Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 1 0.00	C	T-1/L-1	107%	115%	80%	Develop higher emergency rating before upgrading the Pahrump 230/138 kV transformers
VEA-T-49	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #1	Line AMARGOSA 138.0 to SANDY 138.0 Ckt 1_Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 2 0.00	C	T-1/L-1	107%	115%	80%	Develop higher emergency rating before upgrading the Pahrump 230/138 kV transformers
VEA-T-50	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #2	Line GAMEBIRD 138.0 to GAMEBIRD_PST 138.0 Ckt bp_Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 1 0.00	C	T-1/L-1	103%	111%	85%	Develop higher emergency rating before upgrading the Pahrump 230/138 kV transformers
VEA-T-51	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #1	Line GAMEBIRD 138.0 to GAMEBIRD_PST 138.0 Ckt bp_Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 2 0.00	C	T-1/L-1	103%	111%	85%	Develop higher emergency rating before upgrading the Pahrump 230/138 kV transformers

Study Area: **Valley Electric Association - Summer Peak with renewables**

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-T-52	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #2	Line SANDY 138.0 to GAMEBIRD_PST 138.0 Ckt 1_Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 1 0.00	C	T-1/L-1	103%	111%	78%	Develop higher emergency rating before upgrading the Pahrump 230/138 kV transformers
VEA-T-53	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #1	Line SANDY 138.0 to GAMEBIRD_PST 138.0 Ckt 1_Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 2 0.00	C	T-1/L-1	103%	111%	78%	Develop higher emergency rating before upgrading the Pahrump 230/138 kV transformers
VEA-T-54	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #2	Tran AMARGOSA 230.00 to AMARGOSA 138.00 Ckt 1 0.00_Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 1 0.00	C	T-1/T-1	106%	114%	80%	Develop higher emergency rating before upgrading the Pahrump 230/138 kV transformers
VEA-T-55	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #1	Tran AMARGOSA 230.00 to AMARGOSA 138.00 Ckt 1 0.00_Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 2 0.00	C	T-1/T-1	106%	114%	80%	Develop higher emergency rating before upgrading the Pahrump 230/138 kV transformers
VEA-T-56	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #2	Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 1 0.00_Line IS TAP 138.0 to MERCRYSW 138.0 Ckt 1	C	T-1/L-1	108%	112%	76%	Notice NVE. Work out mitigation plan with NVE if VEA can't develop higher emergency rating for Pahrump 230/138 kV transformers
VEA-T-57	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #2	Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 1 0.00_Line CANYON 138.0 to COLDCREK 138.0 Ckt 1	C	T-1/L-1	115%	119%	81%	Notice NVE. Work out operation solution with NVE if VEA can't develop higher emergency rating for Pahrump 230/138 kV transformers

Study Area: **Valley Electric Association - Summer Peak with renewables**

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-T-58	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #2	Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 1 0.00_Line CANYON 138.0 to SNOW MTN 138.0 Ckt 1	C	T-1/L-1	115%	119%	81%	Notice NVE. Work out operation solution with NVE if VEA can't develop higher emergency rating for Pahrump 230/138 kV transformers
VEA-T-59	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #2	Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 1 0.00_Line COLDCREK 138.0 to RADAR 138.0 Ckt 1	C	T-1/L-1	111%	116%	79%	Notice NVE. Work out operation solution with NVE if VEA can't develop higher emergency rating for Pahrump 230/138 kV transformers
VEA-T-60	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #2	Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 1 0.00_Line IS TAP 138.0 to RADAR 138.0 Ckt 1	C	T-1/L-1	111%	115%	79%	Notice NVE. Work out operation solution with NVE if VEA can't develop higher emergency rating for Pahrump 230/138 kV transformers
VEA-T-61	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #2	Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 1 0.00_Line NWEST 138.0 to SNOW MTN 138.0 Ckt 1	C	T-1/L-1	115%	120%	82%	Notice NVE. Work out operation solution with NVE if VEA can't develop higher emergency rating for Pahrump 230/138 kV transformers
VEA-T-62	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #1	Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 2 0.00_Line IS TAP 138.0 to MERCRYSW 138.0 Ckt 1	C	T-1/L-1	108%	113%	76%	Notice NVE. Work out operation solution with NVE if VEA can't develop higher emergency rating for Pahrump 230/138 kV transformers

Study Area: **Valley Electric Association - Summer Peak with renewables**

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-T-63	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #1	Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 2 0.00_Line CANYON 138.0 to COLDCREK 138.0 Ckt 1	C	T-1/L-1	115%	120%	81%	Notice NVE. Work out operation solution with NVE if VEA can't develop higher emergency rating for Pahrump 230/138 kV transformers
VEA-T-64	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #1	Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 2 0.00_Line CANYON 138.0 to SNOW MTN 138.0 Ckt 1	C	T-1/L-1	115%	120%	81%	Notice NVE. Work out operation solution with NVE if VEA can't develop higher emergency rating for Pahrump 230/138 kV transformers
VEA-T-65	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #1	Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 2 0.00_Line COLDCREK 138.0 to RADAR 138.0 Ckt 1	C	T-1/L-1	112%	116%	79%	Notice NVE. Work out operation solution with NVE if VEA can't develop higher emergency rating for Pahrump 230/138 kV transformers
VEA-T-66	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #1	Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 2 0.00_Line IS TAP 138.0 to RADAR 138.0 Ckt 1	C	T-1/L-1	111%	116%	79%	Notice NVE. Work out operation solution with NVE if VEA can't develop higher emergency rating for Pahrump 230/138 kV transformers
VEA-T-67	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #1	Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 2 0.00_Line NWEST 138.0 to SNOW MTN 138.0 Ckt 1	C	T-1/L-1	116%	121%	82%	Notice NVE. Work out operation solution with NVE if VEA can't develop higher emergency rating for Pahrump 230/138 kV transformers

Study Area: **Valley Electric Association - Summer Peak with renewables**

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-T-68	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #2	Tran ELDORDO 500.0 to ELDORDO2 230.0 Ckt 1_Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 1 0.00	C	T-1/T-1	93%	104%	95%	Notice SCE. Develop higher emergency rating for Pahrump 230/138 kV transformers before upgrading them
VEA-T-69	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #1	Tran ELDORDO 500.0 to ELDORDO2 230.0 Ckt 1_Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 2 0.00	C	T-1/T-1	94%	105%	95%	Notice SCE. Develop higher emergency rating for Pahrump 230/138 kV transformers before upgrading them
VEA-T-70	PAHRUMP 138 kV---VISTA 138 kV Ckt #1	Line PAHRUMP 138.0 to GAMEBIRD 138.0 Ckt 1_Line CRAZY EYE TP 230.0 to BOB TAP 230.0 Ckt 1	C	L-1/L-1	24%	31%	169%	Modify previous identified Crazy Eye SPS to trip more generation after second contingency, or apply congestion management to curtail generation after one of the three units are tripped by the SPS
VEA-T-71	VEA Area - EOP 230 kV System	Tran ELDORDO 500.0 to ELDORDO2 230.0 Ckt 1_Line MEAD S 230.0 to BOB TAP 230.0 Ckt 1	C	T-1/L-1	NA	<100%	Not Solved	Notice SCE. Modify Crazy Eye SPS identified in Cluster Alpha and Ivanpah-Eldorado SPS identified in GIP, or apply congestion management to curtail generation after first contingency
VEA-T-72	MEAD S 230 kV---BOB TAP 230 kV Ckt #1	Tran ELDORDO 500.0 to ELDORDO2 230.0 Ckt 1_Line PAHRUMP_1 230.0 to CRAZY EYE TP 230.0 Ckt 1	C	T-1/L-1	6%	98%	153%	Notice SCE. Modify Ivanpah-Eldorado SPS identified in GIP

