

2014-2015 ISO Reliability Assessment - Preliminary Study Results

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

Thermal Overloads



ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	
VEA-SP-T-1	18003 AMARGOSA 230 18030 AMARGOSA 138 1	tran_65_PAHRUMP 138/230-kV Tran Bnk 1 + tran_66_PAHRUMP 138/230-kV Tran Bnk 2	C	N-1-1	96%	100%	104%	Operational action plan (Radialize the 138kV system in VEA and serve from three separate sources after the first N-1) or rely on UVLS
VEA-SP-T-2	18023 PAHRUMP 230 18085 PAHRUMP 138 1	line_15_SANDY -GAMEBIRD 138 Ckt. 1 + tran_66_PAHRUMP 138/230-kV Tran Bnk 2	C	N-1-1	91%	94%	102%	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-T-3	18023 PAHRUMP 230 18085 PAHRUMP 138 1	line_22_INNOVATION -MERCYSW 138 Ckt. 1 + tran_66_PAHRUMP 138/230-kV Tran Bnk 2	C	N-1-1	100%	103%	101%	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-T-4	18023 PAHRUMP 230 18085 PAHRUMP 138 1	tran_66_PAHRUMP 138/230-kV Tran Bnk 2 + line_2_JACKASSF -LTHRPWLS 138 Ckt. 1	C	N-1-1	95%	100%	100%	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-T-5	18023 PAHRUMP 230 18085 PAHRUMP 138 1	tran_66_PAHRUMP 138/230-kV Tran Bnk 2 + line_48_JACKASSF -LTHRPWLS 138 Circuit 1	C	N-1-1	95%	100%	100%	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-T-6	18023 PAHRUMP 230 18085 PAHRUMP 138 2	line_15_SANDY -GAMEBIRD 138 Ckt. 1 + tran_65_PAHRUMP 138/230-kV Tran Bnk 1	C	N-1-1	91%	94%	101%	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-T-7	18023 PAHRUMP 230 18085 PAHRUMP 138 2	line_22_INNOVATION -MERCYSW 138 Ckt. 1 + tran_65_PAHRUMP 138/230-kV Tran Bnk 1	C	N-1-1	99%	102%	100%	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-T-8	19012 MEAD S 230 18909 BOB SS 230 1	line_154_Line LUGO 500.0 to VICTORVL 500.0 Circuit + line_85_Line ELDORDO 500.0 to MCCULLGH 500.0 Circuit 1	C	N-1-1	<90%	<90%	103%	Congestion management or Operational action plan

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ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	
VEA-SP-T-9	19012 MEAD S SS 230 1	230 18909 BOB line_158_Line MEAD 500.0 to MARKETPL 500.0 Circuit + line_160_Line CRYSTAL 500.0 to MCCULLGH 500.0 Circuit	C	N-1-1	<90%	<90%	101%	Congestion management or Operational action plan
VEA-SP-T-10	19012 MEAD S SS 230 1	230 18909 BOB line_158_Line MEAD 500.0 to MARKETPL 500.0 Circuit + line_178_Line N.GILA 500.0 to IMPRLVLY 500.0 Circuit	C	N-1-1	<90%	<90%	102%	Congestion management or Operational action plan
VEA-SP-T-11	19012 MEAD S SS 230 1	230 18909 BOB line_158_Line MEAD 500.0 to MARKETPL 500.0 Circuit + line_79_Line MOENKOPI 500.0 to ELDORDO 500.0 Circuit 1	C	N-1-1	<90%	<90%	109%	Congestion management or Operational action plan
VEA-SP-T-12	19012 MEAD S SS 230 1	230 18909 BOB line_158_Line MEAD 500.0 to MARKETPL 500.0 Circuit + tran_131_Tran ELDORDO 500.00 to ELDORDO 230.00 Circui	C	N-1-1	<90%	<90%	100%	Congestion management or Operational action plan
VEA-SP-T-13	19012 MEAD S SS 230 1	230 18909 BOB line_158_Line MEAD 500.0 to MARKETPL 500.0 Circuit + tran_132_Tran ELDORDO 500.00 to ELDORDO 230.00 Circui	C	N-1-1	<90%	<90%	100%	Congestion management or Operational action plan
VEA-SP-T-14	19012 MEAD S SS 230 1	230 18909 BOB line_158_Line MEAD 500.0 to MARKETPL 500.0 Circuit + tran_98_Tran ELDORDO 500.00 to ELDORDO 230.00 Circuit	C	N-1-1	<90%	<90%	100%	Congestion management or Operational action plan
VEA-SP-T-15	19012 MEAD S SS 230 1	230 18909 BOB line_158_Line MEAD 500.0 to MARKETPL 500.0 Circuit + tran_99_Tran ELDORDO 500.00 to ELDORDO 230.00 Circuit	C	N-1-1	<90%	<90%	100%	Congestion management or Operational action plan

