

**Thermal Overloads**

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	
VEA-SP-T-1	18003 AMARGOSA 230 - 18030 AMARGOSA 138 - Ckt 1	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C	N-1-1	114%	Diverged	Diverged	Till 2015 - UVLS will drop 1 load block and will mitigate the issue. 2015 onwards - Operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency so that the next 230kV line (N-1) will result in consequential loss of load.
VEA-SP-T-2	18023 PAHRUMP 230 - 18085 PAHRUMP 138 - Ckt 1	AMARGOSA 230/138-kV Tran Bnk 1 _PAHRUMP 230/138-kV Tran Bnk 2	C	N-1-1	94%	101%	83%	Radialize 138kV system after the first contingency to limit the amount of load being served from Pahrump OR drop load after the second contingency if the bank has short-term emergency rating
VEA-SP-T-3	18023 PAHRUMP 230 - 18085 PAHRUMP 138 - Ckt 1	AMARGOSA -SANDY 138-kV Ckt 1 _PAHRUMP 230/138-kV Tran Bnk 2	C	N-1-1	94%	101%	83%	Radialize 138kV system after the first contingency to limit the amount of load being served from Pahrump OR drop load after the second contingency if the bank has short-term emergency rating

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ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	
VEA-SP-T-4	18023 PAHRUMP 230 - 18085 PAHRUMP 138 - Ckt 1	INNOVATION -MERCYSW 138-kV Ckt 1 _PAHRUMP 230/138-kV Tran Bnk 2	C	N-1-1	94%	108%	88%	Radialize 138kV system after the first contingency to limit the amount of load being served from Pahrump OR drop load after the second contingency if the bank has short-term emergency rating
VEA-SP-T-5	18023 PAHRUMP 230 - 18085 PAHRUMP 138 - Ckt 1	JACKASSF -LTHRPWLS 138-kV Ckt 1 _PAHRUMP 230/138-kV Tran Bnk 2	C	N-1-1	96%	105%	82%	Radialize 138kV system after the first contingency to limit the amount of load being served from Pahrump OR drop load after the second contingency if the bank has short-term emergency rating
VEA-SP-T-6	18023 PAHRUMP 230 - 18085 PAHRUMP 138 - Ckt 1	JACKASSF -MERCYSW 138-kV Ckt 1 _PAHRUMP 230/138-kV Tran Bnk 2	C	N-1-1	94%	101%	81%	Radialize 138kV system after the first contingency to limit the amount of load being served from Pahrump OR drop load after the second contingency if the bank has short-term emergency rating
VEA-SP-T-7	18023 PAHRUMP 230 - 18085 PAHRUMP 138 - Ckt 1	LTHRPWLS -VALLEYTP 138-kV Ckt 1 _PAHRUMP 230/138-kV Tran Bnk 2	C	N-1-1	96%	105%	81%	Radialize 138kV system after the first contingency to limit the amount of load being served from Pahrump OR drop load after the second contingency if the bank has short-term emergency rating

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ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	
VEA-SP-T-8	18023 PAHRUMP 230 - 18085 PAHRUMP 138 - Ckt 1	PAHRUMP 230/138-kV Tran Bnk 2 _INNOVATION 230/138-kV Tran Bnk 1	C	N-1-1	94%	108%	88%	Radialize 138kV system after the first contingency to limit the amount of load being served from Pahrump OR drop load after the second contingency if the bank has short-term emergency rating
VEA-SP-T-9	18023 PAHRUMP 230 - 18085 PAHRUMP 138 - Ckt 2	AMARGOSA 230/138-kV Tran Bnk 1 _PAHRUMP 230/138-kV Tran Bnk 1	C	N-1-1	94%	101%	83%	Radialize 138kV system after the first contingency to limit the amount of load being served from Pahrump OR drop load after the second contingency if the bank has short-term emergency rating
VEA-SP-T-10	18023 PAHRUMP 230 - 18085 PAHRUMP 138 - Ckt 2	AMARGOSA -SANDY 138-kV Ckt 1 _PAHRUMP 230/138-kV Tran Bnk 1	C	N-1-1	94%	101%	83%	Radialize 138kV system after the first contingency to limit the amount of load being served from Pahrump OR drop load after the second contingency if the bank has short-term emergency rating
VEA-SP-T-11	18023 PAHRUMP 230 - 18085 PAHRUMP 138 - Ckt 2	INNOVATION -MERCYSW 138-kV Ckt 1 _PAHRUMP 230/138-kV Tran Bnk 1	C	N-1-1	93%	108%	88%	Radialize 138kV system after the first contingency to limit the amount of load being served from Pahrump OR drop load after the second contingency if the bank has short-term emergency rating

