

Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)									Loading % (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2026 Summer Peak	2029 Summer Peak	2034 Summer Peak	2039 Summer Peak	2026 Spring Off-Peak	2029 Spring Off-Peak	2034 Winter Peak	2026 SP with Forecasted Load Addition	2029 SP with Forecasted Load Addition	2026 OP BESS Charging			
Amargosa 230/138kV Transformer	PAHRUMP 230.0 to INNOVATION 230.0 Circuit GAMEBIRD 230.0 to TROUT CANYON 230.0 Circuit 1	P6	N-1-1	118	<100	<100	<100	<100	<100	<100	<100	136	<100	<100	Existing UVLS scheme. The GLW core upgrades will mitigate the overload in the long term.	
Amargosa 230/138kV Transformer	TROUT CANYON 500.0 to SLOAN_CYN_5 500.0 Circuit 1 TROUT CANYON 500.0 to SLOAN_CYN_5 500.0 Circuit 2	P7	DCTL	<100	<100	<100	110	<100	<100	<100	<100	<100	<100	<100	Future Trout Canyon RAS, trip approximately 1,400MW installed capacity generation at Trout Canyon.	
CANYON 138 18102 SNOW MTN 138	GAMEBIRD 230.0 to TROUT CANYON 230.0 Circuit 1 INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1	P6	N-1-1	126	<100	<100	<100	<100	<100	<100	<100	143	<100	<100	Existing UVLS scheme. The GLW core upgrades will mitigate the overload in the long term.	
CANYON 138 18102 SNOW MTN 138	TROUT CANYON 500.0 to SLOAN_CYN_5 500.0 Circuit 1 TROUT CANYON 500.0 to SLOAN_CYN_5 500.0 Circuit 2	P7	DCTL	<100	<100	<100	135	<100	<100	<100	<100	<100	<100	<100	Future Trout Canyon RAS, trip approximately 1,400MW installed capacity generation at Trout Canyon.	
CANYON 138 18698 SIL FLG 138	GAMEBIRD 230.0 to TROUT CANYON 230.0 Circuit 1 INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1	P6	N-1-1	124	<100	<100	<100	<100	<100	<100	<100	142	<100	<100	Existing UVLS scheme. The GLW core upgrades will mitigate the overload in the long term.	
CANYON 138 18698 SIL FLG 138	TROUT CANYON 500.0 to SLOAN_CYN_5 500.0 Circuit 1 TROUT CANYON 500.0 to SLOAN_CYN_5 500.0 Circuit 2	P7	DCTL	<100	<100	<100	136	<100	<100	<100	<100	<100	<100	<100	Future Trout Canyon RAS, trip approximately 1,400MW installed capacity generation at Trout Canyon.	
COLDCREK 138 18091 RADAR 138	GAMEBIRD 230.0 to TROUT CANYON 230.0 Circuit 1 INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1	P6	N-1-1	118	<100	<100	<100	<100	<100	<100	<100	135	<100	<100	Existing UVLS scheme. The GLW core upgrades will mitigate the overload in the long term.	
COLDCREK 138 18091 RADAR 138	TROUT CANYON 500.0 to SLOAN_CYN_5 500.0 Circuit 1 TROUT CANYON 500.0 to SLOAN_CYN_5 500.0 Circuit 2	P7	DCTL	<100	<100	<100	139	<100	<100	<100	<100	<100	<100	<100	Future Trout Canyon RAS, trip approximately 1,400MW installed capacity generation at Trout Canyon.	
IS TAP 138 18091 RADAR 138	GAMEBIRD 230.0 to TROUT CANYON 230.0 Circuit 1 INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1	P6	N-1-1	116	<100	<100	<100	<100	<100	<100	<100	133	<100	<100	Existing UVLS scheme. The GLW core upgrades will mitigate the overload in the long term.	
IS TAP 138 18091 RADAR 138	TROUT CANYON 500.0 to SLOAN_CYN_5 500.0 Circuit 1 TROUT CANYON 500.0 to SLOAN_CYN_5 500.0 Circuit 2	P7	DCTL	<100	<100	<100	141	<100	<100	<100	<100	<100	<100	<100	Future Trout Canyon RAS, trip approximately 1,400MW installed capacity generation at Trout Canyon.	
IS TAP 138 189101 MERCURY 138	GAMEBIRD 230.0 to TROUT CANYON 230.0 Circuit 1 INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1	P6	N-1-1	106	NA	NA	NA	<100	NA	NA	NA	123	NA	<100	Existing UVLS scheme. The GLW core upgrades will mitigate the overload in the long term.	
NWEST 138 18102 SNOW MTN 138 1	GAMEBIRD 230.0 to TROUT CANYON 230.0 Circuit 1 INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1	P6	N-1-1	127	<100	<100	<100	<100	<100	<100	<100	144	<100	<100	Existing UVLS scheme. The GLW core upgrades will mitigate the overload in the long term.	