Study Area: **Valley Electric Association - Summer Light Load & Summer Off-Peak with renewables**

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Summer Off-Peak	N/A	
VEA-T-73	MEAD S 230 kV---BOB TAP 230 kV Ckt #1	Tran ELDORDO 500.0 to ELDORDO2 230.0 Ckt 1_Line PAHRUMP_1 230.0 to CRAZY EYE TP 230.0 Ckt 1	C	T1-L1	6%	101%		Notice SCE. Modify Ivanpah-Eldorado SPS identified in GIP

Study Area: **Valley Electric Association - Summer Peak with renewables**

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-VD-1	BEATTY 138 kV Bus	Line PAHRUMP 138.0 to VISTA 138.0 Circuit 1	B	L-1	-6.42%	-0.92%	-0.30%	Consider higher voltage deviation criteria (7%) before Charleston-Vista 138 kV line in service while improving PF on distribution loads at Vista/Beatty or adding dynamic reactive power support.
VEA-VD-2	BONDGDTP 138 kV Bus		B	L-1	-6.42%	-0.92%	-0.30%	
VEA-VD-3	FRENCHMN 138 kV Bus		B	L-1	-5.54%	-0.79%	-0.25%	
VEA-VD-4	GROOM LK 138 kV Bus		B	L-1	-5.95%	-0.86%	-0.31%	
VEA-VD-5	JACKASSF 138 kV Bus		B	L-1	-6.24%	-0.90%	-0.32%	
VEA-VD-6	JOHNNIE 138 kV Bus		B	L-1	-7.15%	-0.96%	-0.37%	
VEA-VD-7	LTHRPWLS 138 kV Bus		B	L-1	-6.40%	-0.92%	-0.31%	
VEA-VD-8	MERCRYSW 138 kV Bus		B	L-1	-5.29%	-0.75%	-0.22%	
VEA-VD-9	MERCURY 138 kV Bus		B	L-1	-5.29%	-0.76%	-0.21%	
VEA-VD-10	NTSCANYN 138 kV Bus		B	L-1	-6.21%	-0.90%	-0.33%	
VEA-VD-11	RAINIER 138 kV Bus		B	L-1	-6.01%	-0.87%	-0.32%	
VEA-VD-12	STOCKADE 138 kV Bus		B	L-1	-6.09%	-0.89%	-0.33%	
VEA-VD-13	VALLEYNT 138 kV Bus		B	L-1	-5.94%	-0.86%	-0.30%	
VEA-VD-14	VALLEYTP 138 kV Bus		B	L-1	-6.49%	-0.93%	-0.31%	
VEA-VD-15	VALLEYVE 138 kV Bus		B	L-1	-6.49%	-0.93%	-0.31%	
VEA-VD-16	VISTA 138 kV Bus		B	L-1	-7.15%	-0.92%	-0.32%	
VEA-VD-17	YUCCAFLT 138 kV Bus		B	L-1	-5.76%	-0.83%	-0.28%	
VEA-VD-18	CHARLSTN 138 kV Bus	Line PAHRUMP 138.0 to GAMEBIRD 138.0 Circuit 1	B	L-1	-13.26%	-1.60%	-1.79%	Consider higher voltage deviation criteria (7%) before Charleston-Vista 138 kV line in service while improving PF on distribution loads at Vista/Beatty and/or adding dynamic reactive power support.
VEA-VD-19	GAMEBIRD 138 kV Bus		B	L-1	-13.15%	-2.57%	-2.55%	
VEA-VD-20	SANDY 138 kV Bus		B	L-1	-10.51%	-2.04%	-1.65%	
VEA-VD-21	THSNDAIR 138 kV Bus		B	L-1	-13.21%	-2.28%	-2.32%	
VEA-VD-22	PAHRUMP_1 230 kV Bus	Line PAHRUMP_1 230.0 to CRAZY EYE TP 230.0 Circuit 1	B	L-1	-4.21%	-4.10%	-6.65%	May be waived due to non-load bus by requests, or consider higher voltage deviation criteria (7%)
VEA-VD-23	PAHRUMP_1 230 kV Bus	Line CRAZY EYE TP 230.0 to BOB TAP 230.0 Circuit 1	B	L-1	-3.64%	-3.53%	-5.15%	May be waived due to non-load bus by requests, or consider higher voltage deviation criteria (7%)
VEA-VD-24	CHARLSTN 138 kV Bus		C	Breaker Failure	-13.27%	-9.80%	-10.85%	

Study Area: **Valley Electric Association - Summer Peak with renewables**

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-VD-25	GAMEBIRD 138 kV Bus	Brkr Fail PAHRUMP-VISTA 138 & PAHRUMP-GAMEBIRD 138 1.000 CatC BKR Flt	C	Breaker Failure	-13.17%	-10.17%	-11.30%	Collaborate with NVE to develop SPS to shed load prior to generation coming on line in VEA, or re-design bay positions for the two 138 kV lines at Pahrump 138 kV sub.
VEA-VD-26	GAMEBIRD_PST138 kV Bus		C	Breaker Failure	-13.16%	-10.16%	-11.30%	
VEA-VD-27	JOHNNIE 138 kV Bus		C	Breaker Failure	-7.10%	-9.19%	-10.45%	
VEA-VD-28	SANDY 138 kV Bus		C	Breaker Failure	-10.53%	-8.18%	-8.74%	
VEA-VD-29	THSNDAIR 138 kV Bus		C	Breaker Failure	-13.22%	-10.09%	-11.20%	
VEA-VD-30	VISTA 138 kV Bus		C	Breaker Failure	-7.11%	-9.45%	-10.45%	
VEA-VD-31	AMARGOSA 138 kV Bus	Line NWEST 230.0 to DESERT VIEW 230.0 Ckt 1_Line PAHRUMP_1 230.0 to CRAZY EYE TP 230.0 Ckt 1	C	L-1/L-1	-6.56%	-6.98%	-10.38%	Review existing UVLS to shed VEA loads, or operate the 138 kV system in radial with two independent supplies from Amargosa and Pahrump after first contingency to isolate potential impact on the vicinity area (Zone 183/187)
VEA-VD-32	BEATTY 138 kV Bus		C	L-1/L-1	-16.05%	-16.98%	-28.06%	
VEA-VD-33	BONDGDTP 138 kV Bus		C	L-1/L-1	-16.05%	-16.98%	-28.04%	
VEA-VD-34	CHARLSTN 138 kV Bus		C	L-1/L-1	-19.33%	-20.02%	-32.67%	
VEA-VD-35	DESERT VIEW 230 kV Bus		C	L-1/L-1	-24.23%	-26.16%	-36.39%	
VEA-VD-36	FRENCHMN 138 kV Bus		C	L-1/L-1	-12.77%	-13.55%	-21.97%	
VEA-VD-37	GAMEBIRD 138 kV Bus		C	L-1/L-1	-19.17%	-20.00%	-32.59%	
VEA-VD-38	GROOM LK 138 kV Bus		C	L-1/L-1	-13.80%	-14.63%	-23.89%	
VEA-VD-39	IND SPR 138 kV Bus		C	L-1/L-1	-7.18%	-7.66%	-12.06%	
VEA-VD-40	IS TAP 138 kV Bus		C	L-1/L-1	-7.18%	-7.66%	-12.06%	
VEA-VD-41	JACKASSF 138 kV Bus		C	L-1/L-1	-14.89%	-15.76%	-25.88%	
VEA-VD-42	JOHNNIE 138 kV Bus		C	L-1/L-1	-18.52%	-19.54%	-32.13%	
VEA-VD-43	LTHRPWLS 138 kV Bus		C	L-1/L-1	-15.97%	-16.89%	-27.87%	
VEA-VD-44	MERCRYSW 138 kV Bus		C	L-1/L-1	-12.13%	-12.87%	-20.79%	
VEA-VD-45	MERCURY 138 kV Bus		C	L-1/L-1	-12.13%	-12.88%	-20.78%	
VEA-VD-46	NTSCANYN 138 kV Bus		C	L-1/L-1	-14.72%	-15.60%	-25.60%	
VEA-VD-47	PAHRUMP 138 kV Bus		C	L-1/L-1	-19.82%	-20.70%	-33.57%	
VEA-VD-48	PAHRUMP_1 230 kV Bus		C	L-1/L-1	-24.31%	-26.27%	-38.56%	
VEA-VD-49	RADAR 138 kV Bus		C	L-1/L-1	-6.89%	-7.35%	-11.56%	

