

What To Do If You Discover A Problem

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Module 8 – What to Do if You Discover a Problem

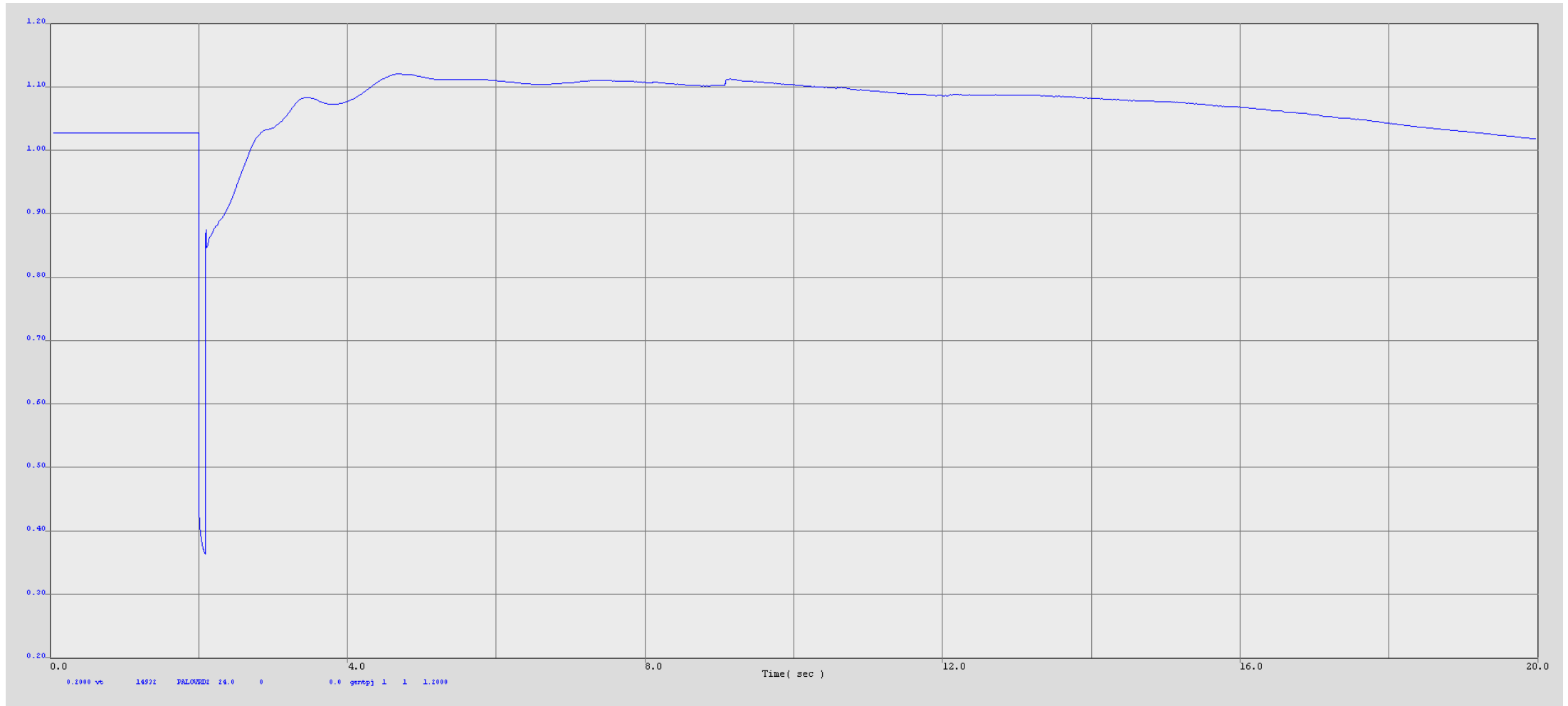
- Agenda
 - Necessity of dynamic reactive support to ensure reliable operation of the Bulk Power System
 - Overview of significant events related to voltage control
 - Review applicable VAR and MOD standards related to voltage control applicable to Category 2 GO/GOP
 - Ensuring compliance obligations are met
 - Compliance and risk checklists
 - Overview of what to do if a problem is discovered
 - GADS reporting

Operational Issues Associated with Proper AVR Control

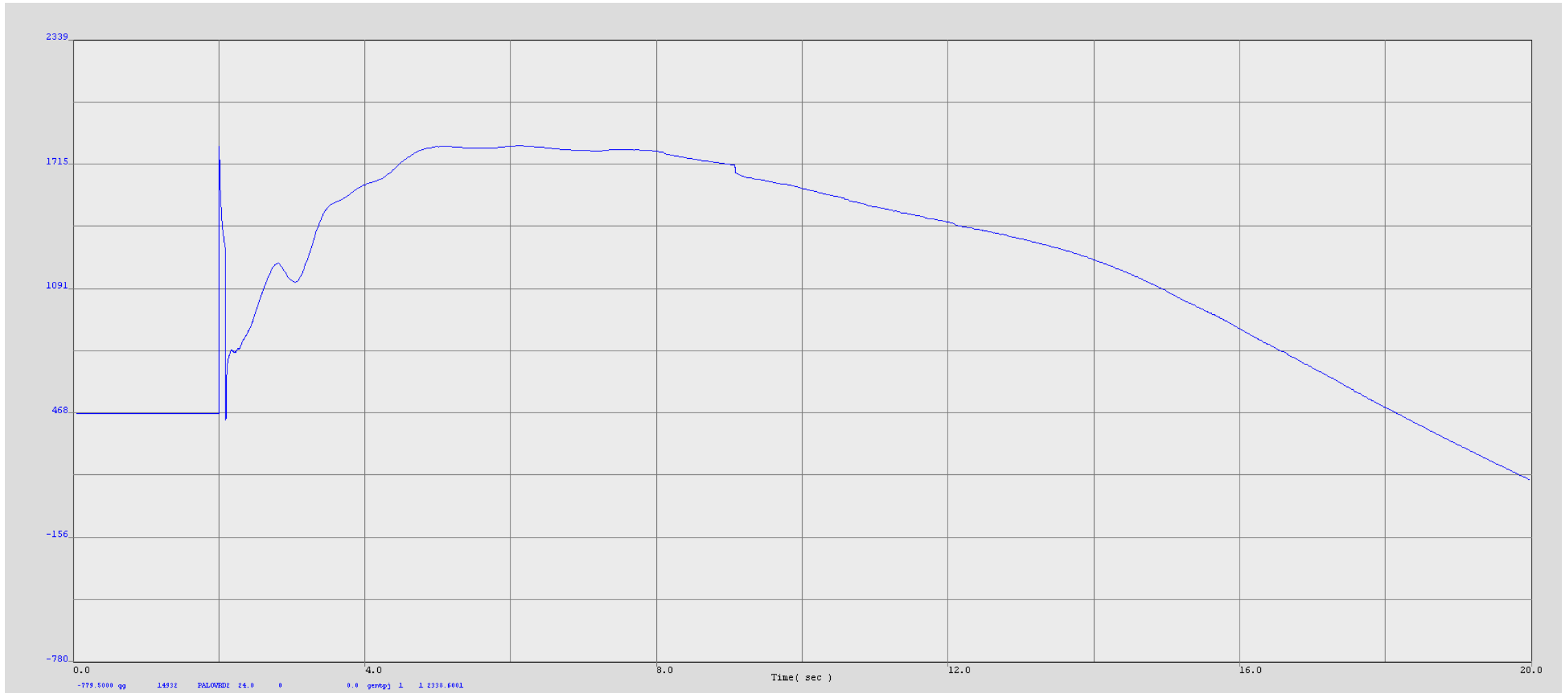
- Dynamic reactive support is essential for reliable operation during normal operation and “routine” events that occur nearly every day on the interconnection.
 - VARs “don’t travel well.” Voltage control is very dependent upon the location of the dynamic reactive resources.
 - As demand changes on the interconnection, voltage requirements are always changing: both up and down.
 - Removing and adding generators will change the dynamic reactive capability of the remaining generation fleet.
 - Faults on high voltage facilities dramatically increase the VAR demand on the system in the immediate vicinity of the faulted equipment.
 - Without dynamic reactive support, voltage performance during faulted conditions would not allow reliable operation.



