Final Notes
February 10, 2016

OPERATING COMMITTEE
October 7, 2015 – 1:00 – 5:00 PM
NWPP Offices – 7505 N.E. Ambassador Place, Suite R – Portland, Oregon
Portland/Vancouver Room

The meeting agenda and attendance list are attached as Attachments #1 and #2, respectively.

1. Introductions, Arrangements, and Agenda Changes Greg Travis (IPCO), Chair

Don Badley provided a PowerPoint of the conference facilities and meeting arrangements.

2. Accept Meeting Notes – June 3, 2015 Don Badley, NWPP

Notes of the June 3, 2015 NWPP Operating Committee meeting were accepted, without modification, by unanimous consent.

3. Action Items from April 1, 2015 Meeting – Status Review Don Badley, NWPP

- Don Badley will solicit each OC member to provide their top 5 suggestions for what they would like to have the OC focus on. *Completed via Greg Travis survey – Agenda Item 5.*
- Staff will poll utilities to find out which ones have a bridge or dedicated lines that could be used to connect parties to a common call. *Completed – Agenda Item 11.*
- The OC decided to remove the OUO policy from the NWPP Transmission System Maps. *Complete.*
- Raj Hundal volunteered to serve on the NWPP Agreement task force in place of Pawel Krupa. *Complete.*
- A listing of decisions made by the OC will be posted on the OC portal of the NWPP website and kept up to date. The listing begins with the October 2013 OC meeting. *Complete.*

4. Transmission Planning Committee (TPC) – Update Joe Wilson (TPWR), Chair

Joe Wilson reported that the TPC proposes formation of a small group of operations engineers and transmission engineers to facilitate identification of gaps that exist between the operations and planning horizons and how they might be coordinated. The desired end result would be information flow between the two disciplines to fill the gaps and, then, to have a unified voice when dealing with Peak Reliability.

Joe Wilson will lead the work group. Other members of the group are: Don Johnson (PGE), Larry Frick (PAC), Tracy Rolstad (AVA), Joe Wilson (TPWR), Jared Ellsworth (IPC), and Bill Ruthruff (PAC). Eddie Elizeh volunteered someone from BPAT.

Jerry Rust commented that NERC is wrestling with the concept of using planning coordinators to cover transmission operation functions; this will involve Transmission Operators and, maybe, Transmission Owners.

Joe Wilson commented on a change Peak Reliability may implement in which System Operating Limits on paths could be determined in real-time by real-time tools.

5. OC Scope and Purpose All

Greg Travis distributed an appeal requesting each OC member to identify what the focus of the NWPP OC meetings should be. Six OC members responded; refer to Attachment #3. At the June OC meeting it was decided that this meeting's agenda would be dedicated to defining the OC.

Greg Travis began by saying he believes the OC could be more active as a regional voice to NERC, WECC or the RC on issues that will impact utilities within the NWPP footprint. It is his opinion that the OC provides a forum for communication and coordination with many of the entities (Transmission Operators, Market, Generator Operators, Reliability Coordinators, etc.) operating in the Northwest; if the OC ceases to meet he believes we will have missed an opportunity.

Jerry Rust identified many of the issues being deliberated on within NERC today, pointing out possible items of concern. Jerry emphasized that he will only give a black and white analysis and stay away from his personal opinions. Some of the members commented that it was a lot easier to discuss issues in the OC forum than in larger forums that are less intimate.

The following suggestions were made for future agendas.

- Current/proposed Standards out for comment/balloting.
- Frequency response monitoring tool being developed by Pacific Northwest National Laboratory.
- Guest speakers to discuss current items of intense interest.
- Power system control, transmission, or generation operating issues.

After reviewing the responses and a lengthy discussion, the OC agreed it is at the discretion of the Chair to determine if there are enough meaningful agenda items to hold a meeting. And, the decision needs to be made at least 4 weeks prior to the meeting date.

Action Item:
The following motion was made by Greg Travis and seconded by JJ Jamison.