NWEST 138 18102 SNOW MTN 138 1	TROUT CANYON 500.0 to SLOAN_CYN_5 500.0 Circuit 1 TROUT CANYON 500.0 to SLOAN_CYN_5 500.0 Circuit 2	P7	DCTL	<100	<100	<100	133	<100	<100	<100	<100	<100	<100	<100	Future Trout Canyon RAS, trip approximately 1,400MW installed capacity generation at Trout Canyon.	
SIL FLG 138 18050 COLDCREK 138 1	GAMEBIRD 230.0 to TROUT CANYON 230.0 Circuit 1 INNOVATION 230.0 to DESERT VIEW 230.0 Circuit 1	P6	N-1-1	124	<100	<100	<100	<100	<100	<100	<100	141	<100	<100	Existing UVLS scheme. The GLW core upgrades will mitigate the overload in the long term.	
SIL FLG 138 18050 COLDCREK 138 1	TROUT CANYON 500.0 to SLOAN_CYN_5 500.0 Circuit 1 TROUT CANYON 500.0 to SLOAN_CYN_5 500.0 Circuit 2	P7	DCTL	<100	<100	<100	137	<100	<100	<100	<100	<100	<100	<100	Future Trout Canyon RAS, trip approximately 1,400MW installed capacity generation at Trout Canyon.	
Remaining Pahrump 230/138kV Transformer	One Pahrump 230/138kV transformer Gamebird 230/138kV transformer	P6	N-1-1	<100	105	141	<100	<100	<100	<100	<100	<100	124	<100	Existing UVLS scheme.	
GAMEBIRD 230 189160 TROUT CANYON 230 1	Eldorado2 230/500-kV Tran Bnk 5 MEAD S 230.0 to SLOAN CANYON 230.0 Circuit 1	P6	N-1-1	153	<100	<100	<100	<100	<100	<100	<100	154	<100	<100	System adjustments, Gen redispatch. The GLW core upgrades will mitigate the overload in the long term.	
TROUT CANYON 230 189040 SLOAN CANYON 230 1	Eldorado2 230/500-kV Tran Bnk 5 MEAD S 230.0 to SLOAN CANYON 230.0 Circuit 1	P6	N-1-1	129	<100	<100	<100	<100	<100	<100	<100	129	<100	<100	System adjustments, Gen redispatch. The GLW core upgrades will mitigate the overload in the long term.	
VEA PST-IS Tap 138kV Line	PAHRUMP 138.0 to VISTA 138.0 Circuit 1 Tran INNOVATION 230.00 to INNOVATION 138.00	P6	N-1-1	<100	<100	<100	<100	<100	<100	120	<100	<100	<100	<100	System adjustments, Gen redispatch	
VEA_PST_2 138 18073 IS TAP 138 1 1	TROUT CANYON 500.0 to SLOAN_CYN_5 500.0 Circuit 1 TROUT CANYON 500.0 to SLOAN_CYN_5 500.0 Circuit 2	P7	DCTL	<100	<100	<100	150	<100	<100	<100	<100	<100	<100	<100	Future Trout Canyon RAS, trip approximately 1,400MW installed capacity generation at Trout Canyon.	
AMARGOSA 138 189008 SANDY 138 1	TROUT CANYON 500.0 to SLOAN_CYN_5 500.0 Circuit 1 TROUT CANYON 500.0 to SLOAN_CYN_5 500.0 Circuit 2	P7	DCTL	<100	<100	<100	146	<100	<100	<100	<100	<100	<100	<100	Future Trout Canyon RAS, trip approximately 1,400MW installed capacity generation at Trout Canyon.	
SANDY 138 189020 GAMEBIRD 138 1	TROUT CANYON 500.0 to SLOAN_CYN_5 500.0 Circuit 1 TROUT CANYON 500.0 to SLOAN_CYN_5 500.0 Circuit 2	P7	DCTL	<100	<100	<100	127	<100	<100	<100	<100	<100	<100	<100	Future Trout Canyon RAS, trip approximately 1,400MW installed capacity generation at Trout Canyon.	
Gamebird 230/138kV Transformer	TROUT CANYON 500.0 to SLOAN_CYN_5 500.0 Circuit 1 TROUT CANYON 500.0 to SLOAN_CYN_5 500.0 Circuit 2	P7	DCTL	<100	<100	<100	164	<100	<100	<100	<100	<100	<100	<100	Future Trout Canyon RAS, trip approximately 1,400MW installed capacity generation at Trout Canyon.	
Gamebird 230/138kV Transformer	Two Pahrump 230/138kV transformers	P7	DCTL	<100	<100	<100	120	<100	<100	<100	<100	<100	<100	<100	Existing UVLS scheme, System adjustments	
System	NWEST 230.0 to DESERT VIEW 230.0 Circuit 1 TROUT CANYON 230.0 to SLOAN CANYON 230.0 Circuit 1	P6	N-1-1	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	Diverge	System adjustments	
System	Eldorado2 230/500-kV Tran Bnk 5 ELDORADO2 230.0 to SLOAN CANYON 230.0 Circuit 1	P6	N-1-1	Diverge	<100	Diverge	<100	<100	<100	Diverge	<100	Diverge	Diverge	<100	Ivanpah RAS System adjustments, Gen redispatch	