**Thermal Overloads**

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	
VEA-SP-T-12	18023 PAHRUMP 230 - 18085 PAHRUMP 138 - Ckt 2	JACKASSF -LTHRPWLS 138-kV Ckt 1 _PAHRUMP 230/138-kV Tran Bnk 1	C	N-1-1	97%	105%	82%	Radialize 138kV system after the first contingency to limit the amount of load being served from Pahrump OR drop load after the second contingency if the bank has short-term emergency rating
VEA-SP-T-13	18023 PAHRUMP 230 - 18085 PAHRUMP 138 - Ckt 2	LTHRPWLS -VALLEYTP 138-kV Ckt 1 _PAHRUMP 230/138-kV Tran Bnk 1	C	N-1-1	95%	104%	81%	Radialize 138kV system after the first contingency to limit the amount of load being served from Pahrump OR drop load after the second contingency if the bank has short-term emergency rating
VEA-SP-T-14	18023 PAHRUMP 230 - 18085 PAHRUMP 138 - Ckt 2	PAHRUMP 230/138-kV Tran Bnk 1 _INNOVATION 230/138-kV Tran Bnk 1	C	N-1-1	93%	108%	88%	Radialize 138kV system after the first contingency to limit the amount of load being served from Pahrump OR drop load after the second contingency if the bank has short-term emergency rating

# 2013/2014 ISO Reliability Assessment - Study Results

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



## Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	
VEA-SP-T-15	18045 CANYON 138 - 18050 COLD CREK 138 - Ckt 1	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C	N-1-1	130%	Diverged	Diverged	Till 2015 - UVLS will drop 1 load block and will mitigate the issue. 2015 onwards - Operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency so that the next 230kV line (N-1) will result in consequential loss of load.
VEA-SP-T-16	18045 CANYON 138 - 18102 SNOW MTN 138 - Ckt 1	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C	N-1-1	131%	Diverged	Diverged	Till 2015 - UVLS will drop 1 load block and will mitigate the issue. 2015 onwards - Operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency so that the next 230kV line (N-1) will result in consequential loss of load.

**Thermal Overloads**

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	
VEA-SP-T-17	18050 COLD CREK 138 - 18091 RADAR 138 - Ckt 1	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C	N-1-1	125%	Diverged	Diverged	Till 2015 - UVLS will drop 1 load block and will mitigate the issue. 2015 onwards - Operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency so that the next 230kV line (N-1) will result in consequential loss of load.
VEA-SP-T-18	18073 IS TAP 138 - 18078 MERCURY SW 138 - Ckt 1	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C	N-1-1	114%	Diverged	Diverged	Till 2015 - UVLS will drop 1 load block and will mitigate the issue. 2015 onwards - Operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency so that the next 230kV line (N-1) will result in consequential loss of load.