Generator Voltage for Fault



Generator VAR Output for Fault





1996 WI Disturbances

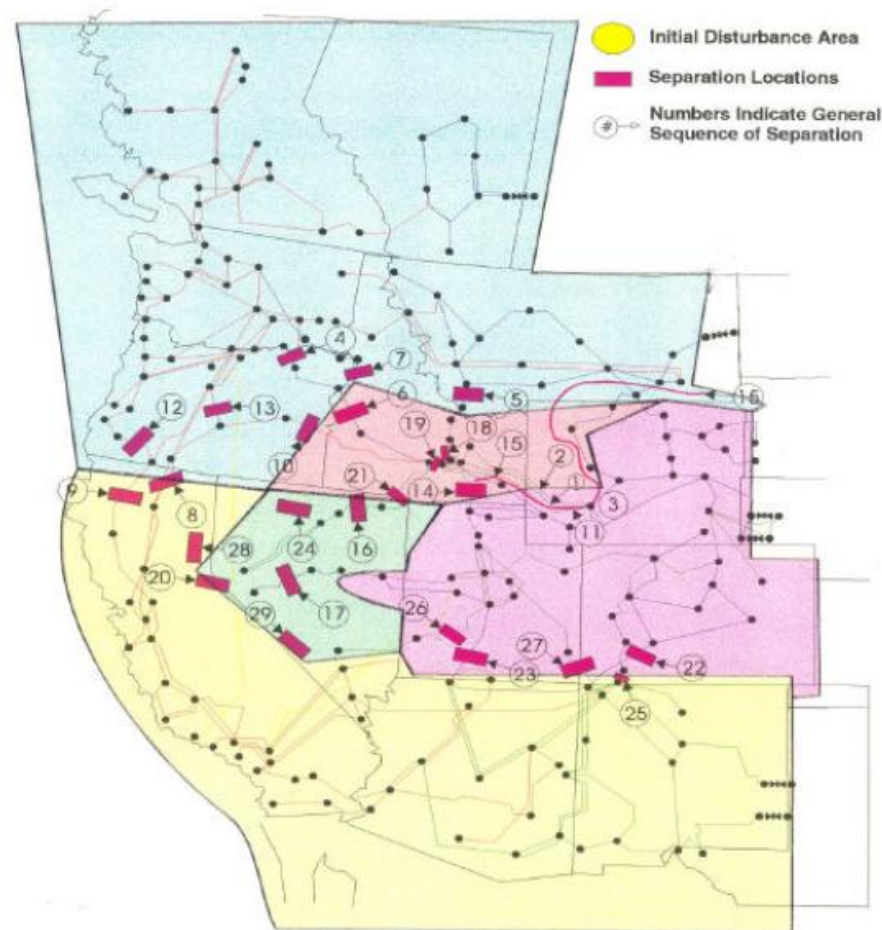
- July 2, 1996
 - July 3, 1996 — Near miss
- August 10, 1996