Study Area: Valley Electric Association - Summer Peak with renewables

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-VD-50	RAINIER 138 kV Bus		C	L-1/L-1	-13.95%	-14.79%	-24.19%	
VEA-VD-51	SANDY 138 kV Bus		C	L-1/L-1	-15.69%	-16.49%	-25.12%	
VEA-VD-52	STOCKADE 138 kV Bus		C	L-1/L-1	-14.17%	-15.03%	-24.60%	
VEA-VD-53	THSNDAIR 138 kV Bus		C	L-1/L-1	-19.26%	-20.04%	-32.70%	
VEA-VD-54	VALLEYNT 138 kV Bus		C	L-1/L-1	-13.78%	-14.62%	-23.86%	
VEA-VD-55	VALLEYTP 138 kV Bus		C	L-1/L-1	-16.75%	-17.71%	-29.32%	
VEA-VD-56	VALLEYVE 138 kV Bus		C	L-1/L-1	-16.77%	-17.73%	-29.36%	
VEA-VD-57	VISTA 138 kV Bus		C	L-1/L-1	-18.88%	-19.90%	-32.45%	
VEA-VD-58	YUCCAFLT 138 kV Bus		C	L-1/L-1	-13.32%	-14.13%	-22.99%	
VEA-VD-59	DESERT VIEW 230 kV Bus		C	L-1/L-1	-24.23%	-26.16%	-36.39%	
VEA-VD-60	PAHRUMP_1 230 kV Bus		C	L-1/L-1	-24.31%	-26.27%	-38.56%	
VEA-VD-61	CRAZY EYE TP230 kV Bus	Line NWEST 230.0 to DESERT VIEW 230.0 Ckt 1_Line CRAZY EYE TP 230.0 to BOB TAP 230.0 Ckt 1	C	L-1/L-1	NA	NA	Not Solved	Notice NVE. On 2014 and 2017, review existing UVLS to shed loads, or operate the VEA 138 kV system in radial after first contingency to isolate potential impact on the vicinity area (Zone 183/187). On 2022, modify previous identified Crazy Eye SPS to cover this L1/L-1 event, or apply congestion management to curtail generation after one of three generators are tripped by the SPS
VEA-VD-62	DESERT VIEW 230 kV Bus		C	L-1/L-1	-23.14%	-25.03%	Not Solved	
VEA-VD-63	LTHRPWLS 138 kV Bus		C	L-1/L-1	-15.20%	-16.08%	Not Solved	
VEA-VD-64	MERCRYSW 138 kV Bus		C	L-1/L-1	-11.60%	-12.31%	Not Solved	
VEA-VD-65	MERCURY 138 kV Bus		C	L-1/L-1	-11.60%	-12.32%	Not Solved	
VEA-VD-66	NTSCANYN 138 kV Bus		C	L-1/L-1	-14.06%	-14.90%	Not Solved	
VEA-VD-67	PAHRUMP 138 kV Bus		C	L-1/L-1	-18.75%	-19.60%	Not Solved	
VEA-VD-68	PAHRUMP_1 230 kV Bus		C	L-1/L-1	-23.23%	-25.16%	Not Solved	
VEA-VD-69	RAINIER 138 kV Bus		C	L-1/L-1	-13.34%	-14.14%	Not Solved	
VEA-VD-70	STOCKADE 138 kV Bus		C	L-1/L-1	-13.54%	-14.37%	Not Solved	

Study Area: **Valley Electric Association - Summer Peak with renewables**

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-VD-71	THSNDAIR 138 kV Bus		C	L-1/L-1	-18.23%	-18.98%	Not Solved	
VEA-VD-72	VALLEYNT 138 kV Bus		C	L-1/L-1	-13.17%	-13.98%	Not Solved	
VEA-VD-73	VALLEYTP 138 kV Bus		C	L-1/L-1	-15.91%	-16.83%	Not Solved	
VEA-VD-74	VALLEYVE 138 kV Bus		C	L-1/L-1	-15.93%	-16.85%	Not Solved	
VEA-VD-75	VISTA 138 kV Bus		C	L-1/L-1	-17.87%	-18.85%	Not Solved	
VEA-VD-76	YUCCAFLT 138 kV Bus		C	L-1/L-1	-12.74%	-13.51%	Not Solved	
VEA-VD-77	CRAZY EYE TP230 kV Bus		C	L-1/L-1	NA	NA	Not Solved	
VEA-VD-78	DESERT VIEW 230 kV Bus		C	L-1/L-1	-23.14%	-25.03%	Not Solved	
VEA-VD-79	PAHRUMP_1 230 kV Bus		C	L-1/L-1	-23.23%	-25.16%	Not Solved	
VEA-VD-80	BEATTY 138 kV Bus		C	L-1/L-1	-19.90%	-20.62%	Not Solved	
VEA-VD-81	GROOM LK 138 kV Bus		C	L-1/L-1	-16.84%	-17.41%	Not Solved	
VEA-VD-82	JACKASSF 138 kV Bus		C	L-1/L-1	-18.27%	-18.92%	Not Solved	
VEA-VD-83	JOHNNIE 138 kV Bus		C	L-1/L-1	-23.23%	-24.09%	Not Solved	
VEA-VD-84	LTHRPWLS 138 kV Bus		C	L-1/L-1	-19.79%	-20.50%	Not Solved	
VEA-VD-85	MERCRYSW 138 kV Bus		C	L-1/L-1	-14.77%	-15.24%	Not Solved	

