2015-2016 ISO Reliability Assessment - Preliminary Study Results

Study Area: Valley Electric Association

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)								Potential Mitigation Solutions
					2017 Summer Peak	2020 Summer Peak	2025 Summer Peak	2017 Summer Off-Peak	2020 Summer Light Load	N/A	N/A	N/A	
VEA-T-1	19012 MEAD S 230 189040 BOB SS 230 1	Tran ELDORDO 500.00 to ELDORDO2 230.00 Circuit 5ELDOR 5T 13.80_	P1	N-1	< 90	< 90	< 90	< 90	< 90				Add T-1 gen tripping as part of Ivanpah RAS
VEA-T-2	189000 PAHRUMP 230 189007 PAHRUMP 138 1	P4.3-6_PAHRUMP 138/230kV Tran Bnk. #2 & PAHRUMP-INNOVATION 230	P4	Breaker Failure	< 90	< 90	100.47	< 90	< 90				Short-term emergency rating or rely on future generation in VEA or automatic load transfer SPS
VEA-T-3	18003 AMARGOSA 230 189001 AMARGOSA 138 1	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	< 90	115.58	114.10	< 90	< 90				Existing UVLS or operational action plan (Switching after N-1)
VEA-T-4	18003 AMARGOSA 230 189001 AMARGOSA 138 1	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_	P6	N-1-1	147.42	N/A	N/A	< 90	N/A				Existing UVLS or operational action plan (Switching after N-1)
VEA-T-5	18003 AMARGOSA 230 189001 AMARGOSA 138 1	Line NWEST 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	113.17	110.87	N/A	< 90				Existing UVLS or operational action plan (Switching after N-1)
VEA-T-6	18003 AMARGOSA 230 189001 AMARGOSA 138 1	Line NWEST 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_	P6	N-1-1	142.34	N/A	N/A	< 90	N/A				Existing UVLS or operational action plan (Switching after N-1)
VEA-T-7	18003 AMARGOSA 230 189001 AMARGOSA 138 1	Line PAHRUMP 230.0 to INNOVATION 230.0 Circuit 1_ and Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_	P6	N-1-1	120.95	N/A	N/A	< 90	N/A				Existing UVLS or operational action plan (Switching after N-1)
VEA-T-8	18003 AMARGOSA 230 189001 AMARGOSA 138 1	Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_ and Line PAHRUMP 230.0 to INNOVATION 230.0 Circuit 1_	P6	N-1-1	120.92	N/A	N/A	< 90	N/A				Existing UVLS or operational action plan (Switching after N-1)