Substation	Contingency (All and Worst P6)	Category	Category Description	High/Low Voltage	Voltage PU (Baseline Scenarios)							Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
					2026 Summer Peak	2029 Summer Peak	2034 Summer Peak	2039 Summer Peak	2026 Spring Off-Peak	2029 Spring Off-Peak	2034 Winter Peak	2026 SP with Forecasted Load Addition	2029 SP with Forecasted Load Addition	2026 OP BESS Charging	
Gamebird, Charleston, Thousandaire, Sandy 138kV	Gamebird-Parhump 138kV line and Gamebird 230/138kV transformer	P6	N-1-1	Low Voltage	<0.9	<0.9	<0.9	<0.9	0.9<P.U.<1.1	<0.9	0.9<P.U.<1.1	<0.9	<0.9	0.9<P.U.<1.1	Existing UVLS scheme
Pahrump 230kV, Gamebird 230kV	Gamebird-Trout Canyon 230kV and Parhump-Innovation 230kV lines	P6	N-1-1	Low Voltage	<0.9	0.9<P.U.<1.1	0.9<P.U.<1.1	0.9<P.U.<1.1	<0.9	0.9<P.U.<1.1	0.9<P.U.<1.1	0.9<P.U.<1.1	<0.9	<0.9	Short term: Existing UVLS scheme Long term: Previously approved GLW Core Upgrade
Pahrump, Gamebird, Charleston, Thousandaire, Sandy, Vista 138kV	Gamebird-Trout Canyon 230kV and Parhump-Innovation 230kV lines	P6	N-1-1	Low Voltage	<0.9	0.9<P.U.<1.1	0.9<P.U.<1.1	0.9<P.U.<1.1	<0.9	0.9<P.U.<1.1	0.9<P.U.<1.1	0.9<P.U.<1.1	<0.9	<0.9	Short term: Existing UVLS scheme Long term: Previously approved GLW Core Upgrade

Substation	Contingency (All and Worst P6)	Category	Category Description	Post Cont. Voltage Deviation % (Baseline Scenarios)						Post Cont. Voltage Deviation % (Sensitivity Scenarios)			Project & Potential Mitigation Solutions	
				2026 Summer Peak	2029 Summer Peak	2034 Summer Peak	2039 Summer Peak	2026 Spring Off-Peak	2029 Spring Off-Peak	2034 Winter Peak	2026 SP with Forecasted Load Addition	2029 SP with Forecasted Load Addition		2026 OP BESS Charging