1996 July WSCC System-wide Disturbance

SEQUENCE OF SYSTEM SEPARATIONS			
FOR JULY 2, 1996, DISTURBANCE ON THE WESTERN INTERCONNECTION			
Sequence Number	Time	Unit/Line	Difference from Time 0
1	14:24:37.185	Kinport-Jim Bridger 345 kV line tripped for B-ph fault	00:00:00.000
2	14:24:37.200	Jim Bridger-Goshen 345IV line tripped	00:00:00.015
3	14:24:37.206	Jim Bridger units 2 & 4 tripped by remedial action scheme	00:00:00.021
4	14:24:38.995	LeGrande-Roundup 230 kV line tripped	00:00:01.810
5	14:25:01.052	Anaconda-Amps 230 kV line tripped	00:00:23.867
		Dillon-Big Grassy line tripped	
6	14:25:04.404	Boise Bench-Brownlee 230 kV line No 3 tripped	00:00:27.219
	14:25:04.521	Boise Bench-Brownlee 230 kV line No. 1 tripped	00:00:27.336
	14:25:05.053	Boise Bench-Brownlee 230 kV line No 2 tripped	00:00:27.868
	14:25:05.237	Boise Bench-Brownlee 230 kV line No. 4 tripped	00:00:28.052
7	14:25:05.504	Hells Canyon-Walla Walla 230 kV line trip	00:00:28.319
8	14:25:06.787	Malin-Round Mountain 500 kV line No. 2 tripped	00:00:29.602
	14:25:06.793	Malin-Round Mountain 500 kV line No. 1 tripped	00:00:29.608
9	14:25:06.880	Captain Jack-Olinda 500 kV line tripped	00:00:29.695
10	14:25:07.020	Midpoint-Summer Lake 500 kV line tripped	00:00:29.833
11	14:25:07.329	Borah-Bridger 345 kV line tripped	00:00:30.144
12	14:25:07.330	Captain Jack-Meridian 500 kV line tripped	00:00:30.145
13	14:25:07.344	Grizzly-Sumer Lake 500 kV line tripped	00:00:30.159
14	14:25:07.789	Borah-Ben Lomond 345 kV line tripped	00:00:30.604
15	14:25:07.792	Brady-Treasureton remedial action scheme takes effect	00:00:30.607
16	14:25:08.138	Coyote Creek-Valmy 345 kV line tripped	00:00:30.953
17	14:25:08.150	Ft Churchill-Austin 230 kV line tripped	00:00:30.965
18	14:25:08.156	Midpoint-Kinport 345 kV line tripped	00:00:30.971
19	14:25:08.230	Midpoint-Borah-Adelaide No. 2 345 kV line tripped	00:00:31.045
	14:25:08.279	Midpoint-Borah-Adelaide No. 1 345 kV line tripped	00:00:31.094
20	14:25:09.000	North Truckee-Summit line tripped	00:00:31.815
21	14:25:09.255	Midpoint-Humboldt 345 kV line tripped	00:00:32.070
22	14:25:10.837	Lost Canyon-Curecardi 230 kV line tripped	00:00:33.652
23	14:25:10.980	Sigurd-Glen Canyon 230 kV line tripped	00:00:33.795
24	14:25:11.005	Winnemucca 120 kV line tripped	00:00:33.820
25	14:25:11.101	Hesperus-Water 1-Tow 345 kV line tripped	00:00:33.916
26	14:25:11.230	Harry Allen-Red Butte 345 kV line tripped	00:00:34.045
27	14:25:11.300	Pinto-Four Corners 345 kV line tripped	00:00:34.115
28	14:25:13.000	California-Summit 120 kV line tripped	00:00:35.815
29	14:25:37.185	Silver Peak-Control line tripped	00:01:00.000

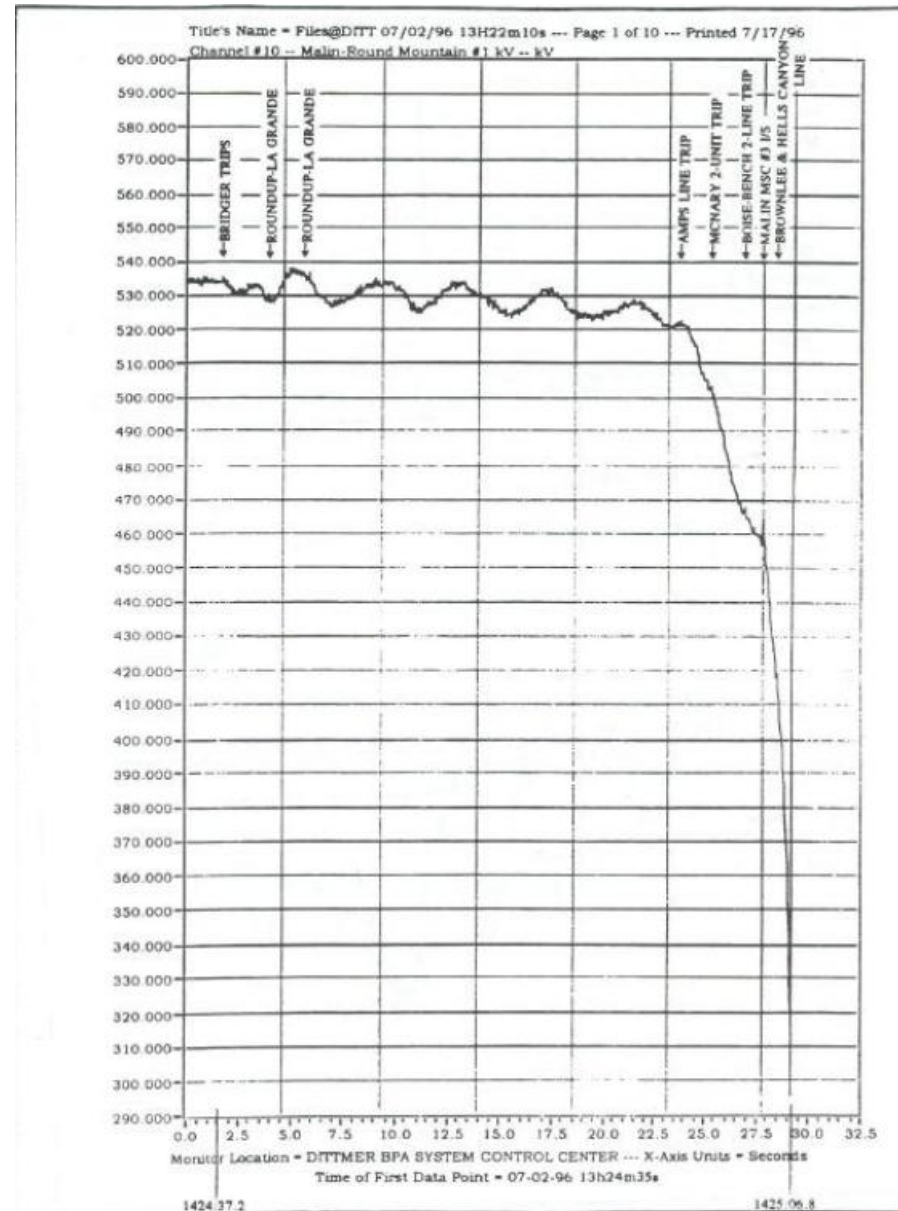
1996 July WSCC System-wide Disturbance

Sequence of System Separations



Islands Formed -- July 2, 1996

1996 July WSCC System-wide Disturbance



July 2, 1996

Results:

The Western Systems Coordinating Council (WSCC) system separated into five islands and in electric service interruptions to over two million customers. Electric service was restored to most customers within 30 minutes, except on the Idaho Power Company (IPC) system, a portion of the Public Service Company of Colorado (PSC), and the Platte River Power Authority (PRPA) systems in Colorado, where some customers were out of service for up to six hours. On portions of the Sierra Pacific Power Company (SPP) system in northern Nevada, service restoration required up to three hours.