# 2013/2014 ISO Reliability Assessment - Study Results

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



## Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	
VEA-SP-T-19	18073 IS TAP 138 - Ckt 1 138 - 18091 RADAR	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C	N-1-1	124%	Diverged	Diverged	Till 2015 - UVLS will drop 1 load block and will mitigate the issue. 2015 onwards - Operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency so that the next 230kV line (N-1) will result in consequential loss of load.
VEA-SP-T-20	18084 NWEST SNOW MTN 138 - Ckt 1 138 - 18102	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C	N-1-1	132%	Diverged	Diverged	Till 2015 - UVLS will drop 1 load block and will mitigate the issue. 2015 onwards - Operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency so that the next 230kV line (N-1) will result in consequential loss of load.

San Onofre Nuclear Generation Station was retired on June 7, 2013 and therefore was removed from the base cases used for the 2013/14 ISO transmission planning process.

**Voltage Deviations**

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	
VEA-SP-VD-1	18023 PAHRUMP 230 kV	PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	B	N-1	-6%	-6%	-8%	Dynamic reactive support or an exception.
VEA-SP-VD-2	18023 PAHRUMP 230 kV	CRAZY EYE SS -BOB SS 230-kV Ckt 1	B	N-1	-5%	-6%	0%	Dynamic reactive support or an exception.
VEA-SP-VD-3	18919 CRAZY EYE SS 230 kV	CRAZY EYE SS -BOB SS 230-kV Ckt 1	B	N-1	-6%	-7%	0%	Dynamic reactive support or an exception.
VEA-SP-VD-4	18023 PAHRUMP 230 kV	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C3	N-1-1	-27%	Diverged	Diverged	Till 2015 - UVLS will drop 1 load block and will mitigate the issue. 2015 onwards - Operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency so that the next 230kV line (N-1) will result in consequential loss of load.
VEA-SP-VD-5	18036 BEATTY 138 kV	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C3	N-1-1	-19%	Diverged	Diverged	Till 2015 - UVLS will drop 1 load block and will mitigate the issue. 2015 onwards - Operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency so that the next 230kV line (N-1) will result in consequential loss of load.
VEA-SP-VD-6	18071 IND SPR 138 kV	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C3	N-1-1	-10%	Diverged	Diverged	Till 2015 - UVLS will drop 1 load block and will mitigate the issue. 2015 onwards - Operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency so that the next 230kV line (N-1) will result in consequential loss of load.

**Voltage Deviations**

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	
VEA-SP-VD-7	18076 LTHRPWLS 138 kV	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C3	N-1-1	-19%	Diverged	Diverged	Till 2015 - UVLS will drop 1 load block and will mitigate the issue. 2015 onwards - Operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency so that the next 230kV line (N-1) will result in consequential loss of load.
VEA-SP-VD-8	18083 NTSCANYN 138 kV	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C3	N-1-1	-18%	Not Run	Not Run	Till 2015 - UVLS will drop 1 load block and will mitigate the issue. 2015 onwards - Operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency so that the next 230kV line (N-1) will result in consequential loss of load.
VEA-SP-VD-9	18085 PAHRUMP 138 kV	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C3	N-1-1	-21%	Diverged	Diverged	Till 2015 - UVLS will drop 1 load block and will mitigate the issue. 2015 onwards - Operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency so that the next 230kV line (N-1) will result in consequential loss of load.

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ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	
VEA-SP-VD-10	18098 SANDY 138 kV	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C3	N-1-1	-17%	Diverged	Diverged	Till 2015 - UVLS will drop 1 load block and will mitigate the issue. 2015 onwards - Operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency so that the next 230kV line (N-1) will result in consequential loss of load.
VEA-SP-VD-11	18111 VALLEYVE 138 kV	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C3	N-1-1	-19%	Diverged	Diverged	Till 2015 - UVLS will drop 1 load block and will mitigate the issue. 2015 onwards - Operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency so that the next 230kV line (N-1) will result in consequential loss of load.
VEA-SP-VD-12	18296 VISTA 138 kV	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C3	N-1-1	-21%	Diverged	Diverged	Till 2015 - UVLS will drop 1 load block and will mitigate the issue. 2015 onwards - Operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency so that the next 230kV line (N-1) will result in consequential loss of load.