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)								Potential Mitigation Solutions
					2017 Summer Peak	2020 Summer Peak	2025 Summer Peak	2017 Summer Off-Peak	2020 Summer Light Load	N/A	N/A	N/A	
VEA-T-9	18003 AMARGOSA 230 189001 AMARGOSA 138 1	Tran PAHRUMP 230.00 to PAHRUMP 138.00 Circuit 1 0.00_ and Tran PAHRUMP 230.00 to PAHRUMP 138.00 Circuit 2 0.00_	P6	N-1-1	118.62	92.31	< 90	< 90	< 90				Existing UVLS or operational action plan (Switching after N-1)
VEA-T-10	189000 PAHRUMP 230 189007 PAHRUMP 138 1 or 2	Line AMARGOSA 138.0 to SANDY 138.0 Circuit 1_ and Tran PAHRUMP 230.00 to PAHRUMP 138.00 Circuit 2 or 1	P6	N-1-1	100.85	< 90	95.42	< 90	< 90				Existing UVLS or operational action plan (Switching after N-1)
VEA-T-11	189000 PAHRUMP 230 189007 PAHRUMP 138 1 or 2	Line INNOVATION 138.0 to MERCRYSW 138.0 Circuit 1_ and Tran PAHRUMP 230.00 to PAHRUMP 138.00 Circuit 2 or 1	P6	N-1-1	95.44	< 90	105.05	< 90	< 90				Existing UVLS or operational action plan (Switching after N-1)
VEA-T-12	189000 PAHRUMP 230 189007 PAHRUMP 138 1 or 2	Tran INNOVATION 230.00 to INNOVATION 138.00 Circuit 1 0.00_ and Tran PAHRUMP 230.00 to PAHRUMP 138.00 Circuit 2 or 1	P6	N-1-1	95.39	< 90	105.01	< 90	< 90				Existing UVLS or operational action plan (Switching after N-1)
VEA-T-13	18084 NWEST 138 189101 MERCRYSW 138 (several sections)	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	122.88	147.41	N/A	< 90				Existing UVLS or operational action plan (Switching after N-1)
VEA-T-14	18084 NWEST 138 189101 MERCRYSW 138 (several sections)	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_	P6	N-1-1	134.47	N/A	N/A	< 90	N/A				Existing UVLS or operational action plan (Switching after N-1)
VEA-T-15	18084 NWEST 138 189101 MERCRYSW 138 (several sections)	Line NWEST 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	119.64	141.22	N/A	< 90				Existing UVLS or operational action plan (Switching after N-1)
VEA-T-16	18084 NWEST 138 189101 MERCRYSW 138 (several sections)	Line NWEST 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_	P6	N-1-1	132.53	N/A	N/A	< 90	N/A				Existing UVLS or operational action plan (Switching after N-1)
VEA-T-17	18084 NWEST 138 189101 MERCRYSW 138 (several sections)	Line NWEST 230.0 to DESERT VIEW 230.0 Circuit 1__63 and Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_	P6	N-1-1	132.53	N/A	N/A	< 90	N/A				Existing UVLS or operational action plan (Switching after N-1)

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 Summer Off-Peak	2020 Summer Light Load	N/A	N/A	N/A	
VEA-VD-1	CHARLSTN 138 kV	Line GAMEBIRD 138.0 to PAHRUMP 138.0 Circuit 1_	P1	N-1	8.056	< 5	< 5	< 5	< 5				Dynamic VAR support or exception
VEA-VD-2	DESERT VIEW 230 kV	Line NWEST 230.0 to DESERT VIEW 230.0 Circuit 1_	P1	N-1	< 5	< 5	< 5	< 5	-6.764				Dynamic VAR support or exception
VEA-VD-3	GAMEBIRD 138 kV	Line GAMEBIRD 138.0 to PAHRUMP 138.0 Circuit 1_	P1	N-1	7.97	< 5	< 5	< 5	< 5				Dynamic VAR support or exception
VEA-VD-4	PAHRUMP 230 kV	Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P1	N-1	< 5	< 5	6.895	< 5	< 5				Dynamic VAR support or exception
VEA-VD-5	PAHRUMP 230 kV	Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_	P1	N-1	5.072	< 5	< 5	< 5	< 5				Dynamic VAR support or exception
VEA-VD-6	SANDY 138 kV	Line GAMEBIRD 138.0 to PAHRUMP 138.0 Circuit 1_	P1	N-1	5.677	< 5	< 5	< 5	< 5				Dynamic VAR support or exception
VEA-VD-7	THSNDAIR 138 kV	Line GAMEBIRD 138.0 to PAHRUMP 138.0 Circuit 1_	P1	N-1	8.018	< 5	< 5	< 5	< 5				Dynamic VAR support or exception
VEA-VD-8	BEATTY 138 kV	Line NWEST 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	14.301	19.815	N/A	< 10				Existing UVLS or operational action plan (Switching after N-1)
VEA-VD-9	BEATTY 138 kV	Line NWEST 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_	P6	N-1-1	13.217	N/A	N/A	< 10	N/A				Existing UVLS or operational action plan (Switching after N-1)
VEA-VD-10	CHARLSTN 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	17.08	22.372	N/A	< 10				Existing UVLS or operational action plan (Switching after N-1)
VEA-VD-11	CHARLSTN 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_	P6	N-1-1	15.515	N/A	N/A	< 10	N/A				Existing UVLS or operational action plan (Switching after N-1)
VEA-VD-12	DESERT VIEW 230 kV	Line NWEST 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	21.087	26.418	N/A	-10.363				Existing UVLS or operational action plan (Switching after N-1)
VEA-VD-13	DESERT VIEW 230 kV	Line NWEST 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_	P6	N-1-1	19.984	N/A	N/A	15.085	N/A				Existing UVLS or operational action plan (Switching after N-1)
VEA-VD-14	FRENCH-FLAT 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	14.398	20.507	N/A	< 10				Existing UVLS or operational action plan (Switching after N-1)
VEA-VD-15	FRENCH-FLAT 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_	P6	N-1-1	13.465	N/A	N/A	< 10	N/A				Existing UVLS or operational action plan (Switching after N-1)