July 2, 1996

Conclusions:

Insufficient voltage support in the Northwest and Idaho for the operating conditions of July 2 was a primary factor that contributed to the widespread impact of this disturbance. The initiating event, the near simultaneous outage of two 345 kV Jim Bridger lines, should not have resulted in the system separations and loss of demand experienced on July 2, 1996.

July 3, 1996

Contributing Actions:

As a precautionary measure to avoid possible unit shedding of critical generation, **the operators placed the voltage regulators in “manual” operation, and reduced the voltage set point.** Although this action did relieve stress on the generating units, it was undesirable from an interconnected system standpoint in that it reduced reactive support to the Boise area, which contributed to the need for manual load shedding to arrest declining voltage. This action induced a steady voltage decline to 205 kV over a three-minute period.

July 3, 1996

Extraordinary Actions:

The Idaho Power system dispatcher action at the control center shed 600 MW over the next two minutes to arrest voltage decline in Boise. Voltages immediately recovered to 230 kV upon the completion of the load shed.

It is not clear whether the IPC system operators would have had to resort to shedding firm demand had the Brownlee plant continued to contribute full reactive support.

July 2 and 3, 1996

- Voltage and VAR conclusions:
 - Insufficient voltage support based on system conditions
 - Manual operator action to place generator voltage regulators on “manual”
 - Generators tripping on over-excitation
 - Inadequate under-voltage load shedding programs

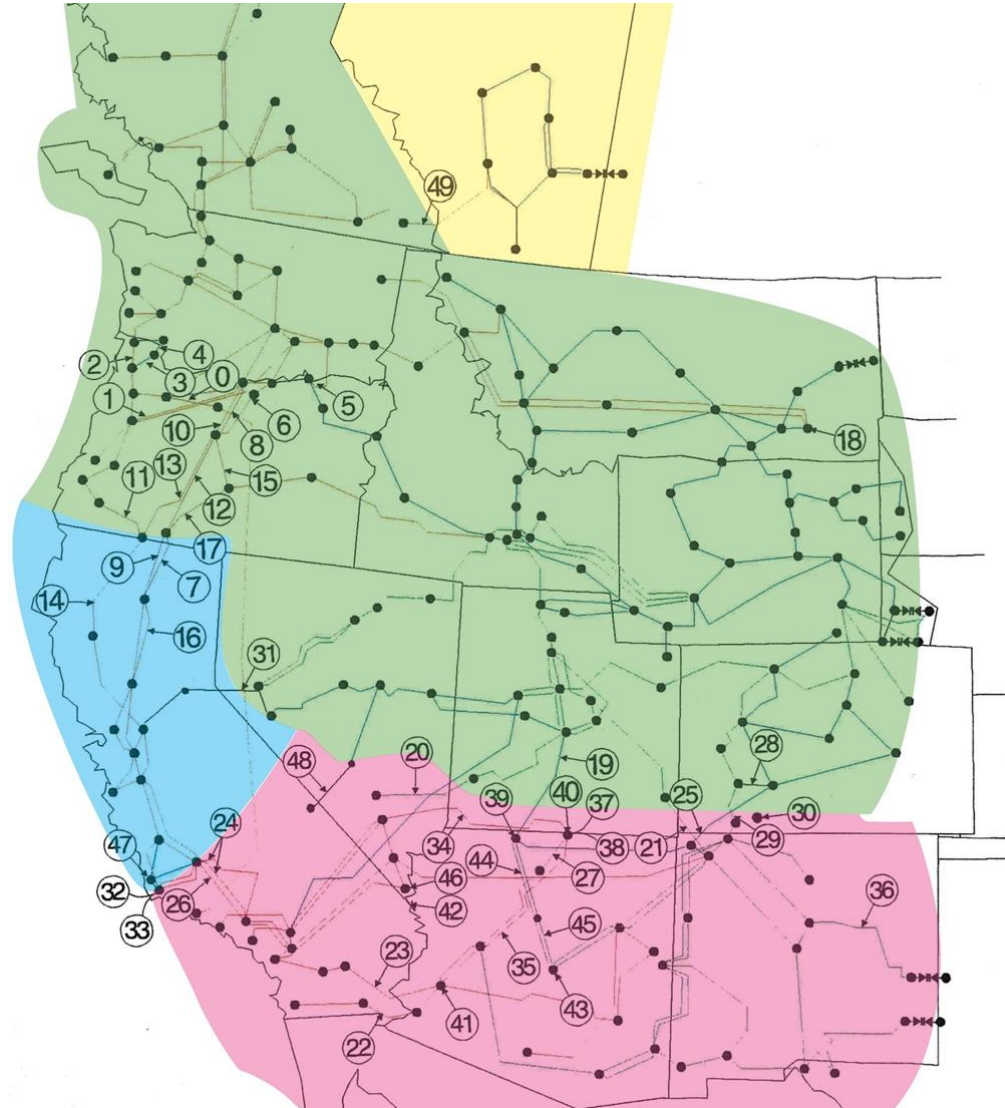
1996 August WSCC System-wide Disturbance