2014-2015 ISO Reliability Assessment - Preliminary Study Results

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Thermal Overloads



ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	
VEA-SP-T-16	19012 MEAD S SS 230 1	230 18909 BOB line_160_Line CRYSTAL 500.0 to MCCULLGH 500.0 Circuit + line_158_Line MEAD 500.0 to MARKETPL 500.0 Circuit	C	N-1-1	<90%	<90%	101%	Congestion management or Operational action plan
VEA-SP-T-17	19012 MEAD S SS 230 1	230 18909 BOB line_178_Line N.GILA 500.0 to IMPRLVLY 500.0 Circuit + line_158_Line MEAD 500.0 to MARKETPL 500.0 Circuit	C	N-1-1	<90%	<90%	102%	Congestion management or Operational action plan
VEA-SP-T-18	19012 MEAD S SS 230 1	230 18909 BOB line_79_Line MOENKOPI 500.0 to ELDORDO 500.0 Circuit 1 + line_158_Line MEAD 500.0 to MARKETPL 500.0 Circuit	C	N-1-1	<90%	<90%	109%	Congestion management or Operational action plan
VEA-SP-T-19	19012 MEAD S SS 230 1	230 18909 BOB line_79_Line MOENKOPI 500.0 to ELDORDO 500.0 Circuit 1 + line_85_Line ELDORDO 500.0 to MCCULLGH 500.0 Circuit 1	C	N-1-1	<90%	<90%	124%	Congestion management or Operational action plan
VEA-SP-T-20	19012 MEAD S SS 230 1	230 18909 BOB line_85_Line ELDORDO 500.0 to MCCULLGH 500.0 Circuit 1 + line_154_Line LUGO 500.0 to VICTORVL 500.0 Circuit	C	N-1-1	<90%	<90%	103%	Congestion management or Operational action plan
VEA-SP-T-21	19012 MEAD S SS 230 1	230 18909 BOB line_85_Line ELDORDO 500.0 to MCCULLGH 500.0 Circuit 1 + line_79_Line MOENKOPI 500.0 to ELDORDO 500.0 Circuit 1	C	N-1-1	<90%	<90%	124%	Congestion management or Operational action plan

Select either Preliminary Study Results or Study Results...

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



Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2016 Summer Off-Peak	2019 Summer Light Load	N/A	

No thermal overload concerns identified.