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ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	
VEA-SP-VD-13	18910 INNOVATION 230 kV	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C3	N-1-1	-26%	Diverged	Diverged	Till 2015 - UVLS will drop 1 load block and will mitigate the issue. 2015 onwards - Operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency so that the next 230kV line (N-1) will result in consequential loss of load.
VEA-SP-VD-14	18924 GAMEBIRD 138 kV	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C3	N-1-1	-21%	Diverged	Diverged	Till 2015 - UVLS will drop 1 load block and will mitigate the issue. 2015 onwards - Operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency so that the next 230kV line (N-1) will result in consequential loss of load.
VEA-SP-VD-15	18928 THSNDAIR 138 kV	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C3	N-1-1	-21%	Diverged	Diverged	Till 2015 - UVLS will drop 1 load block and will mitigate the issue. 2015 onwards - Operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency so that the next 230kV line (N-1) will result in consequential loss of load.

**Voltage Deviations**

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	
VEA-SP-VD-16	18932 CHARLSTN 138 kV	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C3	N-1-1	-21%	Diverged	Diverged	Till 2015 - UVLS will drop 1 load block and will mitigate the issue. 2015 onwards - Operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency so that the next 230kV line (N-1) will result in consequential loss of load.
VEA-SP-VD-17	18911 INNOVATION 138 kV	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C3	N-1-1	-17%	Diverged	Diverged	Till 2015 - UVLS will drop 1 load block and will mitigate the issue. 2015 onwards - Operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency so that the next 230kV line (N-1) will result in consequential loss of load.
VEA-SP-VD-18	18913 JOHNNIE 138 kV	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C3	N-1-1	-21%	Diverged	Diverged	Till 2015 - UVLS will drop 1 load block and will mitigate the issue. 2015 onwards - Operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency so that the next 230kV line (N-1) will result in consequential loss of load.
VEA-SP-VD-19	18296 VISTA 138 kV	PAHRUMP -VISTA 138-kV Ckt 1 _GAMEBIRD -THSNDAIR 138-kV Ckt 1	C3	N-1-1	-14%	-14%	Diverged	Open Charleston - Thousandaire 138kV line after the first N-1
VEA-SP-VD-20	18928 THSNDAIR 138 kV	PAHRUMP -VISTA 138-kV Ckt 1 _GAMEBIRD -THSNDAIR 138-kV Ckt 1	C3	N-1-1	-16%	-16%	Diverged	Open Charleston - Thousandaire 138kV line after the first N-1
VEA-SP-VD-21	18932 CHARLSTN 138 kV	PAHRUMP -VISTA 138-kV Ckt 1 _GAMEBIRD -THSNDAIR 138-kV Ckt 1	C3	N-1-1	-15%	-15%	Diverged	Open Charleston - Thousandaire 138kV line after the first N-1

## 2013/2014 ISO Reliability Assessment - 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
					2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	
VEA-SP-VD-22	18913 JOHNNIE 138 kV	PAHRUMP -VISTA 138-kV Ckt 1 _GAMEBIRD -THSND AIR 138-kV Ckt 1	C3	N-1-1	-13%	-13%	Diverged	Open Charleston - Thousandaire 138kV line after the first N-1

## Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2015 Summer Off-Peak	2018 Summer Light Load	N/A	
VEA-NP-VD-1	18919 CRAZY EYE SS 230 kV	CRAZY EYE SS -BOB SS 230-kV Ckt 1 _INNOVATION -DESERT VIEW 230-kV Ckt 1	C3	N-1-1	-14%	9%		Lock/adjust the 230/138kV and 138/24kV taps after the first N-1 or set the UVLS to monitor HV side
VEA-NP-VD-2	18919 CRAZY EYE SS 230 kV	CRAZY EYE SS -BOB SS 230-kV Ckt 1 _PAHRUMP -INNOVATION 230-kV Ckt 1	C3	N-1-1	-14%	-14%		Lock/adjust the 230/138kV and 138/24kV taps after the first N-1 or set the UVLS to monitor HV side
VEA-NP-VD-3	18919 CRAZY EYE SS 230 kV	NWEST -DESERT VIEW 230-kV Ckt 1 _CRAZY EYE SS -BOB SS 230-kV Ckt 1	C3	N-1-1	-14%	9%		Lock/adjust the 230/138kV and 138/24kV taps after the first N-1 or set the UVLS to monitor HV side
VEA-NP-VD-4	18910 INNOVATION 230 kV	CRAZY EYE SS -BOB SS 230-kV Ckt 1 _INNOVATION -DESERT VIEW 230-kV Ckt 1	C3	N-1-1	-14%	9%		Lock/adjust the 230/138kV and 138/24kV taps after the first N-1 or set the UVLS to monitor HV side
VEA-NP-VD-5	18910 INNOVATION 230 kV	NWEST -DESERT VIEW 230-kV Ckt 1 _CRAZY EYE SS -BOB SS 230-kV Ckt 1	C3	N-1-1	-14%	9%		Lock/adjust the 230/138kV and 138/24kV taps after the first N-1 or set the UVLS to monitor HV side
VEA-NP-VD-6	18910 INNOVATION 230 kV	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C3	N-1-1	-15%	-14%		Lock/adjust the 230/138kV and 138/24kV taps after the first N-1 or set the UVLS to monitor HV side
VEA-NP-VD-7	18910 INNOVATION 230 kV	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -INNOVATION 230-kV Ckt 1	C3	N-1-1	-11%	3%		Lock/adjust the 230/138kV and 138/24kV taps after the first N-1 or set the UVLS to monitor HV side
VEA-NP-VD-8	18910 INNOVATION 230 kV	PAHRUMP -CRAZY EYE SS 230-kV Ckt 1 _INNOVATION -DESERT VIEW 230-kV Ckt 1	C3	N-1-1	-15%	-14%		Lock/adjust the 230/138kV and 138/24kV taps after the first N-1 or set the UVLS to monitor HV side
VEA-NP-VD-9	18910 INNOVATION 230 kV	PAHRUMP -INNOVATION 230-kV Ckt 1 _INNOVATION -DESERT VIEW 230-kV Ckt 1	C3	N-1-1	-11%	1%		Lock/adjust the 230/138kV and 138/24kV taps after the first N-1 or set the UVLS to monitor HV side
VEA-NP-VD-10	18023 PAHRUMP 230 kV	CRAZY EYE SS -BOB SS 230-kV Ckt 1 _INNOVATION -DESERT VIEW 230-kV Ckt 1	C3	N-1-1	-14%	9%		Lock/adjust the 230/138kV and 138/24kV taps after the first N-1 or set the UVLS to monitor HV side

**Voltage Deviations**

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2015 Summer Off-Peak	2018 Summer Light Load	N/A	
VEA-NP-VD-11	18023 PAHRUMP 230 kV	CRAZY EYE SS -BOB SS 230-kV Ckt 1 _PAHRUMP -INNOVATION 230-kV Ckt 1	C3	N-1-1	-14%	-14%		Lock/adjust the 230/138kV and 138/24kV taps after the first N-1 or set the UVLS to monitor HV side
VEA-NP-VD-12	18023 PAHRUMP 230 kV	NWEST -DESERT VIEW 230-kV Ckt 1 _CRAZY EYE SS -BOB SS 230-kV Ckt 1	C3	N-1-1	-14%	9%		Lock/adjust the 230/138kV and 138/24kV taps after the first N-1 or set the UVLS to monitor HV side
VEA-NP-VD-13	18023 PAHRUMP 230 kV	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C3	N-1-1	-15%	-14%		Lock/adjust the 230/138kV and 138/24kV taps after the first N-1 or set the UVLS to monitor HV side
VEA-NP-VD-14	18023 PAHRUMP 230 kV	PAHRUMP -CRAZY EYE SS 230-kV Ckt 1 _INNOVATION -DESERT VIEW 230-kV Ckt 1	C3	N-1-1	-15%	-14%		Lock/adjust the 230/138kV and 138/24kV taps after the first N-1 or set the UVLS to monitor HV side
VEA-NP-VD-15	18023 PAHRUMP 230 kV	PAHRUMP -CRAZY EYE SS 230-kV Ckt 1 _PAHRUMP -INNOVATION 230-kV Ckt 1	C3	N-1-1	-15%	-15%		Lock/adjust the 230/138kV and 138/24kV taps after the first N-1 or set the UVLS to monitor HV side