SEQUENCE OF SIGNIFICANT EVENTS — AUGUST 10, 1996			
EVENT NUMBER	TIME	Event	DIFFERENCE FROM Time=0
			HH:MM:SS.000
0	14:06:39.769	500 kV Big Eddy- Ostrander single phase-to-ground fault relay tripped three phases. Flashed to tree.	00:00:00.000
1	14:52:37.156	500 kV John Day-Marrion single phase-to-ground fault. Opened single pole failed to reclose.	00:45:57.347
2	15:42:03.139	500 kV Keeler-Allston single phase-to-ground fault: opened single pole with unsuccessful reclose, Flashed to tree.	01:35:23.370
3	15:47:29	115kV Merwin-St. Johns line opened due to relay misoperation (time is approximate.)	01:40:49.231
4	15:47:36	230 kV Fault on Ross-Lexington line. Faulted to tree, Fault started small fire.	01:40:56.231
		(BEGINNING OF DISTURBANCE)	
5	15:47:36	McNary trips 117 MW (2 unit.) - (Timing is for Event 4 for the rest of table)	00:00:00.000
	15:47:40		00:00:04.000
	15:47:44	McNary trips 215 MW (3 units)	00:00:08.000
	15:47:52	McNary trips 75 MW (1 unit)	00:00:16.000
	15:48:09	McNary trip (1 unit)	00:00:33.000
		McNary trip (1 unit)	
6	15:48:52.588	500 kV Buckley-Grizzly line open at Buckley	00:01:16.588
7	15:48:52.613	500 kV Malin-Round Mountain No. 2 line open at Malin	00:01:16.613
8	15:48:52.618	500 kV John Day-Grizzly No. 1 line open at John Day; Open at Grizzly at 52.633	00:01:16.618
9	15:48:52.632	500 kV Malin-Round Mountain No. 1 line open at Malin	00:01:16.632
10	15:48:52.611	500 kV John Day-Grizzly No. 2 line open at Grizzly; open at John Day at 57.654	00:01:16.641
11	15:48:52.682	500 kV Captain Jack-Meridian line open at Captain Jack power circuit breaker (PCB Nos. 4983, 4986), reclose blocked	00:01:16.682
12	15:48:52.740	500 kV Grizzly-Malin No 2 line open at Grizzly (PCB No. 4048) open at Malin at 52.750.	(XI:01:16.740
13	15:48:52.778	500 kV Captain Jack-Grizzly line opened at Captain Jack (PCB Nos 4993, 4990); Grizzly open at 57.794	00:01:16.778
14	15:48:52.782	500 kV Captain Jack Olinda line Open at Captain Jack (PCB Nos 4977, 4980) (COI NOW OPEN BETWEEN OREGON AND CALIFORNIA)	00:01:16.782
15	15:48:52.878	500 kV Grizzly-Summer Lake line Open at Grizzly: open at Summer Lake at 52.907	00:01:16.878
16	15:48:53.000	500 kV Round Mountain-Table Mountain No. 2 line open ended at Round Mountain	00:01:17.000
17	15:48:53.255	500 kV Malin-Summer Lake line opens at Summer Lake; Malin terminal opens at 53.258	00:01:17.255
18	15:48:53.622	Colstrip Unit Nos. 3 and 4 trip offline.	00:01:17.622
	15:48:53.689	Colstrip Unit 1 trips offline	00:01:17.649
19	15:48:53.708	Sigurd terminal of the 230 kV Glen Canyon-Sigurd line opened by out-of-step relay.	00:01:17.708
20	15:48:53.930	345 kV Red Butte-Harry Allen line opened by out-of-step relay	00:01:17.930
21	15:48:54.415	345 kV Four Corner-Pinto line Opens (*at Four Corners)	00:01:18.415
22	15:48:54.576	500 kV North Gila-Imperial Valley line opens	00:01:18.576
23	15:48:54.622	500 kV Palo Verde-Devers opens at Palo Verde: at Devers it opens at 54.625.	00:01:18.622
24	15:48:54.700	500 kV Midway-Vincent Nos 1 and 2 lines opened by out-of-step relay.	00:01:18.700
25	15:48:54.703	230 kV Shiprock-Lost Canyon line opened by out of step relay.	00:01:18.703
26	15:48:54.765	500 kV Midway-Vincent No. 3 line opens due to voltage collapse. (NORTHERN CALIFORNIA NOW SEPARATED FROM SOUTHERN CALIFORNIA)	00:01:18.765
27	15:48:54.825	500 kV Navajo-Moenkopi line opens at Navajo	00:01:18.825
28	15:48:54.846	Curecanti terminal of the 115 kV Curecanti line opens (Zone1)	00:01:18.846
29	15:48:54.936	Hesperus terminal of the 345 kV Waterflow-Hesperus line and both terminals of 345 kV Montrose-Hesperus line opened by out-of-step relays.	00:01:18.936
30	15:48:54.938	City of Farmington, NM, Glade Top-Durango 115 kV tie opened at Glade Tap by out-of-step relays (two paths now open).	00:01:18.938