2014-2015 ISO Reliability Assessment - Preliminary Study Results

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

Voltage Deviations



ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	
VEA-SP-VD-1	BOB SS 230 kV	line_3_MEAD S -BOB SS 230 Ckt. 1	B	N-1	5%	<5%	<5%	Add to the exception list or dynamic reactive support
VEA-SP-VD-2	INNOVATION 230 kV	line_1_NWEST -DESERT VIEW -INNOVATION 230-kV Ckt. 1	B	N-1	6%	6%	6%	Add to the exception list or dynamic reactive support
VEA-SP-VD-3	SANDY 138 kV	tran_66_PAHRUMP 138/230-kV Tran Bnk 2 + tran_65_PAHRUMP 138/230-kV Tran Bnk 1	C	N-1-1	<10%	12%	<10%	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-VD-4	VISTA 138 kV	line_13_PAHRUMP -VISTA 138 Ckt. 1 + line_20_GAMEBIRD -THSNDAIR 138 Ckt. 1	C	N-1-1	12%	14%	14%	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-VD-5	VISTA 138 kV	tran_66_PAHRUMP 138/230-kV Tran Bnk 2 + tran_65_PAHRUMP 138/230-kV Tran Bnk 1	C	N-1-1	13%	15%	14%	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-VD-6	BEATTY 138 kV	line_22_INNOVATION -MERCYSW 138 Ckt. 1 + line_31_CANYON -SNOW MTN 138 Circuit 1	C	N-1-1	<10%	11%	<10%	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-VD-7	BEATTY 138 kV	line_22_INNOVATION -MERCYSW 138 Ckt. 1 + line_41_NWEST -SNOW MTN 138 Circuit 1	C	N-1-1	<10%	11%	<10%	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-VD-8	JOHNNIE 138 kV	line_13_PAHRUMP -VISTA 138 Ckt. 1 + line_20_GAMEBIRD -THSNDAIR 138 Ckt. 1	C	N-1-1	<10%	13%	13%	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-VD-9	JOHNNIE 138 kV	tran_66_PAHRUMP 138/230-kV Tran Bnk 2 + tran_65_PAHRUMP 138/230-kV Tran Bnk 1	C	N-1-1	12%	13%	13%	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-VD-10	PAHRUMP 138 kV	tran_66_PAHRUMP 138/230-kV Tran Bnk 2 + tran_65_PAHRUMP 138/230-kV Tran Bnk 1	C	N-1-1	14%	16%	15%	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-VD-11	TWEEZER 138 kV	line_22_INNOVATION -MERCYSW 138 Ckt. 1 + line_31_CANYON -SNOW MTN 138 Circuit 1	C	N-1-1	15%	16%	<10%	Operational action plan (Radialize the 138kV system after the first N-1 contingency)

2014-2015 ISO Reliability Assessment - Preliminary Study Results

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

Voltage Deviations



ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	
VEA-SP-VD-12	TWEEZER 138 kV	line_22_INNOVATION -MERCYSW 138 Ckt. 1 + line_41_NWEST -SNOW MTN 138 Circuit 1	C	N-1-1	15%	16%	<10%	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-VD-13	BONDGDP 138 kV	line_22_INNOVATION -MERCYSW 138 Ckt. 1 + line_31_CANYON -SNOW MTN 138 Circuit 1	C	N-1-1	<10%	11%	<10%	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-VD-14	BONDGDP 138 kV	line_22_INNOVATION -MERCYSW 138 Ckt. 1 + line_41_NWEST -SNOW MTN 138 Circuit 1	C	N-1-1	<10%	11%	<10%	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-VD-15	CHARLSTN 138 kV	line_13_PAHRUMP -VISTA 138 Ckt. 1 + line_20_GAMEBIRD -THSNDIAIR 138 Ckt. 1	C	N-1-1	13%	16%	16%	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-VD-16	CHARLSTN 138 kV	line_14_PAHRUMP -GAMEBIRD 138 Ckt. 1 + line_19_VISTA -CHARLSTN 138 Ckt. 1	C	N-1-1	12%	14%	<10%	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-VD-17	CHARLSTN 138 kV	tran_65_PAHRUMP 138/230-kV Tran Bnk 1 + tran_66_PAHRUMP 138/230-kV Tran Bnk 2	C	N-1-1	13%	15%	14%	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-VD-18	GAMEBIRD 138 kV	line_14_PAHRUMP -GAMEBIRD 138 Ckt. 1 + line_19_VISTA -CHARLSTN 138 Ckt. 1	C	N-1-1	11%	12%	<10%	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-VD-19	GAMEBIRD 138 kV	tran_65_PAHRUMP 138/230-kV Tran Bnk 1 + tran_66_PAHRUMP 138/230-kV Tran Bnk 2	C	N-1-1	14%	15%	14%	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-VD-20	JACKASSF 138 kV	line_22_INNOVATION -MERCYSW 138 Ckt. 1 + line_31_CANYON -SNOW MTN 138 Circuit 1	C	N-1-1	12%	13%	0%	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-VD-21	JACKASSF 138 kV	line_22_INNOVATION -MERCYSW 138 Ckt. 1 + line_41_NWEST -SNOW MTN 138 Circuit 1	C	N-1-1	12%	13%	0%	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-VD-22	LTHRPWLS 138 kV	line_22_INNOVATION -MERCYSW 138 Ckt. 1 + line_31_CANYON -SNOW MTN 138 Circuit 1	C	N-1-1	<10%	11%	<10%	Operational action plan (Radialize the 138kV system after the first N-1 contingency)