# 2013/2014 ISO Reliability Assessment - Study Results

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

High/Low Voltage



ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	
VEA-SP-V-1	18023 PAHRUMP 230 kV	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C3	N-1-1	0.74	Diverged	Diverged	Till 2015 - UVLS will drop 1 load block and will mitigate the issue. 2015 onwards - Operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency so that the next 230kV line (N-1) will result in consequential loss of load.
VEA-SP-V-2	18036 BEATTY 138 kV	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C3	N-1-1	0.83	Diverged	Diverged	Till 2015 - UVLS will drop 1 load block and will mitigate the issue. 2015 onwards - Operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency so that the next 230kV line (N-1) will result in consequential loss of load.
VEA-SP-V-3	18076 LTHRPWLS 138 kV	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C3	N-1-1	0.83	Diverged	Diverged	Till 2015 - UVLS will drop 1 load block and will mitigate the issue. 2015 onwards - Operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency so that the next 230kV line (N-1) will result in consequential loss of load.

# 2013/2014 ISO Reliability Assessment - Study Results

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

High/Low Voltage



ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	
VEA-SP-V-4	18085 PAHRUMP 138 kV	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C3	N-1-1	0.82	Diverged	Diverged	Till 2015 - UVLS will drop 1 load block and will mitigate the issue. 2015 onwards - Operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency so that the next 230kV line (N-1) will result in consequential loss of load.
VEA-SP-V-5	18098 SANDY 138 kV	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C3	N-1-1	0.85	Diverged	Diverged	Till 2015 - UVLS will drop 1 load block and will mitigate the issue. 2015 onwards - Operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency so that the next 230kV line (N-1) will result in consequential loss of load.
VEA-SP-V-6	18111 VALLEYVE 138 kV	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C3	N-1-1	0.83	Diverged	Diverged	Till 2015 - UVLS will drop 1 load block and will mitigate the issue. 2015 onwards - Operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency so that the next 230kV line (N-1) will result in consequential loss of load.

# 2013/2014 ISO Reliability Assessment - Study Results

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

High/Low Voltage



ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	
VEA-SP-V-7	18113 VALLEYTP 138 kV	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C3	N-1-1	0.83	Diverged	Diverged	Till 2015 - UVLS will drop 1 load block and will mitigate the issue. 2015 onwards - Operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency so that the next 230kV line (N-1) will result in consequential loss of load.
VEA-SP-V-8	18296 VISTA 138 kV	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C3	N-1-1	0.81	Diverged	Diverged	Till 2015 - UVLS will drop 1 load block and will mitigate the issue. 2015 onwards - Operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency so that the next 230kV line (N-1) will result in consequential loss of load.
VEA-SP-V-9	18910 INNOVATION 230 kV	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C3	N-1-1	0.75	Diverged	Diverged	Till 2015 - UVLS will drop 1 load block and will mitigate the issue. 2015 onwards - Operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency so that the next 230kV line (N-1) will result in consequential loss of load.