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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 Summer Off-Peak	2020 Summer Light Load	N/A	N/A	N/A	
VEA-VD-16	GAMEBIRD 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	16.935	22.076	N/A	< 10				Existing UVLS or operational action plan (Switching after N-1)
VEA-VD-17	GAMEBIRD 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_	P6	N-1-1	15.299	N/A	N/A	< 10	N/A				Existing UVLS or operational action plan (Switching after N-1)
VEA-VD-18	IND SPR 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	< 10	11.899	N/A	< 10				Existing UVLS or operational action plan (Switching after N-1)
VEA-VD-19	JACKASSF 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	15.023	21.134	N/A	< 10				Existing UVLS or operational action plan (Switching after N-1)
VEA-VD-20	JACKASSF 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_	P6	N-1-1	14.04	N/A	N/A	< 10	N/A				Existing UVLS or operational action plan (Switching after N-1)
VEA-VD-21	JOHNNIE 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	16.735	22.259	N/A	< 10				Existing UVLS or operational action plan (Switching after N-1)
VEA-VD-22	JOHNNIE 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_	P6	N-1-1	15.642	N/A	N/A	< 10	N/A				Existing UVLS or operational action plan (Switching after N-1)
VEA-VD-23	LTHRPWLS 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	15.464	21.552	N/A	< 10				Existing UVLS or operational action plan (Switching after N-1)
VEA-VD-24	LTHRPWLS 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_	P6	N-1-1	14.448	N/A	N/A	< 10	N/A				Existing UVLS or operational action plan (Switching after N-1)
VEA-VD-25	MERC-DIST 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	14.084	20.006	N/A	< 10				Existing UVLS or operational action plan (Switching after N-1)
VEA-VD-26	MERC-DIST 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_	P6	N-1-1	13.175	N/A	N/A	< 10	N/A				Existing UVLS or operational action plan (Switching after N-1)

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 Summer Off-Peak	2020 Summer Light Load	N/A	N/A	N/A	
VEA-VD-27	PAHRUMP 230 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	22.546	28.695	N/A	-8.273				Existing UVLS or operational action plan (Switching after N-1)
VEA-VD-28	PAHRUMP 230 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_	P6	N-1-1	20.284	N/A	N/A	14.327	N/A				Existing UVLS or operational action plan (Switching after N-1)
VEA-VD-29	RADAR 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	< 10	11.44	N/A	< 10				Existing UVLS or operational action plan (Switching after N-1)
VEA-VD-30	SANDY 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	13.718	17.743	N/A	< 10				Existing UVLS or operational action plan (Switching after N-1)
VEA-VD-31	SANDY 138 kV	Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_ and Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_	P6	N-1-1	11.207	N/A	N/A	< 10	N/A				Existing UVLS or operational action plan (Switching after N-1)
VEA-VD-32	STOCK-WASH 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	14.944	21.058	N/A	< 10				Existing UVLS or operational action plan (Switching after N-1)
VEA-VD-33	STOCK-WASH 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_	P6	N-1-1	13.967	N/A	N/A	< 10	N/A				Existing UVLS or operational action plan (Switching after N-1)
VEA-VD-34	THSNDAIR 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_	P6	N-1-1	15.425	N/A	N/A	< 10	N/A				Existing UVLS or operational action plan (Switching after N-1)
VEA-VD-35	THSNDAIR 138 kV	Line NWEST 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	15.673	20.424	N/A	< 10				Existing UVLS or operational action plan (Switching after N-1)
VEA-VD-36	TWEEZER 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	14.507	20.591	N/A	< 10				Existing UVLS or operational action plan (Switching after N-1)
VEA-VD-37	TWEEZER 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_	P6	N-1-1	13.565	N/A	N/A	< 10	N/A				Existing UVLS or operational action plan (Switching after N-1)
VEA-VD-38	VALLEY-NTS 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	14.635	20.742	N/A	< 10				Existing UVLS or operational action plan (Switching after N-1)