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Voltage Deviations



ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	
VEA-SP-VD-23	LTHRPWLS 138 kV	line_22_INNOVATION -MERCYSW 138 Ckt. 1 + line_41_NWEST -SNOW MTN 138 Circuit 1	C	N-1-1	<10%	11%	<10%	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-VD-24	MERCYSW 138 kV	line_22_INNOVATION -MERCYSW 138 Ckt. 1 + line_31_CANYON -SNOW MTN 138 Circuit 1	C	N-1-1	16%	17%	<10%	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-VD-25	MERCYSW 138 kV	line_22_INNOVATION -MERCYSW 138 Ckt. 1 + line_41_NWEST -SNOW MTN 138 Circuit 1	C	N-1-1	16%	17%	<10%	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-VD-26	MERC_DIST 138 kV	line_22_INNOVATION -MERCYSW 138 Ckt. 1 + line_31_CANYON -SNOW MTN 138 Circuit 1	C	N-1-1	16%	17%	<10%	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-VD-27	MERC_DIST 138 kV	line_22_INNOVATION -MERCYSW 138 Ckt. 1 + line_41_NWEST -SNOW MTN 138 Circuit 1	C	N-1-1	16%	17%	<10%	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-VD-28	INNOVATION 230 kV	line_8_PAHRUMP -INNOVATION 230 Ckt. 1 + line_1_NWEST -DESERT VIEW -INNOVATION 230-kV Ckt. 1	C	N-1-1	11%	11%	11%	Operational action plan (Radialize the 138kV system in VEA and serve from three separate sources after the first N-1) or rely on UVLS
VEA-SP-VD-29	STOCK_WASH 138 kV	line_22_INNOVATION -MERCYSW 138 Ckt. 1 + line_31_CANYON -SNOW MTN 138 Circuit 1	C	N-1-1	13%	14%	<10%	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-VD-30	STOCK_WASH 138 kV	line_22_INNOVATION -MERCYSW 138 Ckt. 1 + line_41_NWEST -SNOW MTN 138 Circuit 1	C	N-1-1	13%	14%	<10%	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-VD-31	VALLEY_NTS 138 kV	line_22_INNOVATION -MERCYSW 138 Ckt. 1 + line_31_CANYON -SNOW MTN 138 Circuit 1	C	N-1-1	14%	16%	<10%	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-VD-32	VALLEY_NTS 138 kV	line_22_INNOVATION -MERCYSW 138 Ckt. 1 + line_41_NWEST -SNOW MTN 138 Circuit 1	C	N-1-1	14%	16%	<10%	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-VD-33	FRENCH_FLAT 138 kV	line_22_INNOVATION -MERCYSW 138 Ckt. 1 + line_31_CANYON -SNOW MTN 138 Circuit 1	C	N-1-1	15%	16%	<10%	Operational action plan (Radialize the 138kV system after the first N-1 contingency)