Study Area: **Valley Electric Association - Summer Peak with renewables**

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-VD-86	MERCURY 138 kV Bus	Line PAHRUMP_1 230.0 to DESERT VIEW 230.0 Ckt 1_Line PAHRUMP_1 230.0 to CRAZY EYE TP 230.0 Ckt 1	C	L-1/L-1	-14.77%	-15.25%	Not Solved	Review existing UVLS to shed VEA loads, or operate the 138 kV system in radial with two independent supplies from Amargosa and Pahrump after first contingency to isolate potential impact on the vicinity area (Zone 183/187)
VEA-VD-87	NTSCANYN 138 kV Bus		C	L-1/L-1	-18.06%	-18.69%	Not Solved	
VEA-VD-88	PAHRUMP 138 kV Bus		C	L-1/L-1	-25.04%	-25.74%	Not Solved	
VEA-VD-89	PAHRUMP_1 230 kV Bus		C	L-1/L-1	-29.57%	-31.36%	Not Solved	
VEA-VD-90	RAINIER 138 kV Bus		C	L-1/L-1	-17.04%	-17.62%	Not Solved	
VEA-VD-91	SANDY 138 kV Bus		C	L-1/L-1	-19.75%	-20.39%	Not Solved	
VEA-VD-92	STOCKADE 138 kV Bus		C	L-1/L-1	-17.30%	-17.91%	Not Solved	
VEA-VD-93	THSNDAIR 138 kV Bus		C	L-1/L-1	-24.32%	-24.89%	Not Solved	
VEA-VD-94	VALLEYNT 138 kV Bus		C	L-1/L-1	-16.82%	-17.40%	Not Solved	
VEA-VD-95	VALLEYTP 138 kV Bus		C	L-1/L-1	-20.91%	-21.67%	Not Solved	
VEA-VD-96	VALLEYVE 138 kV Bus		C	L-1/L-1	-20.93%	-21.69%	Not Solved	
VEA-VD-97	VISTA 138 kV Bus		C	L-1/L-1	-23.80%	-24.68%	Not Solved	
VEA-VD-98	YUCCAFLT 138 kV Bus		C	L-1/L-1	-16.25%	-16.79%	Not Solved	
VEA-VD-99	PAHRUMP_1 230 kV Bus		C	L-1/L-1	-29.57%	-31.36%	Not Solved	
VEA-VD-100	BEATTY 138 kV Bus		C	L-1/L-1	-19.16%	-19.84%	Not Solved	

Study Area: **Valley Electric Association - Summer Peak with renewables**

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-VD-101	GROOM LK 138 kV Bus	Line PAHRUMP_1 230.0 to DESERT VIEW 230.0 Ckt 1_Line CRAZY EYE TP 230.0 to BOB TAP 230.0 Ckt 1	C	L-1/L-1	-16.26%	-16.80%	Not Solved	Notice NVE. On 2014 and 2017, review existing UVLS to shed loads, or operate the VEA 138 kV system in radial after first contingency to isolate potential impact on the vicinity area (Zone 183/187). On 2022, modify previous identified Crazy Eye SPS to cover this L1/L-1 event, or apply congestion management to curtail generation after one of three generators are tripped by the SPS
VEA-VD-102	JACKASSF 138 kV Bus		C	L-1/L-1	-17.63%	-18.23%	Not Solved	
VEA-VD-103	JOHNNIE 138 kV Bus		C	L-1/L-1	-22.33%	-23.14%	Not Solved	
VEA-VD-104	LTHRPWLS 138 kV Bus		C	L-1/L-1	-19.06%	-19.72%	Not Solved	
VEA-VD-105	MERCRYSW 138 kV Bus		C	L-1/L-1	-14.27%	-14.71%	Not Solved	
VEA-VD-106	MERCURY 138 kV Bus		C	L-1/L-1	-14.27%	-14.72%	Not Solved	
VEA-VD-107	NTSCANYN 138 kV Bus		C	L-1/L-1	-17.42%	-18.02%	Not Solved	
VEA-VD-108	PAHRUMP 138 kV Bus		C	L-1/L-1	-24.04%	-24.69%	Not Solved	
VEA-VD-109	PAHRUMP_1 230 kV Bus		C	L-1/L-1	-28.56%	-30.31%	Not Solved	
VEA-VD-110	RAINIER 138 kV Bus		C	L-1/L-1	-16.45%	-17.00%	Not Solved	
VEA-VD-111	SANDY 138 kV Bus		C	L-1/L-1	-18.98%	-19.58%	Not Solved	
VEA-VD-112	STOCKADE 138 kV Bus		C	L-1/L-1	-16.71%	-17.28%	Not Solved	
VEA-VD-113	THSNDAIR 138 kV Bus		C	L-1/L-1	-23.35%	-23.88%	Not Solved	
VEA-VD-114	VALLEYNT 138 kV Bus		C	L-1/L-1	-16.24%	-16.79%	Not Solved	
VEA-VD-115	VALLEYTP 138 kV Bus		C	L-1/L-1	-20.12%	-20.83%	Not Solved	

Study Area: Valley Electric Association - Summer Peak with renewables

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-VD-116	VALLEYVE 138 kV Bus		C	L-1/L-1	-20.14%	-20.85%	Not Solved	
VEA-VD-117	VISTA 138 kV Bus		C	L-1/L-1	-22.86%	-23.68%	Not Solved	
VEA-VD-118	YUCCAFLT 138 kV Bus		C	L-1/L-1	-15.69%	-16.20%	Not Solved	
VEA-VD-119	CRAZY EYE TP230 kV Bus		C	L-1/L-1	NA	NA	Not Solved	
VEA-VD-120	PAHRUMP_1 230 kV Bus		C	L-1/L-1	-28.56%	-30.31%	Not Solved	
VEA-VD-121	BEATTY 138 kV Bus	Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 1 0.00_Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 2 0.00	C	T-1/T-1	-19.73%	-20.89%	Not Solved	Review existing UVLS to shed VEA loads, or operate the 138 kV system in radial with two independent supplies from Amargosa and Pahrump after first contingency to isolate potential impact on the vicinity area (Zone 183/187)
VEA-VD-122	BONDGDTP 138 kV Bus		C	T-1/T-1	-19.72%	-20.88%	Not Solved	
VEA-VD-123	CHARLSTN 138 kV Bus		C	T-1/T-1	-24.26%	-25.07%	Not Solved	
VEA-VD-124	FRENCHMN 138 kV Bus		C	T-1/T-1	-15.40%	-16.36%	Not Solved	
VEA-VD-125	GAMEBIRD 138 kV Bus		C	T-1/T-1	-24.04%	-25.04%	Not Solved	
VEA-VD-126	GROOM LK 138 kV Bus		C	T-1/T-1	-16.67%	-17.70%	Not Solved	
VEA-VD-127	JACKASSF 138 kV Bus		C	T-1/T-1	-18.11%	-19.19%	Not Solved	
VEA-VD-128	JOHNNIE 138 kV Bus		C	T-1/T-1	-23.06%	-24.33%	Not Solved	
VEA-VD-129	LTHRPWLS 138 kV Bus		C	T-1/T-1	-19.62%	-20.77%	Not Solved	
VEA-VD-130	MERCRYSW 138 kV Bus		C	T-1/T-1	-14.61%	-15.52%	Not Solved	

Study Area: Valley Electric Association - Summer Peak with renewables

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-VD-131	MERCURY 138 kV Bus		C	T-1/T-1	-14.61%	-15.53%	Not Solved	
VEA-VD-132	NTSCANYN 138 kV Bus		C	T-1/T-1	-17.89%	-18.97%	Not Solved	
VEA-VD-133	PAHRUMP 138 kV Bus		C	T-1/T-1	-24.88%	-25.96%	Not Solved	
VEA-VD-134	RAINIER 138 kV Bus		C	T-1/T-1	-16.87%	-17.90%	Not Solved	
VEA-VD-135	SANDY 138 kV Bus		C	T-1/T-1	-19.61%	-20.56%	Not Solved	
VEA-VD-136	STOCKADE 138 kV Bus		C	T-1/T-1	-17.14%	-18.19%	Not Solved	
VEA-VD-137	THSNDAIR 138 kV Bus		C	T-1/T-1	-24.16%	-25.11%	Not Solved	
VEA-VD-138	VALLEYNT 138 kV Bus		C	T-1/T-1	-16.65%	-17.68%	Not Solved	
VEA-VD-139	VALLEYTP 138 kV Bus		C	T-1/T-1	-20.74%	-21.93%	Not Solved	
VEA-VD-140	VALLEYVE 138 kV Bus		C	T-1/T-1	-20.76%	-21.96%	Not Solved	
VEA-VD-141	VISTA 138 kV Bus		C	T-1/T-1	-23.64%	-24.91%	Not Solved	
VEA-VD-142	YUCCAFLT 138 kV Bus		C	T-1/T-1	-16.08%	-17.07%	Not Solved	
VEA-VD-143	BOB TAP 230 kV Bus	Tran ELDORDO 500.0 to ELDORDO2 230.0 Ckt 1_Line MEAD S 230.0 to BOB TAP 230.0 Ckt 1	C	L-1/L-1	NA	-11.22%	Not Solved	Notice SCE. Modify Crazy Eye SPS identified in Cluster Alpha and Ivanpah-Eldorado SPS identified in GIP, or apply congestion management to curtail generation after first contingency
VEA-VD-144	ELDORDO2 230 kV Bus		C	L-1/L-1	NA	-11.07%	Not Solved	
VEA-VD-145	PAHRUMP_1 230 kV Bus		C	L-1/L-1	-1.61%	-10.36%	Not Solved	