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 Summer Off-Peak	2020 Summer Light Load	N/A	N/A	N/A	
VEA-VD-39	VALLEY-NTS 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_	P6	N-1-1	13.682	N/A	N/A	< 10	N/A				Existing UVLS or operational action plan (Switching after N-1)
VEA-VD-40	VALLEYVE 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	15.788	21.852	N/A	< 10				Existing UVLS or operational action plan (Switching after N-1)
VEA-VD-41	VALLEYVE 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_	P6	N-1-1	14.744	N/A	N/A	< 10	N/A				Existing UVLS or operational action plan (Switching after N-1)
VEA-VD-42	VISTA 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	17.027	22.338	N/A	< 10				Existing UVLS or operational action plan (Switching after N-1)
VEA-VD-43	VISTA 138 kV	Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_ and Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_	P6	N-1-1	16.193	N/A	N/A	< 10	N/A				Existing UVLS or operational action plan (Switching after N-1)

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)								Potential Mitigation Solutions
					2017 Summer Peak	2020 Summer Peak	2025 Summer Peak	2017 Summer Off-Peak	2020 Summer Light Load	N/A	N/A	N/A	
VEA-V-1	BOB SS 230 kV	Base Case	P0	N-0	< 1.05	< 1.05	< 1.05	< 1.05	1.0619				Adjust voltage schedules, taps and reactive devices or seek for an exception
VEA-V-2	PAHRUMP 230 kV	Base Case	P0	N-0	< 1.05	< 1.05	< 1.05	< 1.05	1.059				Adjust voltage schedules, taps and reactive devices or seek for an exception
VEA-V-3	BEATTY 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	0.8579	0.8054	N/A	> 0.9				Existing UVLS or operational action plan (Switching after N-1)
VEA-V-4	BEATTY 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_	P6	N-1-1	0.857	N/A	N/A	> 0.9	N/A				Existing UVLS or operational action plan (Switching after N-1)
VEA-V-5	CHARLSTN 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	0.8426	0.7923	N/A	> 0.9				Existing UVLS or operational action plan (Switching after N-1)
VEA-V-6	CHARLSTN 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_	P6	N-1-1	0.8423	N/A	N/A	> 0.9	N/A				Existing UVLS or operational action plan (Switching after N-1)
VEA-V-7	CHARLSTN 138 kV	Line PAHRUMP 138.0 to GAMEBIRD 138.0 Circuit 1_ and Line VISTA 138.0 to CHARLSTN 138.0 Circuit 1_	P6	N-1-1	> 0.9	> 0.9	0.8162	> 0.9	> 0.9				Existing UVLS or operational action plan (Switching after N-1)
VEA-V-8	DESERT VIEW 230 kV	Line NWEST 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	0.7984	0.7561	N/A	1.1986				Existing UVLS or operational action plan (Switching after N-1)
VEA-V-9	FRENCH-FLAT 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	0.8656	0.8156	N/A	> 0.9				Existing UVLS or operational action plan (Switching after N-1)
VEA-V-10	FRENCH-FLAT 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_	P6	N-1-1	0.8635	N/A	N/A	> 0.9	N/A				Existing UVLS or operational action plan (Switching after N-1)
VEA-V-11	GAMEBIRD 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	0.8468	0.7968	N/A	> 0.9				Existing UVLS or operational action plan (Switching after N-1)
VEA-V-12	GAMEBIRD 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_	P6	N-1-1	0.8523	N/A	N/A	> 0.9	N/A				Existing UVLS or operational action plan (Switching after N-1)