2014-2015 ISO Reliability Assessment - Preliminary Study Results

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Voltage Deviations



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					2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	
VEA-SP-VD-34	FRENCH_FLAT 138 kV	line_22_INNOVATION -MERCYSW 138 Ckt. 1 + line_41_NWEST -SNOW MTN 138 Circuit 1	C	N-1-1	15%	16%	<10%	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-VD-35	CRAZY EYE SS 230 kV	line_47_LENZIE 500 -NWEST 500 Circuit 1 + line_6_CRAZY EYE SS -BOB SS 230 Ckt. 1	C	N-1-1	<10%	6%	<10%	Congestion management tp prevent overload on Mead - Bob 230kV line or Operational action plan

2014-2015 ISO Reliability Assessment - Preliminary Study Results

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

Voltage Deviations



ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2016 Summer Off-Peak	2019 Summer Light Load	N/A	
VEA-NP-VD-1	INNOVATION 230 kV	line_8_PAHRUMP -INNOVATION 230 Ckt. 1 + line_1_NWEST -DESERT VIEW -INNOVATION 230-kV Ckt. 1	C	N-1-1	<10%	11%	N/A	Operational action plan (Lock/adjust the 230/138kV and 138/24kV taps after the first N-1) or set the UVLS to monitor HV side

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

High/Low Voltage



ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	
VEA-SP-V-1	SANDY 138kV	tran_65_PAHRUMP 138/230-kV Tran Bnk 1 + tran_66_PAHRUMP 138/230-kV Tran Bnk 2	C	N-1-1	>0.90	0.90	>0.90	Operational action plan (Radialize the 138kV system in VEA and serve from three separate sources after the first N-1) or rely on UVLS
VEA-SP-V-2	VISTA 138kV	line_13_PAHRUMP -VISTA 138 Ckt. 1 + line_20_GAMEBIRD -THSNDIAIR 138 Ckt. 1	C	N-1-1	0.89	0.86	0.86	Operational action plan (Radialize the 138kV system in VEA and serve from three separate sources after the first N-1) or rely on UVLS
VEA-SP-V-3	VISTA 138kV	tran_65_PAHRUMP 138/230-kV Tran Bnk 1 + tran_66_PAHRUMP 138/230-kV Tran Bnk 2	C	N-1-1	0.89	0.87	0.88	Operational action plan (Radialize the 138kV system in VEA and serve from three separate sources after the first N-1) or rely on UVLS
VEA-SP-V-4	BEATTY 138kV	line_22_INNOVATION -MERCERYSW 138 Ckt. 1 + line_31_CANYON -SNOW MTN 138 Circuit 1	C	N-1-1	>0.90	0.89	>0.90	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-V-5	BEATTY 138kV	line_22_INNOVATION -MERCERYSW 138 Ckt. 1 + line_41_NWEST -SNOW MTN 138 Circuit 1	C	N-1-1	>0.90	0.89	>0.90	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-V-6	CANYON 138kV	line_31_CANYON -SNOW MTN 138 Circuit 1 + line_5_PAHRUMP -CRAZY EYE SS 230 Ckt. 1	C	N-1-1	>0.90	0.88	>0.90	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-V-7	CANYON 138kV	line_31_CANYON -SNOW MTN 138 Circuit 1 + line_6_CRAZY EYE SS -BOB SS 230 Ckt. 1	C	N-1-1	>0.90	0.89	>0.90	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-V-8	IS TAP 138kV	line_22_INNOVATION -MERCERYSW 138 Ckt. 1 + line_31_CANYON -SNOW MTN 138 Circuit 1	C	N-1-1	0.76	0.75	>0.90	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-V-9	JOHNNIE 138kV	line_13_PAHRUMP -VISTA 138 Ckt. 1 + line_20_GAMEBIRD -THSNDIAIR 138 Ckt. 1	C	N-1-1	>0.90	0.87	0.87	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-V-10	JOHNNIE 138kV	tran_65_PAHRUMP 138/230-kV Tran Bnk 1 + tran_66_PAHRUMP 138/230-kV Tran Bnk 2	C	N-1-1	0.90	0.88	0.89	Operational action plan (Radialize the 138kV system after the first N-1 contingency)