Study Area: **Valley Electric Association - Summer Light Load & Summer Off-Peak with renewables**

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	
VEA-VD-146	DESERT VIEW 230 kV Bus	Line NWEST 230.0 to DESERT VIEW 230.0 Circuit 1	C	L-1	7.48%	3.78%		May be waived due to non-load bus by requests
VEA-VD-147	PAHRUMP_1 230 kV Bus	Line NWEST 230.0 to DESERT VIEW 230.0 Ckt 1_Line PAHRUMP_1 230.0 to CRAZY EYE TP 230.0 Ckt 1	C	L-1/L-1	15.77%	-13.14%		Develop operation procedure to prevent voltage surge on 230 kV buses prior to second contingency for light load condition, and review existing UVLS to shed VEA loads under higher load condition
VEA-VD-148	DESERT VIEW 230 kV Bus		C	L-1/L-1	19.55%	-11.42%		
VEA-VD-149	DESERT VIEW 230 kV Bus	Line NWEST 230.0 to DESERT VIEW 230.0 Ckt 1_Line CRAZY EYE TP 230.0 to BOB TAP 230.0 Ckt 1	C	L-1/L-1	NA	-10.41%		Review existing UVLS to shed VEA loads
VEA-VD-150	PAHRUMP_1 230 kV Bus		C	L-1/L-1	NA	-12.14%		
VEA-VD-151	PAHRUMP_1 230 kV Bus	Line PAHRUMP_1 230.0 to DESERT VIEW 230.0 Ckt 1_Line PAHRUMP_1 230.0 to CRAZY EYE TP 230.0 Ckt 1	C	L-1/L-1	-12.48%	-16.44%		Review existing UVLS to shed loads
VEA-VD-152	PAHRUMP_1 230 kV Bus	Line PAHRUMP_1 230.0 to DESERT VIEW 230.0 Ckt 1_Line CRAZY EYE TP 230.0 to BOB TAP 230.0 Ckt 1	C	L-1/L-1	-11.55%	-15.51%		Review existing UVLS to shed loads
VEA-VD-153	BOB TAP 230 kV Bus	Tran ELDORDO 500.0 to ELDORDO2 230.0 Ckt 1_Line MEAD S 230.0 to BOB TAP 230.0 Ckt 1	C	L-1/L-1	NA	-10.99%		Notice SCE. Modify Crazy Eye SPS identified in Cluster Alpha and Ivanpah-Eldorado SPS identified in GIP, or apply congestion management to curtail generation after first contingency
VEA-VD-154	ELDORDO2 230 kV Bus		C	L-1/L-1	NA	-10.85%		
VEA-VD-155	PAHRUMP_1 230 kV Bus		C	L-1/L-1	-0.03%	-11.51%		

Study Area: **Valley Electric Association - Summer Peak with renewables**

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-V-1	CHARLSTN 138 kV Bus	Line PAHRUMP 138.0 to GAMEBIRD 138.0 Circuit 1	B	L-1	0.88	1.00	1.00	Adjust NLTC of Amargosa 230/138 kV transformer if doable. If not, new Charleston-Vista 138 kV line will fix it
VEA-V-2	GAMEBIRD 138 kV Bus		B	L-1	0.89	1.00	0.99	
VEA-V-3	THSNDAIR 138 kV Bus		B	L-1	0.89	1.00	0.99	
VEA-V-4	CHARLSTN 138 kV Bus	Brkr Fail PAHRUMP-VISTA 138 & PAHRUMP-GAMEBIRD 138 1.000 CatC BKR Flt	C	Breaker Failure	0.88	0.92	0.91	Collaborate with NVE to develop SPS to shed load prior to generation coming on line in VEA, or re-arrange bay positions for the two 138 kV lines at Pahrump 138 kV sub.
VEA-V-5	GAMEBIRD 138 kV Bus		C	Breaker Failure	0.89	0.92	0.91	
VEA-V-6	GAMEBIRD_PST138 kV Bus		C	Breaker Failure	0.89	0.92	0.90	
VEA-V-7	THSNDAIR 138 kV Bus		C	Breaker Failure	0.89	0.92	0.90	
VEA-V-8	AMARGOSA 138 kV Bus	Line NWEST 230.0 to DESERT VIEW 230.0 Ckt 1_Line PAHRUMP_1 230.0 to CRAZY EYE TP 230.0 Ckt 1	C	L-1/L-1	0.94	0.94	0.89	Review existing UVLS to shed VEA loads, or operate the 138 kV system in radial with two independent supplies from Amargosa and Pahrump after first contingency to isolate potential impact on the vicinity area (Zone 183/187)
VEA-V-9	BEATTY 138 kV Bus		C	L-1/L-1	0.86	0.85	0.75	
VEA-V-10	BONDGDTP 138 kV Bus		C	L-1/L-1	0.86	0.85	0.75	
VEA-V-11	CHARLSTN 138 kV Bus		C	L-1/L-1	0.82	0.82	0.69	
VEA-V-12	DESERT VIEW 230 kV Bus		C	L-1/L-1	0.76	0.75	0.63	
VEA-V-13	FRENCHMN 138 kV Bus		C	L-1/L-1	0.89	0.88	0.81	
VEA-V-14	GAMEBIRD 138 kV Bus		C	L-1/L-1	0.83	0.82	0.69	
VEA-V-15	GROOM LK 138 kV Bus		C	L-1/L-1	0.88	0.88	0.80	
VEA-V-16	IND SPR 138 kV Bus		C	L-1/L-1	0.94	0.94	0.90	
VEA-V-17	IS TAP 138 kV Bus		C	L-1/L-1	0.94	0.94	0.90	
VEA-V-18	JACKASSF 138 kV Bus		C	L-1/L-1	0.87	0.86	0.77	
VEA-V-19	JOHNNIE 138 kV Bus		C	L-1/L-1	0.84	0.83	0.71	
VEA-V-20	LTHRPWLS 138 kV Bus		C	L-1/L-1	0.86	0.85	0.75	
VEA-V-21	MERCRYSW 138 kV Bus		C	L-1/L-1	0.89	0.89	0.82	
VEA-V-22	MERCURY 138 kV Bus		C	L-1/L-1	0.89	0.89	0.82	
VEA-V-23	NTSCANYN 138 kV Bus		C	L-1/L-1	0.87	0.87	0.78	
VEA-V-24	PAHRUMP 138 kV Bus		C	L-1/L-1	0.83	0.82	0.69	
VEA-V-25	PAHRUMP_1 230 kV Bus		C	L-1/L-1	0.75	0.74	0.62	
VEA-V-26	RAINIER 138 kV Bus		C	L-1/L-1	0.88	0.88	0.80	
VEA-V-27	SANDY 138 kV Bus		C	L-1/L-1	0.86	0.85	0.76	