# 2013/2014 ISO Reliability Assessment - Study Results

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

High/Low Voltage



ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	
VEA-SP-V-10	18924 GAMEBIRD 138 kV	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C3	N-1-1	0.82	Diverged	Diverged	Till 2015 - UVLS will drop 1 load block and will mitigate the issue. 2015 onwards - Operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency so that the next 230kV line (N-1) will result in consequential loss of load.
VEA-SP-V-11	18928 THSND AIR 138 kV	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C3	N-1-1	0.81	Diverged	Diverged	Till 2015 - UVLS will drop 1 load block and will mitigate the issue. 2015 onwards - Operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency so that the next 230kV line (N-1) will result in consequential loss of load.
VEA-SP-V-12	18932 CHARLSTN 138 kV	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C3	N-1-1	0.81	Diverged	Diverged	Till 2015 - UVLS will drop 1 load block and will mitigate the issue. 2015 onwards - Operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency so that the next 230kV line (N-1) will result in consequential loss of load.

# 2013/2014 ISO Reliability Assessment - Study Results

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

High/Low Voltage



ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	
VEA-SP-V-13	18911 INNOVATION 138 kV	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C3	N-1-1	0.85	Diverged	Diverged	Till 2015 - UVLS will drop 1 load block and will mitigate the issue. 2015 onwards - Operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency so that the next 230kV line (N-1) will result in consequential loss of load.
VEA-SP-V-14	18913 JOHNNIE 138 kV	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C3	N-1-1	0.82	Diverged	Diverged	Till 2015 - UVLS will drop 1 load block and will mitigate the issue. 2015 onwards - Operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency so that the next 230kV line (N-1) will result in consequential loss of load.
VEA-SP-V-15	18296 VISTA 138 kV	PAHRUMP -VISTA 138-kV Ckt 1 _GAMEBIRD -THSNDAIR 138-kV Ckt 1	C3	N-1-1	0.88	0.88	Diverged	Open Charleston - Thousandaire 138kV line after the first N-1
VEA-SP-V-16	18928 THSNDAIR 138 kV	PAHRUMP -VISTA 138-kV Ckt 1 _GAMEBIRD -THSNDAIR 138-kV Ckt 1	C3	N-1-1	0.86	0.86	Diverged	Open Charleston - Thousandaire 138kV line after the first N-1
VEA-SP-V-17	18932 CHARLSTN 138 kV	PAHRUMP -VISTA 138-kV Ckt 1 _GAMEBIRD -THSNDAIR 138-kV Ckt 1	C3	N-1-1	0.87	0.87	Diverged	Open Charleston - Thousandaire 138kV line after the first N-1
VEA-SP-V-18	18913 JOHNNIE 138 kV	PAHRUMP -VISTA 138-kV Ckt 1 _GAMEBIRD -THSNDAIR 138-kV Ckt 1	C3	N-1-1	0.89	0.89	Diverged	Open Charleston - Thousandaire 138kV line after the first N-1