2014-2015 ISO Reliability Assessment - Preliminary Study Results

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High/Low Voltage



ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	
VEA-SP-V-11	PAHRUMP 138kV	tran_65_PAHRUMP 138/230-kV Tran Bnk 1 + tran_66_PAHRUMP 138/230-kV Tran Bnk 2	C	N-1-1	0.88	0.86	0.88	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-V-12	PAHRUMP 230kV	line_47_LENZIE 500 -NWEST 500 Circuit 1 + line_5_PAHRUMP -CRAZY EYE SS 230 Ckt. 1	C	N-1-1	0.90	0.88	>0.90	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-V-13	PAHRUMP 230kV	line_47_LENZIE 500 -NWEST 500 Circuit 1 + line_6_CRAZY EYE SS -BOB SS 230 Ckt. 1	C	N-1-1	>0.90	0.88	>0.90	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-V-14	TWEEZER 138kV	line_22_INNOVATION -MERCYSW 138 Ckt. 1 + line_31_CANYON -SNOW MTN 138 Circuit 1	C	N-1-1	0.83	0.82	>0.90	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-V-15	TWEEZER 138kV	line_22_INNOVATION -MERCYSW 138 Ckt. 1 + line_41_NWEST -SNOW MTN 138 Circuit 1	C	N-1-1	0.83	0.82	>0.90	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-V-16	BONDGDP 138kV	line_22_INNOVATION -MERCYSW 138 Ckt. 1 + line_31_CANYON -SNOW MTN 138 Circuit 1	C	N-1-1	>0.90	0.89	>0.90	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-V-17	BONDGDP 138kV	line_22_INNOVATION -MERCYSW 138 Ckt. 1 + line_41_NWEST -SNOW MTN 138 Circuit 1	C	N-1-1	>0.90	0.89	>0.90	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-V-18	CHARLSTN 138kV	line_13_PAHRUMP -VISTA 138 Ckt. 1 + line_20_GAMEBIRD -THSNDIR 138 Ckt. 1	C	N-1-1	0.88	0.85	0.85	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-V-19	CHARLSTN 138kV	line_14_PAHRUMP -GAMEBIRD 138 Ckt. 1 + line_19_VISTA -CHARLSTN 138 Ckt. 1	C	N-1-1	0.88	0.87	>0.90	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-V-20	CHARLSTN 138kV	tran_65_PAHRUMP 138/230-kV Tran Bnk 1 + tran_66_PAHRUMP 138/230-kV Tran Bnk 2	C	N-1-1	0.88	0.87	0.88	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-V-21	COLDCEK 138kV	line_22_INNOVATION -MERCYSW 138 Ckt. 1 + line_31_CANYON -SNOW MTN 138 Circuit 1	C	N-1-1	0.74	0.72	>0.90	Operational action plan (Radialize the 138kV system after the first N-1 contingency)