Study Area: **Valley Electric Association - Summer Peak with renewables**

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-V-28	THSNDAIR 138 kV Bus		C	L-1/L-1	0.83	0.82	0.69	
VEA-V-29	VALLEYNT 138 kV Bus		C	L-1/L-1	0.88	0.88	0.80	
VEA-V-30	VALLEYTP 138 kV Bus		C	L-1/L-1	0.86	0.85	0.74	
VEA-V-31	VALLEYVE 138 kV Bus		C	L-1/L-1	0.86	0.85	0.74	
VEA-V-32	VISTA 138 kV Bus		C	L-1/L-1	0.84	0.82	0.70	
VEA-V-33	YUCCAFLT 138 kV Bus		C	L-1/L-1	0.89	0.88	0.81	
VEA-V-34	DESERT VIEW 230 kV Bus		C	L-1/L-1	0.76	0.75	0.63	
VEA-V-35	PAHRUMP_1 230 kV Bus		C	L-1/L-1	0.75	0.74	0.62	
VEA-V-36	BEATTY 138 kV Bus	Line NWEST 230.0 to DESERT VIEW 230.0 Ckt 1_Line CRAZY EYE TP 230.0 to BOB TAP 230.0 Ckt 1	C	L-1/L-1	0.87	0.86	Not Solved	Notice NVE. On 2014 and 2017, review existing UVLS to shed loads, or operate the VEA 138 kV system in radial after first contingency to isolate potential impact on the vicinity area (Zone 183/187). On 2022, modify previous identified Crazy Eye SPS to cover this L1/L-1 event, or apply congestion management to curtail generation after one of three generators are tripped by the SPS
VEA-V-37	BONDGDTP 138 kV Bus		C	L-1/L-1	0.87	0.86	Not Solved	
VEA-V-38	CHARLSTN 138 kV Bus		C	L-1/L-1	0.83	0.83	Not Solved	
VEA-V-39	CRAZY EYE TP230 kV Bus		C	L-1/L-1	0.76	0.76	Not Solved	
VEA-V-40	DESERT VIEW 230 kV Bus		C	L-1/L-1	0.77	0.76	Not Solved	
VEA-V-41	FRENCHMN 138 kV Bus		C	L-1/L-1	0.90	0.89	Not Solved	
VEA-V-42	GAMEBIRD 138 kV Bus		C	L-1/L-1	0.84	0.83	Not Solved	
VEA-V-43	GROOM LK 138 kV Bus		C	L-1/L-1	0.89	0.88	Not Solved	
VEA-V-44	JACKASSF 138 kV Bus		C	L-1/L-1	0.88	0.87	Not Solved	
VEA-V-45	JOHNNIE 138 kV Bus		C	L-1/L-1	0.85	0.84	Not Solved	
VEA-V-46	LTHRPWLS 138 kV Bus		C	L-1/L-1	0.87	0.86	Not Solved	
VEA-V-47	MERCRYSW 138 kV Bus		C	L-1/L-1	0.90	0.89	Not Solved	
VEA-V-48	MERCURY 138 kV Bus		C	L-1/L-1	0.90	0.89	Not Solved	
VEA-V-49	NTSCANYN 138 kV Bus		C	L-1/L-1	0.88	0.87	Not Solved	
VEA-V-50	PAHRUMP 138 kV Bus		C	L-1/L-1	0.84	0.83	Not Solved	
VEA-V-51	PAHRUMP_1 230 kV Bus		C	L-1/L-1	0.76	0.75	Not Solved	
VEA-V-52	RAINIER 138 kV Bus		C	L-1/L-1	0.89	0.88	Not Solved	
VEA-V-53	SANDY 138 kV Bus		C	L-1/L-1	0.87	0.86	Not Solved	
VEA-V-54	THSNDAIR 138 kV Bus		C	L-1/L-1	0.84	0.83	Not Solved	
VEA-V-55	VALLEYNT 138 kV Bus		C	L-1/L-1	0.89	0.88	Not Solved	
VEA-V-56	VALLEYTP 138 kV Bus		C	L-1/L-1	0.87	0.86	Not Solved	
VEA-V-57	VALLEYVE 138 kV Bus		C	L-1/L-1	0.87	0.86	Not Solved	
VEA-V-58	VISTA 138 kV Bus		C	L-1/L-1	0.85	0.83	Not Solved	

Study Area: **Valley Electric Association - Summer Peak with renewables**

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-V-59	YUCCAFLT 138 kV Bus		C	L-1/L-1	0.89	0.89	Not Solved	
VEA-V-60	CRAZY EYE TP230 kV Bus		C	L-1/L-1	0.76	0.76	Not Solved	
VEA-V-61	DESERT VIEW 230 kV Bus		C	L-1/L-1	0.77	0.76	Not Solved	
VEA-V-62	PAHRUMP_1 230 kV Bus		C	L-1/L-1	0.76	0.75	Not Solved	
VEA-V-63	BEATTY 138 kV Bus	Line PAHRUMP_1 230.0 to DESERT VIEW 230.0 Ckt 1_Line PAHRUMP_1 230.0 to CRAZY EYE TP 230.0 Ckt 1	C	L-1/L-1	0.82	0.82	Not Solved	Review existing UVLS to shed VEA loads, or operate the 138 kV system in radial with two independent supplies from Amargosa and Pahrump after first contingency to isolate potential impact on the vicinity area (Zone 183/187)
VEA-V-64	BONDGDTP 138 kV Bus		C	L-1/L-1	0.82	0.82	Not Solved	
VEA-V-65	CHARLSTN 138 kV Bus		C	L-1/L-1	0.77	0.77	Not Solved	
VEA-V-66	FRENCHMN 138 kV Bus		C	L-1/L-1	0.86	0.86	Not Solved	
VEA-V-67	GAMEBIRD 138 kV Bus		C	L-1/L-1	0.78	0.77	Not Solved	
VEA-V-68	GROOM LK 138 kV Bus		C	L-1/L-1	0.85	0.85	Not Solved	
VEA-V-69	JACKASSF 138 kV Bus		C	L-1/L-1	0.84	0.83	Not Solved	
VEA-V-70	JOHNNIE 138 kV Bus		C	L-1/L-1	0.79	0.78	Not Solved	
VEA-V-71	LTHRPWLS 138 kV Bus		C	L-1/L-1	0.83	0.82	Not Solved	
VEA-V-72	MERCRYSW 138 kV Bus		C	L-1/L-1	0.87	0.86	Not Solved	
VEA-V-73	MERCURY 138 kV Bus		C	L-1/L-1	0.87	0.86	Not Solved	
VEA-V-74	NTSCANYN 138 kV Bus		C	L-1/L-1	0.84	0.84	Not Solved	
VEA-V-75	PAHRUMP 138 kV Bus		C	L-1/L-1	0.78	0.77	Not Solved	
VEA-V-76	PAHRUMP_1 230 kV Bus		C	L-1/L-1	0.70	0.69	Not Solved	
VEA-V-77	RAINIER 138 kV Bus		C	L-1/L-1	0.85	0.85	Not Solved	
VEA-V-78	SANDY 138 kV Bus		C	L-1/L-1	0.82	0.81	Not Solved	
VEA-V-79	THSNDAIR 138 kV Bus		C	L-1/L-1	0.78	0.77	Not Solved	
VEA-V-80	VALLEYNT 138 kV Bus		C	L-1/L-1	0.85	0.85	Not Solved	
VEA-V-81	VALLEYTP 138 kV Bus		C	L-1/L-1	0.82	0.81	Not Solved	
VEA-V-82	VALLEYVE 138 kV Bus		C	L-1/L-1	0.82	0.81	Not Solved	
VEA-V-83	VISTA 138 kV Bus		C	L-1/L-1	0.79	0.78	Not Solved	
VEA-V-84	YUCCAFLT 138 kV Bus		C	L-1/L-1	0.86	0.85	Not Solved	
VEA-V-85	PAHRUMP_1 230 kV Bus		C	L-1/L-1	0.70	0.69	Not Solved	
VEA-V-86	BEATTY 138 kV Bus		C	L-1/L-1	0.83	0.82	Not Solved	
VEA-V-87	BONDGDTP 138 kV Bus		C	L-1/L-1	0.83	0.82	Not Solved	
VEA-V-88	CHARLSTN 138 kV Bus		C	L-1/L-1	0.78	0.78	Not Solved	
VEA-V-89	CRAZY EYE TP230 kV Bus		C	L-1/L-1	0.71	0.70	Not Solved	