No P1 or P3 contingencies resulted in voltage deviation greater than 8%

Contingency	Category	Category Description	Transient Stability Performance					Potential Mitigation Solutions
			Baseline Scenarios			Sensitivity Scenarios		
			2026 Spring Off-Peak	2029 Summer Peak	2034 Summer Peak	2026 OP BESS Charging	2029 SP with Forecasted Load Addition	
Amargosa-Sandy 138kV (fault at Amargosa)	P1	Normal clearing	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	
Pahrump-Vista 138kV (fault at Pahrump)	P1	Normal clearing	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	
Pahrump-Gamebird 138kV (fault at Pahrump)	P1	Normal clearing	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	
Vista-Johnnie-Valley 138kV (fault at Vista)	P1	Normal clearing	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	
Vista-Johnnie 230kV (fault at Vista)	P1	Normal clearing	N/A	Stable/WECC criteria met	Unstable	N/A	Stable/WECC criteria met	Under review with PTO
Vista-Pahrump 230kV (fault at Vista)	P1	Normal clearing	N/A	Stable/WECC criteria met	Unstable	N/A	Stable/WECC criteria met	Under review with PTO
Lathrop Wells-Valley TP 230kV (fault at Lathrop Wells)	P1	Normal clearing	N/A	Stable/WECC criteria met	Unstable	N/A	Stable/WECC criteria met	Under review with PTO
Lathrop Wells 138kV bus fault	P1	Normal clearing	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	
Sandy 138kV bus fault	P1	Normal clearing	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	
Valley 138kV bus fault	P1	Normal clearing	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	
Valley Switch 138kV bus fault	P1	Normal clearing	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	
Pahrump-Vista 138kV & Pahrump-Gamebird 138kV	P4.2	Stuck breaker	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	
Pahrump 230/138kV No.2 & Pahrump-Vista 138kV	P4.2	Stuck breaker	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	
Pahrump 230/138kV No.1 & Pahrump-Gamebird 138kV	P4.2	Stuck breaker	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	
Pahrump 230/138kV No.1 & Pahrump-Gamebird 230kV	P4.2	Stuck breaker	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	
Pahrump 230/138kV No.2 & Pahrump-Vista 230kV	P4.2	Stuck breaker	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	
Pahrump-Gamebird 230kV No.2 & Trout Canyon-Gamebird 230kV No.2	P4.2	Stuck breaker	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	
Sloan Canyon 500/230kV transformer & Sloan Canyon-Eldorado 230kV	P4.2	Stuck breaker	N/A	Stable/WECC criteria met	Stable/WECC criteria met	N/A	Stable/WECC criteria met	
Innovation-Desert View 230kV No.1 & Innovation 230/138kV transformer	P4.2	Stuck breaker	N/A	Stable/WECC criteria met	Stable/WECC criteria met	N/A	Stable/WECC criteria met	
Innovation-Johnnie 230kV No.1 & Innovation 230/138kV transformer	P4.2	Stuck breaker	N/A	Stable/WECC criteria met	Stable/WECC criteria met	N/A	Stable/WECC criteria met	
Sloan Canyon-Eldorado 500kV & Trout Canyon-Sloan Canyon 500kV No.1	P4.2	Stuck breaker	N/A	Stable/WECC criteria met	Stable/WECC criteria met	N/A	Stable/WECC criteria met	
Sloan Canyon-Harry Allen 500kV & Trout Canyon-Sloan Canyon 500kV No.2	P4.2	Stuck breaker	N/A	Stable/WECC criteria met	Stable/WECC criteria met	N/A	Stable/WECC criteria met	
Trout Canyon 500/230kV No.1&Trout Canyon-Sloan Canyon 500kV No.1	P4.2	Stuck breaker	N/A	Stable/WECC criteria met	Stable/WECC criteria met	N/A	Stable/WECC criteria met	
Trout Canyon 500/230kV No.2 & Trout Canyon-Gamebird 230kV No.2	P4.2	Stuck breaker	N/A	Stable/WECC criteria met	Stable/WECC criteria met	N/A	Stable/WECC criteria met	