2014-2015 ISO Reliability Assessment - Preliminary Study Results

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

High/Low Voltage



ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	
VEA-SP-V-22	GAMEBIRD 138kV	line_14_PAHRUMP -GAMEBIRD 138 Ckt. 1 + line_19_VISTA -CHARLSTN 138 Ckt. 1	C	N-1-1	0.89	0.88	>0.90	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-V-23	GAMEBIRD 138kV	tran_65_PAHRUMP 138/230-kV Tran Bnk 1 + tran_66_PAHRUMP 138/230-kV Tran Bnk 2	C	N-1-1	0.88	0.87	0.88	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-V-24	JACKASSF 138kV	line_22_INNOVATION -MERCERYSW 138 Ckt. 1 + line_31_CANYON -SNOW MTN 138 Circuit 1	C	N-1-1	0.87	0.85	>0.90	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-V-25	JACKASSF 138kV	line_22_INNOVATION -MERCERYSW 138 Ckt. 1 + line_41_NWEST -SNOW MTN 138 Circuit 1	C	N-1-1	0.87	0.85	>0.90	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-V-26	LTHRPWLS 138kV	line_22_INNOVATION -MERCERYSW 138 Ckt. 1 + line_31_CANYON -SNOW MTN 138 Circuit 1	C	N-1-1	>0.90	0.89	>0.90	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-V-27	LTHRPWLS 138kV	line_22_INNOVATION -MERCERYSW 138 Ckt. 1 + line_41_NWEST -SNOW MTN 138 Circuit 1	C	N-1-1	>0.90	0.89	>0.90	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-V-28	MERCERYSW 138kV	line_22_INNOVATION -MERCERYSW 138 Ckt. 1 + line_31_CANYON -SNOW MTN 138 Circuit 1	C	N-1-1	0.82	0.81	>0.90	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-V-29	MERCERYSW 138kV	line_22_INNOVATION -MERCERYSW 138 Ckt. 1 + line_41_NWEST -SNOW MTN 138 Circuit 1	C	N-1-1	0.82	0.81	>0.90	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-V-30	THSNDAIR 138kV	line_13_PAHRUMP -VISTA 138 Ckt. 1 + line_20_GAMEBIRD -THSNDAIR 138 Ckt. 1	C	N-1-1	0.87	0.84	0.83	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-V-31	THSNDAIR 138kV	line_14_PAHRUMP -GAMEBIRD 138 Ckt. 1 + line_19_VISTA -CHARLSTN 138 Ckt. 1	C	N-1-1	0.89	0.88	>0.90	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-V-32	THSNDAIR 138kV	tran_65_PAHRUMP 138/230-kV Tran Bnk 1 + tran_66_PAHRUMP 138/230-kV Tran Bnk 2	C	N-1-1	0.88	0.86	0.88	Operational action plan (Radialize the 138kV system after the first N-1 contingency)

2014-2015 ISO Reliability Assessment - Preliminary Study Results

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

High/Low Voltage



ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	
VEA-SP-V-33	MERC_DIST 138kV	line_22_INNOVATION -MERCYSW 138 Ckt. 1 + line_31_CANYON -SNOW MTN 138 Circuit 1	C	N-1-1	0.82	0.81	>0.90	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-V-34	MERC_DIST 138kV	line_22_INNOVATION -MERCYSW 138 Ckt. 1 + line_41_NWEST -SNOW MTN 138 Circuit 1	C	N-1-1	0.82	0.81	>0.90	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-V-35	INNOVATION 230kV	line_47_LENZIE 500 -NWEST 500 Circuit 1 + line_5_PAHRUMP -CRAZY EYE SS 230 Ckt. 1	C	N-1-1	>0.90	0.90	>0.90	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-V-36	INNOVATION 230kV	line_47_LENZIE 500 -NWEST 500 Circuit 1 + line_6_CRAZY EYE SS -BOB SS 230 Ckt. 1	C	N-1-1	>0.90	0.90	>0.90	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-V-37	STOCK_WASH 138kV	line_22_INNOVATION -MERCYSW 138 Ckt. 1 + line_31_CANYON -SNOW MTN 138 Circuit 1	C	N-1-1	0.86	0.85	>0.90	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-V-38	STOCK_WASH 138kV	line_22_INNOVATION -MERCYSW 138 Ckt. 1 + line_41_NWEST -SNOW MTN 138 Circuit 1	C	N-1-1	0.86	0.85	>0.90	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-V-39	VALLEY_NTS 138kV	line_22_INNOVATION -MERCYSW 138 Ckt. 1 + line_31_CANYON -SNOW MTN 138 Circuit 1	C	N-1-1	0.84	0.83	>0.90	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-V-40	VALLEY_NTS 138kV	line_22_INNOVATION -MERCYSW 138 Ckt. 1 + line_41_NWEST -SNOW MTN 138 Circuit 1	C	N-1-1	0.84	0.82	>0.90	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-V-41	FRENCH_FLAT 138kV	line_22_INNOVATION -MERCYSW 138 Ckt. 1 + line_31_CANYON -SNOW MTN 138 Circuit 1	C	N-1-1	0.83	0.82	>0.90	Operational action plan (Radialize the 138kV system after the first N-1 contingency)
VEA-SP-V-42	FRENCH_FLAT 138kV	line_22_INNOVATION -MERCYSW 138 Ckt. 1 + line_41_NWEST -SNOW MTN 138 Circuit 1	C	N-1-1	0.83	0.82	>0.90	Operational action plan (Radialize the 138kV system after the first N-1 contingency)