Study Area: **Valley Electric Association - Summer Peak with renewables**

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-V-90	FRENCHMN 138 kV Bus	Line PAHRUMP_1 230.0 to DESERT VIEW 230.0 Ckt 1_Line CRAZY EYE TP 230.0 to BOB TAP 230.0 Ckt 1	C	L-1/L-1	0.87	0.87	Not Solved	Notice NVE. On 2014 and 2017, review existing UVLS to shed loads, or operate the VEA 138 kV system in radial after first contingency to isolate potential impact on the vicinity area (Zone 183/187). On 2022, modify previous identified Crazy Eye SPS to cover this L1/L-1 event, or apply congestion management to curtail generation after one of three generators are tripped by the SPS
VEA-V-91	GAMEBIRD 138 kV Bus		C	L-1/L-1	0.79	0.78	Not Solved	
VEA-V-92	GROOM LK 138 kV Bus		C	L-1/L-1	0.86	0.86	Not Solved	
VEA-V-93	JACKASSF 138 kV Bus		C	L-1/L-1	0.84	0.84	Not Solved	
VEA-V-94	JOHNNIE 138 kV Bus		C	L-1/L-1	0.80	0.79	Not Solved	
VEA-V-95	LTHRPWLS 138 kV Bus		C	L-1/L-1	0.83	0.83	Not Solved	
VEA-V-96	MERCRYSW 138 kV Bus		C	L-1/L-1	0.87	0.87	Not Solved	
VEA-V-97	MERCURY 138 kV Bus		C	L-1/L-1	0.87	0.87	Not Solved	
VEA-V-98	NTSCANYN 138 kV Bus		C	L-1/L-1	0.85	0.84	Not Solved	
VEA-V-99	PAHRUMP 138 kV Bus		C	L-1/L-1	0.79	0.78	Not Solved	
VEA-V-100	PAHRUMP_1 230 kV Bus		C	L-1/L-1	0.71	0.70	Not Solved	
VEA-V-101	RAINIER 138 kV Bus		C	L-1/L-1	0.86	0.85	Not Solved	
VEA-V-102	SANDY 138 kV Bus		C	L-1/L-1	0.83	0.82	Not Solved	
VEA-V-103	THSNDAIR 138 kV Bus		C	L-1/L-1	0.79	0.78	Not Solved	
VEA-V-104	VALLEYNT 138 kV Bus		C	L-1/L-1	0.86	0.86	Not Solved	
VEA-V-105	VALLEYTP 138 kV Bus		C	L-1/L-1	0.82	0.82	Not Solved	
VEA-V-106	VALLEYVE 138 kV Bus		C	L-1/L-1	0.82	0.82	Not Solved	
VEA-V-107	VISTA 138 kV Bus		C	L-1/L-1	0.80	0.79	Not Solved	
VEA-V-108	YUCCAFLT 138 kV Bus		C	L-1/L-1	0.86	0.86	Not Solved	
VEA-V-109	CRAZY EYE TP230 kV Bus		C	L-1/L-1	0.71	0.70	Not Solved	
VEA-V-110	PAHRUMP_1 230 kV Bus		C	L-1/L-1	0.71	0.70	Not Solved	
VEA-V-111	BEATTY 138 kV Bus	Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 1 0.00_Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 2 0.00	C	T-1/T-1	0.82	0.81	Not Solved	Review existing UVLS to shed VEA loads, or operate the 138 kV system in radial with two independent supplies from Amargosa and Pahrump after first contingency to isolate potential impact on the vicinity area (Zone 183/187)
VEA-V-112	BONDGDTP 138 kV Bus		C	T-1/T-1	0.83	0.81	Not Solved	
VEA-V-113	CHARLSTN 138 kV Bus		C	T-1/T-1	0.77	0.77	Not Solved	
VEA-V-114	FRENCHMN 138 kV Bus		C	T-1/T-1	0.86	0.86	Not Solved	
VEA-V-115	GAMEBIRD 138 kV Bus		C	T-1/T-1	0.78	0.77	Not Solved	
VEA-V-116	GROOM LK 138 kV Bus		C	T-1/T-1	0.86	0.85	Not Solved	
VEA-V-117	JACKASSF 138 kV Bus		C	T-1/T-1	0.84	0.83	Not Solved	
VEA-V-118	JOHNNIE 138 kV Bus		C	T-1/T-1	0.80	0.78	Not Solved	
VEA-V-119	LTHRPWLS 138 kV Bus		C	T-1/T-1	0.83	0.82	Not Solved	
VEA-V-120	MERCRYSW 138 kV Bus		C	T-1/T-1	0.87	0.86	Not Solved	

Study Area: **Valley Electric Association - Summer Peak with renewables**

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-V-121	MERCURY 138 kV Bus		C	T-1/T-1	0.87	0.86	Not Solved	
VEA-V-122	NTSCANYN 138 kV Bus		C	T-1/T-1	0.84	0.83	Not Solved	
VEA-V-123	PAHRUMP 138 kV Bus		C	T-1/T-1	0.78	0.77	Not Solved	
VEA-V-124	RAINIER 138 kV Bus		C	T-1/T-1	0.85	0.85	Not Solved	
VEA-V-125	SANDY 138 kV Bus		C	T-1/T-1	0.82	0.81	Not Solved	
VEA-V-126	THSNDAIR 138 kV Bus		C	T-1/T-1	0.78	0.77	Not Solved	
VEA-V-127	VALLEYNT 138 kV Bus		C	T-1/T-1	0.86	0.85	Not Solved	
VEA-V-128	VALLEYTP 138 kV Bus		C	T-1/T-1	0.82	0.81	Not Solved	
VEA-V-129	VALLEYVE 138 kV Bus		C	T-1/T-1	0.82	0.81	Not Solved	
VEA-V-130	VISTA 138 kV Bus		C	T-1/T-1	0.79	0.77	Not Solved	
VEA-V-131	YUCCAFLT 138 kV Bus		C	T-1/T-1	0.86	0.85	Not Solved	
VEA-V-132	CRAZY EYE TP230 kV Bus	Tran ELDORDO 500.0 to ELDORDO2 230.0 Ckt 1_Line MEAD S 230.0 to BOB TAP 230.0 Ckt 1	C	T-1/L-1	0.98	0.89	Not Solved	Notice SCE. Modify Crazy Eye SPS identified in Cluster Alpha and Ivanpah-Eldorado SPS identified in GIP, or apply congestion management to curtail generation after first contingency
VEA-V-133	PAHRUMP_1 230 kV Bus		C	T-1/L-1	0.98	0.90	Not Solved	