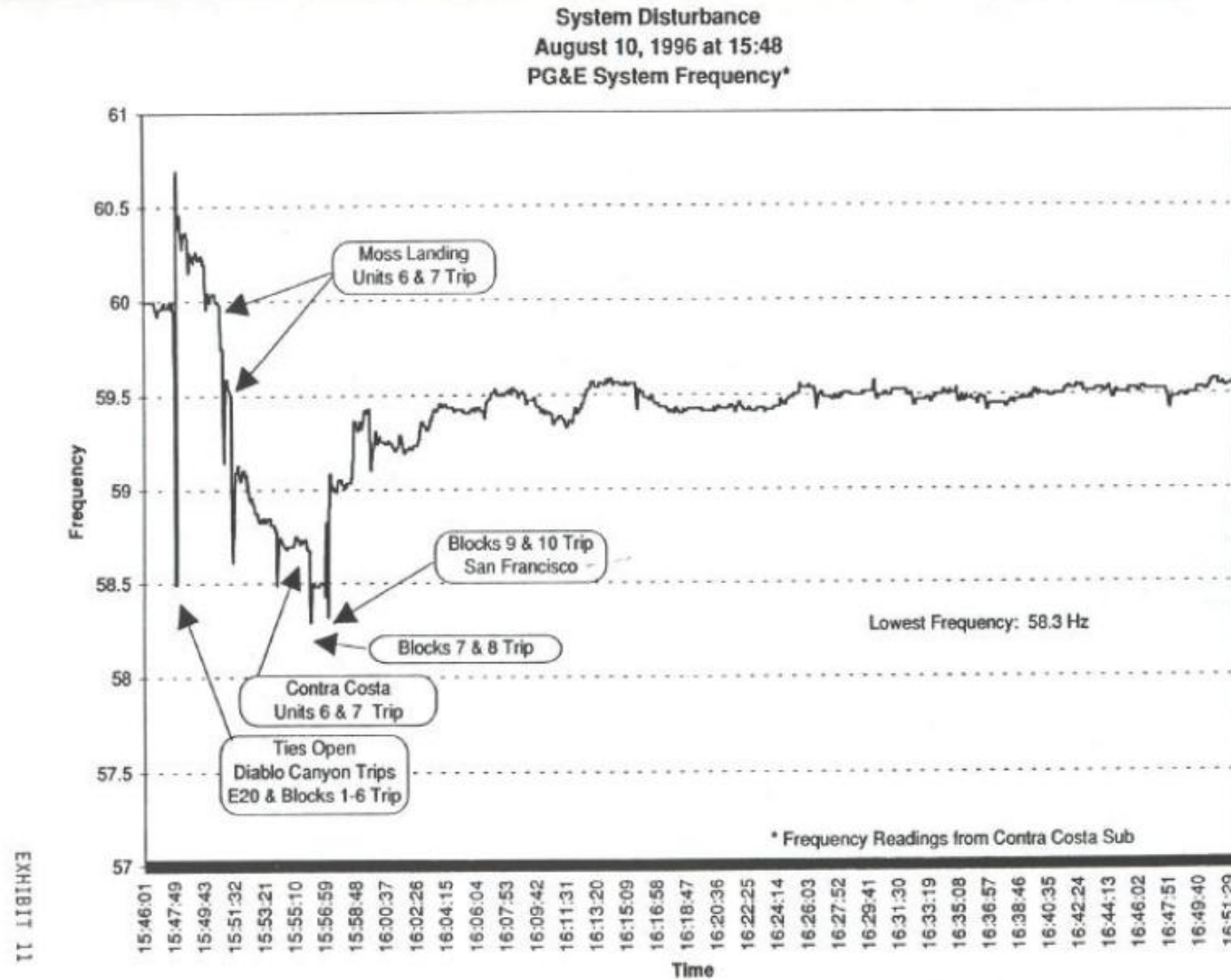
1996 August WSCC System-wide Disturbance

31	15:48:55.000	120 kV North Truckee-Summit line, 120 kV California-Summit Line and 60 kV Truckee-Tahoe Donner line open.	00: 01:19 000
32	15:48:55.141	Diablo Canyon Unit No. 2 trips offline	00:01:19.141
33	15:48:55.405	Diablo Canyon Unit No. 1 trips offline	00:01:19 405
34	15:18:58.496	500 kV Navajo- McCullough line opens at Navajo.	00:01:22 496
35	15:48:58 .803	500 kV Navajo Westwing line opens at Navajo.	00: 01:22.803
36	15:48:59.000	345 kV BB line and Blackwater DC Converter trip out of service.	00:01:23.000
37	15:48:59.341	Navajo Unit No. 1 trips offline .	00:01:23.341
38	15:48:59.497	Navajo Unit No. 2 trips offline.	00:01:23.492
39	15:49:00.000	Glen Canyon Unit Nos. 7, 5, 7, and 8 removed from service by a remedial action scheme while carrying about 430 MW. These trips were caused by the loss of both 345 kV Glen Canyon-Flagstaff Lines	00:01:24.000
40	15:49:07.140	Navajo Unit No. 3 trips offline	00:01:31.140
41	15:49:13.315	Palo Verde Unit No. 1 trips offline.	00:01:37.315
	15:49:13.405	Palo Verde Unit No. 3 trips offline.	00:01:37.405
42	15:49:14.000	Hoover Dam: Units 2, 3, and 8 trip offline	00:01:38 000
43	15:49:20.830	Pinnacle Peak-Pinnacle Peak (WAPA).	00:01:44.800
44	15:49:45.271	Glen Canyon terminals of the 345 k V Glen Canyon Flagstaff Nos. 1 and 2 lines open.	00:02:09.271
45	15:49:48.000	Pinnacle Peak: Flagstaff-Pinnacle Peak No. 1 Line PCBs Nos. 1092, 1196 opened. Flagstaff-Pinnacle Peak No. 2 Line PCB Nos. 1492, 1596 opened.	(XI: 02:12.000
46	15:49:59.723	Mohave Unit No. 2 trips offline.	00:02:23.723
47	15:50:00 IVX)	Hunters Point Unit No. 2 . and Morro Bay Unit Nos. 1-4 trip offline.	00:02:24.000
48	15:50:00 000	55 kV Silver Peak tie opens at Silver Peak.	00:02:24.000
49	15:54	500 kV Cranbrook-Lagdon lines open.	00:06:24.000
		(FINAL SYSTEM SEPARATION)	

1996 August WSCC System-wide Disturbance



1996 August WSCC System-wide Disturbance



August 10, 1996

Conclusion:

The system oscillations increased until voltage finally collapsed on the California–Oregon Intertie (COI), leading to the COI opening and the subsequent formation of four islands in WSCC. Generating units in the Northwest (such as Hermiston and Coyote Springs) did not respond dynamically or in the steady state with reactive support as predicted in studies. The level of dynamic reactive support from generation at the northern terminus of the COI and PDCI was greatly reduced by fish operation constraints, particularly at the Dalles.

All of which led to opening the COI and other major lines, and the formation of four islands, causing the widespread uncontrolled outage of generation and interrupting electric service to about 7.5 million customers. The opening of the COI (which also occurred on July 2) resulted in about 28,000 MW of underfrequency load shedding and about 20,000 MW of unanticipated generation removed from service in the northern California and southern islands in this disturbance.

August 10, 1996

Recommendation:

- Testing of reactive capabilities of all generators greater than 10 MW
 - Both steady-state and dynamic capabilities must be modeled.
- Proof of testing must be provided.