Johnnie-Pahrump 230kV & Johnnie-Innovation 230kV	P4.2	Stuck breaker	N/A	Stable/WECC criteria met	Stable/WECC criteria met	N/A	Stable/WECC criteria met	
Johnnie-Vista 230kV & Johnnie-Valley TP 230kV	P4.2	Stuck breaker	N/A	Stable/WECC criteria met	Stable/WECC criteria met	N/A	Stable/WECC criteria met	
Valley TP-Lathrop Wells 230kV & Valley TP-Johnnie 230kV	P4.2	Stuck breaker	N/A	Stable/WECC criteria met	Unstable	N/A	Stable/WECC criteria met	Under review with PTO
Desert View 230kV	P5	Non-redundant Relay	Stable/WECC criteria met	N/A	Unstable	Stable/WECC criteria met	N/A	Under review with PTO
Gamebird-Sandy & Thousandaire-Gamebird 138kV	P6	Normal clearing	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	
Gamebird-Pahrump 138kV & Gamebird 230/138kV transformer	P6	Normal clearing	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	
Pahrump-Innovation & Pahrump-Gamebird 230kV	P6	Normal clearing	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	
Nwest-Desert View & Pahrump-Gamebird 230kV	P6	Normal clearing	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	
Sloan Canyon-Eldorado & Sloan Canyon-Mead 230kV	P6	Normal clearing	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	
Pahrump-Gamebird 230kV Nos.1&2	P7	Normal clearing	N/A	Stable/WECC criteria met	Stable/WECC criteria met	N/A	Stable/WECC criteria met	
Innovation-Desert View 230kV Nos.1&2	P7	Normal clearing	N/A	Stable/WECC criteria met	Stable/WECC criteria met	N/A	Stable/WECC criteria met	
Trout Canyon-Sloan Canyon 500kV Nos.1&2	P7	Normal clearing	N/A	Stable/WECC criteria met	Stable/WECC criteria met	N/A	Stable/WECC criteria met	
Trout Canyon-Gamebird 230kV Nos.1&2	P7	Normal clearing	N/A	Stable/WECC criteria met	Stable/WECC criteria met	N/A	Stable/WECC criteria met	
Desert View-Northwest 230kV Nos.1&2	P7	Normal clearing	N/A	Stable/WECC criteria met	Stable/WECC criteria met	N/A	Stable/WECC criteria met	
Innovation-Johnnie 230kV Nos.1&2	P7	Normal clearing	N/A	Stable/WECC criteria met	Stable/WECC criteria met	N/A	Stable/WECC criteria met	
Valley TP-Johnnie 230kV Nos.1&2	P7	Normal clearing	N/A	Stable/WECC criteria met	Stable/WECC criteria met	N/A	Stable/WECC criteria met	
Valley TP-Lathrop Wells 230kV Nos.1&2	P7	Normal clearing	N/A	Stable/WECC criteria met	Stable/WECC criteria met	N/A	Stable/WECC criteria met	
Pahrump-Gamebird 230kV & Pahrump-Gamebird 138kV	P7	Normal clearing	Stable/WECC criteria met	N/A	N/A	Stable/WECC criteria met	N/A	
Pahrump-Gamebird 230kV & Gamebird-Sandy 138kV	P7	Normal clearing	Stable/WECC criteria met	N/A	N/A	Stable/WECC criteria met	N/A	
Pahrump-Innovation 230kV & Pahrump-Vista 138kV	P7	Normal clearing	Stable/WECC criteria met	N/A	N/A	Stable/WECC criteria met	N/A	
Pahrump-Innovation 230kV & Vista-ValleySS 138kV	P7	Normal clearing	Stable/WECC criteria met	N/A	N/A	Stable/WECC criteria met	N/A	

Worst Contingency	Category	Category Description	Amount of Load Drop (MW)									Potential Mitigation Solutions	
			2026 Summer Peak	2029 Summer Peak	2034 Summer Peak	2039 Summer Peak	2026 Spring Off-Peak	2029 Spring Off-Peak	2034 Winter Peak	2026 SP with Forecasted Load Addition	2029 SP with Forecasted Load Addition		2026 OP BESS Charging

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

2024-2025 ISO Reliability Assessment - Preliminary Study Results

Study Area: **Valley Electric Association**

*Single Source Substation with more than 100 MW Load*



Substation	Load Served (MW)									Potential Mitigation Solutions	
	2026 Summer Peak	2029 Summer Peak	2034 Summer Peak	2039 Summer Peak	2026 Spring Off-Peak	2029 Spring Off-Peak	2034 Winter Peak	2026 SP with Forecasted Load Addition	2029 SP with Forecasted Load Addition		2026 OP BESS Charging

No single source substation with more than 100 MW