Study Area: **Valley Electric Association - Summer Light Load & Summer Off-Peak with renewables**

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	
VEA-V-134	DESERT VIEW 230 kV Bus	Line NWEST 230.0 to DESERT VIEW 230.0 Ckt 1_Line PAHRUMP_1 230.0 to CRAZY EYE TP 230.0 Ckt 1	C	L-1/L-1	1.18	0.90		Develop operation procedure to prevent voltage surge on 230 kV buses prior to second contingency for light load condition, and review existing UVLS to shed VEA loads under higher load condition
VEA-V-135	PAHRUMP_1 230 kV Bus		C	L-1/L-1	1.16	0.89		
VEA-V-136	PAHRUMP_1 230 kV Bus	Line PAHRUMP_1 230.0 to DESERT VIEW 230.0 Ckt 1_Line PAHRUMP_1 230.0 to CRAZY EYE TP 230.0 Ckt 1	C	L-1/L-1	0.88	0.86		May be waived by request due to non-load bus while reviewing existing UVLS to shed loads
VEA-V-137	CRAZY EYE TP230 kV Bus	Line PAHRUMP_1 230.0 to DESERT VIEW 230.0 Ckt 1_Line CRAZY EYE TP 230.0 to BOB TAP 230.0 Ckt 1	C	L-1/L-1	NA	0.87		May be waived by request due to non-load bus while reviewing existing UVLS to shed loads
VEA-V-138	PAHRUMP_1 230 kV Bus		C	L-1/L-1	0.89	0.87		

Study Area: **Valley Electric Association - Summer Peak with renewables**

Transient Stability

ID	Contingency	Category	Category Description	Transient Stability Performance			Potential Mitigation Solutions
				2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-TS-1	Crazy Eye Tap-Bob Tap 230 kV line is out with system adjustment to trip one unit at Crazy Eye, followed by a 3PH fault at Pahrump 230 kV bus that results in Pahrump-Desert View 230 kV line tripped and 2nd generator tripped by SPS	C	L-1/L-1	NA	NA	Highest voltage dip: 12.8% Lowest Frequency: 59.455	modify previous identified Crazy Eye SPS to cover this L1/L-1 event, or apply congestion management to curtail generation after one of three generators are tripped by the SPS
VEA-TS-2	Pahrump-Desert View 230 kV line is out without system adjustemnt, foollowed by a 3PH fault at Crazy Eye 230 kV bus, that results in Crazy Eye-Bob Tap 230 kV line tripped and 2 units tripped out by SPS	C	L-1/L-1	NA	NA	Lowest Frequency: 59.54	modify previous identified Crazy Eye SPS to cover this L1/L-1 event, or apply congestion management to curtail generation after one of three generators are tripped by the SPS

Study Area: **Valley Electric Association - Summer Light Load & Summer Off-Peak with renewables**

Transient Stability

ID	Contingency	Category	Category Description	Transient Stability Performance			Potential Mitigation Solutions
				2014 Summer Light Load	2017 Summer Off-Peak	N/A	

No transient stability issues identified.

Study Area: **Valley Electric Association - Summer Peak with renewables**

Post-Transient Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No post-transient thermal overloads identified.

Study Area: **Valley Electric Association - Summer Light Load & Summer Off-Peak with renewables**

Post-Transient Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Summer Off-Peak	N/A	

No post-transient thermal overloads identified.

Study Area: **Valley Electric Association - Summer Peak with renewables**

Post-Transient Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-PVD-1	COLDCREK 138.0	Pahrump-Desert View 230 kV line is out without system adjustemnt, followed by a 3PH fault at Crazy Eye 230 kV bus, that results in Crazy Eye-Bob Tap 230 kV line tripped and 1 unit tripped out by SPS	C	L-1/L-1	NA	NA	10	modify previous identified Crazy Eye SPS to cover this L1/L-1 event, or apply congestion management to curtail generation after one of three generators are tripped by the SPS
VEA-PVD-2	FRENCHMN 138.0		C	L-1/L-1	NA	NA	18.4	
VEA-PVD-3	GROOM LK 138.0		C	L-1/L-1	NA	NA	18.6	
VEA-PVD-4	IND SPR 138.0		C	L-1/L-1	NA	NA	13.1	
VEA-PVD-5	IS TAP 138.0		C	L-1/L-1	NA	NA	13.1	
VEA-PVD-6	JACKASSF 138.0		C	L-1/L-1	NA	NA	19.2	
VEA-PVD-7	MERCRYSW 138.0		C	L-1/L-1	NA	NA	18.2	
VEA-PVD-8	MERCURY 138.0		C	L-1/L-1	NA	NA	18.2	
VEA-PVD-9	NTSCANYN 138.0		C	L-1/L-1	NA	NA	19.1	
VEA-PVD-10	RADAR 138.0		C	L-1/L-1	NA	NA	12.7	
VEA-PVD-11	RAINIER 138.0		C	L-1/L-1	NA	NA	18.6	
VEA-PVD-12	STOCKADE 138.0		C	L-1/L-1	NA	NA	18.7	
VEA-PVD-13	VALLEYNT 138.0		C	L-1/L-1	NA	NA	18.6	
VEA-PVD-14	YUCCAFLT 138.0		C	L-1/L-1	NA	NA	18.6	
VEA-PVD-15	PAHRUMP1 230.0		C	L-1/L-1	NA	NA	8.9	
VEA-PVD-16	AMARGOSA 138.0		C	L-1/L-1	NA	NA	15.1	
VEA-PVD-17	BEATTY 138.0		C	L-1/L-1	NA	NA	19.8	
VEA-PVD-18	BONDGDTP 138.0		C	L-1/L-1	NA	NA	19.8	
VEA-PVD-19	LTHRPWLS 138.0		C	L-1/L-1	NA	NA	19.7	
VEA-PVD-20	PAHRUMP 138.0		C	L-1/L-1	NA	NA	11.8	

Study Area: **Valley Electric Association - Summer Peak with renewables**

Post-Transient Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-PVD-21	SANDY 138.0		C	L-1/L-1	NA	NA	16.7	
VEA-PVD-22	VALLEYVE 138.0		C	L-1/L-1	NA	NA	19.2	
VEA-PVD-23	VALLEYTP 138.0		C	L-1/L-1	NA	NA	19.2	
VEA-PVD-24	VISTA 138.0		C	L-1/L-1	NA	NA	15.1	
VEA-PVD-25	JOHNNIE 138.0		C	L-1/L-1	NA	NA	16.2	
VEA-PVD-26	GAMEBIRD 138.0		C	L-1/L-1	NA	NA	14.2	
VEA-PVD-27	GAMEBIRD 138.0		C	L-1/L-1	NA	NA	13.7	
VEA-PVD-28	THSNDAIR 138.0		C	L-1/L-1	NA	NA	14.1	
VEA-PVD-29	CHARLSTN 138.0		C	L-1/L-1	NA	NA	14.6	

Study Area: **Valley Electric Association - Summer Light Load & Summer Off-Peak with renewables**

Post-Transient 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 post-transient voltage deviations identified.

Study Area: **Valley Electric Association - with renewables**

Single Contingency Load Drop

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

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

Study Area: **Valley Electric Association - Summer Peak with renewables**

Single Source Substation with more than 100 MW Load

ID	Substation	Load Served (MW)			Potential Mitigation Solutions
		2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No single source substation with more than 100 MW Load