August 10, 1996

- Voltage and VAR conclusions:
 - Excitation protection removing generating units or running back reactive production within limits
 - Generators operated in constant power factor control vs. (automatic) voltage control mode.
 - Generators did not respond dynamically or in steady-state with reactive support, as predicted in studies.
 - Growing system oscillations resulted in increasing voltage and power swings on the COI, leading to COI instability and separations. The growing oscillations may be attributed to an increased electrical angle between northwest generation and the COI due to:
 - Reduced reactive support to the COI resulting in removal from service of the McNary units and nonparticipation of Coyote Springs, and Hermiston, **which were operating on constant power factor control rather than voltage control.**

Voltage Setpoint and Control Loops

- VAR-001-5
 - Applicability — Generator Operators within the Western Interconnection (for the WECC Variance)
 - Purpose — To ensure that voltage levels, reactive flows, and reactive resources are monitored, controlled, and maintained within limits in real time to protect equipment and the reliable operation of the interconnection.
- E.A.15 - Each Generator Operator shall provide its voltage set point conversion methodology from the point in Requirement E.A.14 to the generator terminals within 30 calendar days of request by its Transmission Operator.
- E.A. 17- Each Generator Operator shall meet the following control loop specifications if the Generator Operator uses control loops external to the automatic voltage regulators (AVR) to manage Mvar loading:
 - E.A.17.1 Each control loop's design incorporates the AVR's automatic voltage-controlled response to voltage deviations during System Disturbances.
 - E.A.17.2. Each control loop is only used by mutual agreement between the Generator Operator and the Transmission Operator affected by the control loop.

Operating in Automatic Voltage Control

- VAR-002-4.1
 - Applicability — Generator Operators and Owners
- Purpose — To ensure generators provide reactive support and voltage control, within generating Facility capabilities, to protect equipment and maintain reliable operation of the interconnection.
- R1. The Generator Operator shall operate each generator connected to the interconnected transmission system in the automatic voltage control mode ...

Maintain Voltage or Reactive Power Schedule

- VAR-002-4.1
 - Applicability — Generator Operators and Owners
- Purpose — To ensure generators provide reactive support and voltage control, within generating Facility capabilities, to protect equipment and maintain reliable operation of the interconnection.
- R2. Unless exempted by the Transmission Operator, each Generator Operator shall maintain the generator voltage or Reactive Power schedule ...

Notifications of Status Change

- VAR-002-4.1
 - Applicability — Generator Operators and Owners
- Purpose — To ensure generators provide reactive support and voltage control, within generating Facility capabilities, to protect equipment and maintain reliable operation of the interconnection.
- R3. Each Generator Operator shall notify its associated Transmission Operator of a status change on the AVR, power system stabilizer, or alternative voltage controlling device within 30 minutes of the change ...

Reactive Capability Changes

- VAR-002-4.1
 - Applicability — Generator Operators and Owners
- Purpose — To ensure generators provide reactive support and voltage control, within generating Facility capabilities, to protect equipment and maintain reliable operation of the interconnection.
- R4. Each Generator Operator shall notify its associated Transmission Operator within 30 minutes of becoming aware of a change in reactive capability due to factors other than a status change ...

Step-up and Auxiliary Transformer Settings

- VAR-002-4.1
 - Applicability — Generator Operators and Owners
- Purpose — To ensure generators provide reactive support and voltage control, within generating Facility capabilities, to protect equipment and maintain reliable operation of the interconnection.
- R5. The Generator Owner shall provide the following to its associated Transmission Operator and Transmission Planner within 30 calendar days of a request ...
 - 5.1. For generator step-up and auxiliary transformers with primary voltages equal to or greater than the generator terminal voltage:
 - 5.1.1. Tap settings.
 - 5.1.2. Available fixed tap ranges.
 - 5.1.3. Impedance data

Transformer Tap Changes

- VAR-002-4.1
 - Applicability — Generator Operators and Owners
- Purpose — To ensure generators provide reactive support and voltage control, within generating Facility capabilities, to protect equipment and maintain reliable operation of the interconnection.
- R6. After consultation with the Transmission Operator regarding necessary step-up transformer tap changes, the Generator Owner shall ensure that transformer tap positions are changed ...

Providing Data to the Transmission Planner or Planning Coordinator

- MOD-032-1
 - Applicability — Generator Owner
 - Purpose — To establish consistent modeling data requirements and reporting procedures for development of planning horizon cases necessary to support analysis of the reliability of the interconnected transmission system.
- R2. Each ...Generator Owner, ... shall provide steady-state, dynamics, and short-circuit modeling data to its Transmission Planner(s) and Planning Coordinator(s) according to the data requirements ...

Updated Data or Explanation of Technical Basis

- MOD-032-1
 - Applicability — Generator Owner
 - Purpose — To establish consistent modeling data requirements and reporting procedures for development of planning horizon cases necessary to support analysis of the reliability of the interconnected transmission system.
- R3. Upon receipt of written notification ... each notified ... Generator Owner, ... shall respond to the notifying Planning Coordinator or Transmission Planner as follows ...
 - 3.1. Provide either updated data or an explanation with a technical basis for maintaining the current data;
 - 3.2. Provide the response within 90 calendar days of receipt, unless a longer period is agreed upon by the notifying Planning Coordinator or Transmission Planner.