2014-2015 ISO Reliability Assessment - Preliminary Study Results

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

High/Low Voltage



ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	
VEA-SP-V-43	CRAZY EYE SS 230kV	line_47_LENZIE 500 -NWEST 500 Circuit 1 + line_6_CRAZY EYE SS -BOB SS 230 Ckt. 1	C	N-1-1	>0.90	0.88	>0.90	Operational action plan (Radialize the 138kV system in VEA and serve from three separate sources after the first N-1) or rely on UVLS

2014-2015 ISO Reliability Assessment - Preliminary Study Results

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

High/Low Voltage



ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2016 Summer Off-Peak	2019 Summer Light Load	N/A	
VEA-NP-V-1	INNOVATION 230 kV	line_8_PAHRUMP -INNOVATION 230 Ckt. 1 + line_1_NWEST -DESERT VIEW - INNOVATION 230-kV Ckt. 1	C	N-1-1	<0.90	0.90		Operational action plan (Lock/adjust the 230/138kV and 138/24kV taps after the first N-1) or set the UVLS to monitor HV side



ID	Contingency	Category	Category Description	Transient Stability Performance			Potential Mitigation Solutions
				2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	

No transient stability concerns identified.



Transient Stability

ID	Contingency	Category	Category Description	Transient Stability Performance			Potential Mitigation Solutions
				2016 Summer Off-Peak	2019 Summer Light Load	N/A	

No transient stability concerns identified.



Post-Transient Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	

No post-transient thermal overload concerns identified.



Post-Transient Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2016 Summer Off-Peak	2019 Summer Light Load	N/A	

No post-transient thermal overload concerns identified.



Post-Transient Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	

No post-transient voltage deviation concerns identified.



Post-Transient Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2016 Summer Off-Peak	2019 Summer Light Load	N/A	

No post-transient voltage deviation concerns identified.

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



Single Contingency Load Drop

ID	Worst Contingency	Category	Category Description	Amount of Load Drop (MW)			Potential Mitigation Solutions
				2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	

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

Single Contingency Load Drop

ID	Worst Contingency	Category	Category Description	Amount of Load Drop (MW)			Potential Mitigation Solutions
				2016 Summer Off-Peak	2019 Summer Light Load	N/A	

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

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

Single Source Substation with more than 100 MW Load



ID	Substation	Load Served (MW)			Potential Mitigation Solutions
		2016 Summer Peak	2019 Summer Peak	2024 Summer Peak	

No single source substation with more than 100 MW Load

2014-2015 ISO Reliability Assessment - Preliminary Study Results

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

Single Source Substation with more than 100 MW Load



ID	Substation	Load Served (MW)			Potential Mitigation Solutions
		2016 Summer Off-Peak	2019 Summer Light Load	N/A	

No single source substation with more than 100 MW Load