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)								Potential Mitigation Solutions
					2017 Summer Peak	2020 Summer Peak	2025 Summer Peak	2017 Summer Off-Peak	2020 Summer Light Load	N/A	N/A	N/A	
VEA-V-13	GAMEBIRD 138 kV	Line NWEST 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_	P6	N-1-1	0.867	N/A	N/A	> 0.9	N/A				Existing UVLS or operational action plan (Switching after N-1)
VEA-V-14	IND SPR 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	> 0.9	0.8943	N/A	> 0.9				Existing UVLS or operational action plan (Switching after N-1)
VEA-V-15	INNOVATION 230 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	0.775	0.7315	N/A	1.1595				Existing UVLS or operational action plan (Switching after N-1)
VEA-V-16	INNOVATION 230 kV	Line PAHRUMP 230.0 to INNOVATION 230.0 Circuit 1_ and Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_	P6	N-1-1	0.8991	> 0.9	> 0.9	> 0.9	1.1341				Existing UVLS or operational action plan (Switching after N-1)
VEA-V-17	JACKASSF 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	0.861	0.8102	N/A	> 0.9				Existing UVLS or operational action plan (Switching after N-1)
VEA-V-18	JACKASSF 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_	P6	N-1-1	0.8594	N/A	N/A	> 0.9	N/A				Existing UVLS or operational action plan (Switching after N-1)
VEA-V-19	JOHNNIE 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	0.8483	0.7976	N/A	> 0.9				Existing UVLS or operational action plan (Switching after N-1)
VEA-V-20	JOHNNIE 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_	P6	N-1-1	0.8491	N/A	N/A	> 0.9	N/A				Existing UVLS or operational action plan (Switching after N-1)
VEA-V-21	LTHRPWLS 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	0.8582	0.8059	N/A	> 0.9				Existing UVLS or operational action plan (Switching after N-1)
VEA-V-22	LTHRPWLS 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_	P6	N-1-1	0.8573	N/A	N/A	> 0.9	N/A				Existing UVLS or operational action plan (Switching after N-1)
VEA-V-23	MERC-DIST 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	0.8704	0.824	N/A	> 0.9				Existing UVLS or operational action plan (Switching after N-1)
VEA-V-24	MERC-DIST 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_	P6	N-1-1	0.8684	N/A	N/A	> 0.9	N/A				Existing UVLS or operational action plan (Switching after N-1)