Ensure Compliance Obligations are Being Met



Registration and
Asset Identification

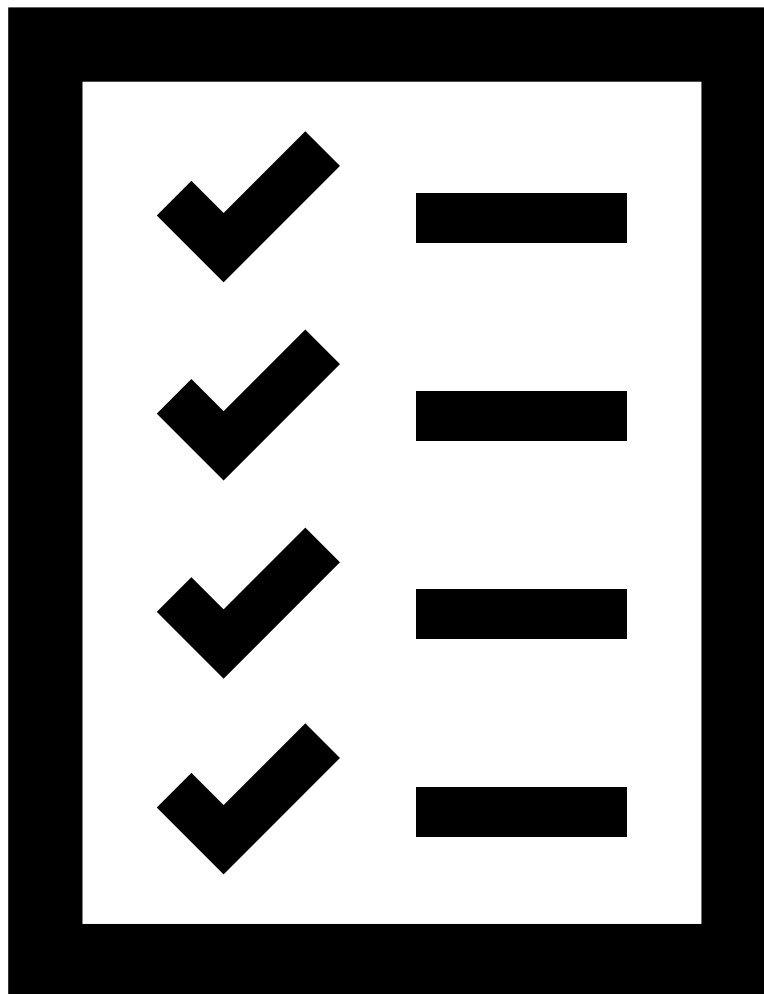


NERC O&P
Compliance



Audit Readiness and
Governance

Compliance and Risk Checklist



Compliance and Risk Checklist – Ensure SME Has Reported Event

Communications – internal and external

- Cross-functional, executive leadership
- Regional Entity (RE), neighboring entities and NERC

EOP-004 Awareness

- Applicability and timeliness

Event Analysis Awareness

- Available reports



Compliance and Risk Checklist – Create a Project

Governance
Risk and
Compliance
(GRC) Tool

Define scope and assignments

Timeline and milestones

SME, Risk and Compliance meetings

Internal and external
communications management

Documentation retention

Compliance and Risk Checklist – Root Cause Analysis

Reliability Guidance Documents

- NERC developed documents

GADS

- Failure history
- Event scope
- Periodical reporting required

Lessons Learned

- NERC posted
- Internal lessons

Controls Guidance and Failure Points

- Available on WECC website

Compliance and Risk Checklist – Document Event and Mitigation



Review Internal Controls

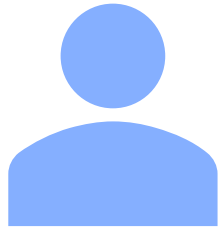


Retain Evidence and
Documentation



Complete Investigation
And Report (If Applicable)

Compliance and Risk Checklist – Communications, Collaboration, and Resources



Internal and external

Operational sync
Executive leadership
Neighboring entities



Industry forums and peer groups

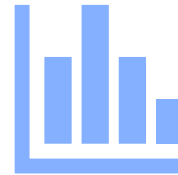
Western Interconnection Compliance Forum (WICF)
North American Generator Forum (NAGF)
North American Transmission Forum (NATF)
NERC Probabilistic Analysis Forum (PAF)

Compliance and Risk Checklist – Report out



Lessons learned

Internally and/or externally



Event Analysis reports

ERO Event Analysis Process
Guidelines



Process/procedure updates

Updates to specific operational or
technical procedures
Revision of internal controls
Compliance oversight framework
Training and qualifications
Optimizing response and reporting
Evidence collection

Compliance and Risk Checklist – Follow Up



Audit Ready

Milestone tracking
Effectiveness review
Closure



Training and Certification

Update or overhaul training
Automate certification reviews
Workshops and industry resources

What to Do if You Discover a Problem

Event stabilization

- Halt impact
- Secure the grid
- Stop operational failure
- Eliminate threat to BES
- Preserve evidence

Issue identification

- Determine asset applicability
- Cross-reference applicable standards and requirements
- Determine issue category
- Documentation and evidence deficiencies

Root cause analysis

- Identify scope and exactly what happened
- Determine duration
- Extent of condition
- Document narrative
- Communicate appropriately

Extent of condition

- Scope of assets and documents
- Scope of applicable standards and requirements
- Times and longevity

What to Do if You Discover a Problem

Reliability impact evaluation

- Update documentation
- Hold meetings with internal and external stakeholders
- Review internal controls

Reporting decisions

- Determine reporting obligation
- Draft milestones
- Update internal controls
- Track milestones

Mitigation planning

- Corrective action plan
- Preventative actions
- Milestone tracking
- Evidence gathering
- Verification review
- Internal controls review

Transparency and professional expectations

- Early communication and collaboration
- Keep stakeholders informed

Standards Immediately Applicable to Category 2 Facilities

Reliability Standard	Standards Project # For Inclusion of Cat 2	Status	Effective Date of Standard	Category 2 IBR Compliance Date
BAL-001-TRE	Project 2024-01	Approved	7/1/2020	5/15/2026
IRO-010-5	Project 2024-01	Approved	7/1/2025	5/15/2026
MOD-026-2	Project 2020-06	Approved	4/1/2026	
MOD-032-2	Project 2024-01	Approved	7/1/2015	5/15/2026
MOD-033-3	Project 2021-01	Approved	4/1/2026	
PRC-012-2	Project 2024-01	Approved	1/1/2021	5/15/2026
PRC-017-1	Project 2024-01	Approved	4/1/2017	5/15/2026
PRC-028-1	Project 2021-04	Approved	4/1/2025	
PRC-029-1	Project 2020-02	Approved	10/1/2026	
PRC-030-1	Project 2023-02	Approved	10/1/2026	
TOP-003-6.1	Project 2024-01	Approved	7/1/2025	5/15/2026
VAR-001-5	Project 2024-01	Approved	1/1/2019	5/15/2026
VAR-002-4.1	Project 2024-01	Approved	9/26/2017	5/15/2026

[Reliability Standards Compliance Dates for Generator Owners & Generator Operators](#)

NERC GADS

Purpose

- GADS was created to provide **critical data for grid reliability**.
 - **Conventional Generating Units:** 20 MW or larger
 - **Wind Plants:** Owned by NERC-registered Generator Owners with 75 MW or more capacity and commercial operation after January 1, 2005
 - **Solar Plants:** Owned by NERC-registered Generator Owners with 20 MW or more capacity

NERC GADS

Data and Analysis

- GADS collects standardized data on:
 - Unit availability and performance
 - Outages and deratings
 - Equipment reliability and maintainability metrics

This information is used to **analyze trends, improve operational planning, and support regulatory compliance.**

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