# 2013/2014 ISO Reliability Assessment - 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
					2015 Summer Off-Peak	2018 Summer Light Load	N/A	
VEA-NP-V-1	18023 PAHRUMP 230 kV	Base system (n-0)	A	N-0	1.01	1.06		Adjust taps on Amargosa 230/115 kV transformer and Eldorado 500/230kV transformer
VEA-NP-V-2	18910 INNOVATION 230 kV	Base system (n-0)	A	N-0	1.01	1.05		Adjust taps on Amargosa 230/115 kV transformer and Eldorado 500/230kV transformer
VEA-NP-V-3	18909 BOB SS 230 kV	Base system (n-0)	A	N-0	1.02	1.05		Adjust taps on Amargosa 230/115 kV transformer and Eldorado 500/230kV transformer
VEA-NP-V-4	18919 CRAZY EYE SS 230 kV	Base system (n-0)	A	N-0	1.02	1.06		Adjust taps on Amargosa 230/115 kV transformer and Eldorado 500/230kV transformer
VEA-NP-V-5	18023 PAHRUMP 230 kV	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C3	N-1-1	0.86	0.91		Lock/adjust the 230/138kV and 138/24kV taps after the first N-1 or set the UVLS to monitor HV side
VEA-NP-V-6	18023 PAHRUMP 230 kV	NWEST -DESERT VIEW 230-kV Ckt 1 _CRAZY EYE SS -BOB SS 230-kV Ckt 1	C3	N-1-1	0.87	1.15		Lock/adjust the 230/138kV and 138/24kV taps after the first N-1 or set the UVLS to monitor HV side
VEA-NP-V-7	18023 PAHRUMP 230 kV	PAHRUMP -CRAZY EYE SS 230-kV Ckt 1 _PAHRUMP -INNOVATION 230-kV Ckt 1	C3	N-1-1	0.87	0.90		Lock/adjust the 230/138kV and 138/24kV taps after the first N-1 or set the UVLS to monitor HV side
VEA-NP-V-8	18023 PAHRUMP 230 kV	PAHRUMP -CRAZY EYE SS 230-kV Ckt 1 _INNOVATION -DESERT VIEW 230-kV Ckt 1	C3	N-1-1	0.86	0.91		Lock/adjust the 230/138kV and 138/24kV taps after the first N-1 or set the UVLS to monitor HV side
VEA-NP-V-9	18023 PAHRUMP 230 kV	CRAZY EYE SS -BOB SS 230-kV Ckt 1 _PAHRUMP -INNOVATION 230-kV Ckt 1	C3	N-1-1	0.88	0.91		Lock/adjust the 230/138kV and 138/24kV taps after the first N-1 or set the UVLS to monitor HV side
VEA-NP-V-10	18023 PAHRUMP 230 kV	CRAZY EYE SS -BOB SS 230-kV Ckt 1 _INNOVATION -DESERT VIEW 230-kV Ckt 1	C3	N-1-1	0.87	1.15		Lock/adjust the 230/138kV and 138/24kV taps after the first N-1 or set the UVLS to monitor HV side

# 2013/2014 ISO Reliability Assessment - 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
					2015 Summer Off-Peak	2018 Summer Light Load	N/A	
VEA-NP-V-11	18910 INNOVATION 230 kV	NWEST -DESERT VIEW 230-kV Ckt 1 _PAHRUMP -CRAZY EYE SS 230-kV Ckt 1	C3	N-1-1	0.87	0.91		Lock/adjust the 230/138kV and 138/24kV taps after the first N-1 or set the UVLS to monitor HV side
VEA-NP-V-12	18910 INNOVATION 230 kV	NWEST -DESERT VIEW 230-kV Ckt 1 _CRAZY EYE SS -BOB SS 230-kV Ckt 1	C3	N-1-1	0.88	1.15		Lock/adjust the 230/138kV and 138/24kV taps after the first N-1 or set the UVLS to monitor HV side
VEA-NP-V-13	18910 INNOVATION 230 kV	PAHRUMP -CRAZY EYE SS 230-kV Ckt 1 _INNOVATION -DESERT VIEW 230-kV Ckt 1	C3	N-1-1	0.87	0.91		Lock/adjust the 230/138kV and 138/24kV taps after the first N-1 or set the UVLS to monitor HV side
VEA-NP-V-14	18910 INNOVATION 230 kV	CRAZY EYE SS -BOB SS 230-kV Ckt 1 _INNOVATION -DESERT VIEW 230-kV Ckt 1	C3	N-1-1	0.88	1.15		Lock/adjust the 230/138kV and 138/24kV taps after the first N-1 or set the UVLS to monitor HV side



Single Contingency Load Drop

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

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
				Select..	Select..	Select..	

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



ID	Substation	Load Served (MW)			Potential Mitigation Solutions
		Select..	Select..	Select..	

No single source substation with more than 100 MW Load

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
		Select..	Select..	Select..	

No single source substation with more than 100 MW Load