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)								Potential Mitigation Solutions
					2017 Summer Peak	2020 Summer Peak	2025 Summer Peak	2017 Summer Off-Peak	2020 Summer Light Load	N/A	N/A	N/A	
VEA-V-25	PAHRUMP 230 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	0.7659	0.7212	N/A	1.1597				Existing UVLS or operational action plan (Switching after N-1)
VEA-V-26	PAHRUMP 230 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_	P6	N-1-1	0.7681	N/A	N/A	0.8843	N/A				Existing UVLS or operational action plan (Switching after N-1)
VEA-V-27	PAHRUMP 230 kV	Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_ and Line PAHRUMP 230.0 to INNOVATION 230.0 Circuit 1_	P6	N-1-1	N/A	0.7956	0.7927	N/A	> 0.9				Existing UVLS or operational action plan (Switching after N-1)
VEA-V-28	PAHRUMP 230 kV	Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_ and Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_	P6	N-1-1	0.7681	N/A	N/A	0.887	N/A				Existing UVLS or operational action plan (Switching after N-1)
VEA-V-29	RADAR 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	> 0.9	0.8987	N/A	> 0.9				Existing UVLS or operational action plan (Switching after N-1)
VEA-V-30	SANDY 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	0.8793	0.832	N/A	> 0.9				Existing UVLS or operational action plan (Switching after N-1)
VEA-V-31	SANDY 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_	P6	N-1-1	0.8993	N/A	N/A	> 0.9	N/A				Existing UVLS or operational action plan (Switching after N-1)
VEA-V-32	STOCK-WASH 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	0.8616	0.811	N/A	> 0.9				Existing UVLS or operational action plan (Switching after N-1)
VEA-V-33	STOCK-WASH 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_	P6	N-1-1	0.8599	N/A	N/A	> 0.9	N/A				Existing UVLS or operational action plan (Switching after N-1)
VEA-V-34	THSNDAIR 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	0.8429	0.7925	N/A	> 0.9				Existing UVLS or operational action plan (Switching after N-1)
VEA-V-35	THSNDAIR 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_	P6	N-1-1	0.8467	N/A	N/A	> 0.9	N/A				Existing UVLS or operational action plan (Switching after N-1)
VEA-V-36	TWEEZER 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	0.8642	0.8147	N/A	> 0.9				Existing UVLS or operational action plan (Switching after N-1)
VEA-V-37	TWEEZER 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_	P6	N-1-1	0.8622	N/A	N/A	> 0.9	N/A				Existing UVLS or operational action plan (Switching after N-1)

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)								Potential Mitigation Solutions
					2017 Summer Peak	2020 Summer Peak	2025 Summer Peak	2017 Summer Off-Peak	2020 Summer Light Load	N/A	N/A	N/A	
VEA-V-38	VALLEY-NTS 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	0.863	0.8133	N/A	> 0.9				Existing UVLS or operational action plan (Switching after N-1)
VEA-V-39	VALLEY-NTS 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_	P6	N-1-1	0.861	N/A	N/A	> 0.9	N/A				Existing UVLS or operational action plan (Switching after N-1)
VEA-V-40	VALLEYVE 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_	P6	N-1-1	N/A	0.854	0.8007	N/A	> 0.9				Existing UVLS or operational action plan (Switching after N-1)
VEA-V-41	VALLEYVE 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_	P6	N-1-1	0.8537	N/A	N/A	> 0.9	N/A				Existing UVLS or operational action plan (Switching after N-1)
VEA-V-42	VISTA 138 kV	Line INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1_ and Line PAHRUMP 230.0 to MEAD S 230.0 Circuit 1_	P6	N-1-1	0.8473	N/A	N/A	> 0.9	N/A				Existing UVLS or operational action plan (Switching after N-1)
VEA-V-43	VISTA 138 kV	Line PAHRUMP 230.0 to BOB SS 230.0 Circuit 1_ and Line PAHRUMP 230.0 to INNOVATION 230.0 Circuit 1_	P6	N-1-1	N/A	0.892	0.8906	N/A	> 0.9				Existing UVLS or operational action plan (Switching after N-1)

Study Area: Valley Electric Association

Transient Stability

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

2015-2016 ISO Reliability Assessment - Preliminary Study Results

Study Area: **Valley Electric Association**

Single Contingency Load Drop

ID	Worst Contingency	Category	Category Description	Amount of Load Drop (MW)								Potential Mitigation Solutions
				Select..	Select..	Select..	Select..	Select..	Select..	Select..	Select..	
X-SLD-1												

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

2015-2016 ISO Reliability Assessment - Preliminary Study Results

Study Area: Valley Electric Association

Single Source Substation with more than 100 MW Load

ID	Substation	Load Served (MW)								Potential Mitigation Solutions
		Select..	Select..	Select..	Select..	Select..	Select..	Select..	Select..	
X-SS-1										

No single source substation with more than 100 MW Load