> Recommendation: A proposed agenda will be sent out 30 days prior to the OC meeting with the OC Chair's recommendation to either hold the meeting or cancel the meeting. Members in disagreement can voice their concern to the Chair.

The NWPP corporate staff will confer with the Chair to keep the OC informed as to holding or cancelling the meeting.

Regarding the next OC meeting, since it is slated to be a joint meeting with the TPC, will be held as currently scheduled – i.e., February 10, 2016.

6. NERC Standard COM-001-2 Communications Greg Park, CHPD

a. Implementation – October 1, 2015
b. Designating Alternate Interpersonal communications is cumbersome – can (should) the NWPP aid in facilitating?
c. What is the best way to perform the required testing?

Greg Park discussed implementation of NERC Standard COM-001-2 and the complexity of meeting some of the requirements, especially Requirements R3 and R5. These require balancing authorities (BAs) and transmission operators (TOPs) to have Interpersonal Communication capabilities with adjacent BAs, adjacent TOPs, distribution providers, generator operators, and the reliability coordinator on a monthly basis. Where Interpersonal Communication is defined as any medium that allows two or more individuals to interact, consult, or exchange information.

Greg added that while the standard seems straight forward it will be very time consuming to implement. So, the question posed by Greg was can the NWPP OC devise a method of sharing data in a centralized way that could reduce time to communicate and document the activity that will satisfy compliance.

Jerry Rust commented that the NWPP already has a secured website with a communication capability designed to allow NWPP OC members to exchange information. However, protocols would have to be created about when and how to communicate. It would have to have information regarding updates, posting personnel, etc.

Action Item:
A working group will explore development of protocols for Interpersonal Communications through the secured portion of the NWPP website. Greg Park will chair the group. Other members of the group are: JJ Jamison, Chad Edinger, Denise Lietz and Don Badley (to facilitate). Jay Campbell volunteered to check to see if someone from NEVP would serve on the group as well.

Jerry Rust suggested that once the group decides on the path it wants to take, that it meet with Mike Moon (WECC Compliance) to discuss the manner in which they intend to satisfy the requirements of COM-002-2 and serve reliability.

7. NWPP Restoration Training Greg Park, CHPD

a. Peak RC coordinates with TOPs in California (CETAC), desert SW (DSTAC), and Rocky Mtn – Should the NWPP entities do the same?
b. Should the NWPP OC lead an effort to provide similar coordination as other regional entities?

Greg Park described his experience with the coordinated black start restoration training conducted in the Desert-Southwest with Peak Reliability – commenting that similar training is conducted in the California area and another in the Rocky Mountain area. However, since no such training exists in the NWPP area, Greg suggested that perhaps some thought should be given to restoration training in this area.

Jerry Rust explained the NWPP had a process prior to the development of a standard assigning restoration to the Reliability Coordinator function. Tony Burt stated that Peak has a restoration plan for every BA and stated that Peak would like to conduct one comprehensive exercise but realizes the impracticalities with trying to do an area-wide exercise for the NWPP members. Tony commented that Peak would be willing to get together with the NWPP members to develop a program(s) similar to other areas in WECC to enhance the learning gained by attendees.

Action Item:
Greg Park recommended that the NWPP OC pursue a regional program or philosophy for restoration training with Peak. Don Badley will request David Pennington to have coordinated system restoration training as one of the topics for discussion at the NWPP Training Coordinators meeting on November 17th. Tony will check with Peak to see if there are materials on the process Peak uses for restoration training. Tony committed Peak will attend the meeting on November 17.

A report on the coordinated restoration training discussion, at the NWPP Training Coordinators meeting, will be given at the February 10th OC meeting. The report will include actions for furthering this training.

8. Peak Reliability RC – Update — Tony Burt, Peak Reliability

Tony Burt provided a PowerPoint presentation; refer to Attachment #4. Following Tony's presentation a discussion ensued regarding recent and ongoing data requests from Peak and the burden they impose on the providers. Tony assured that Peak is aware these requests have a cost associated with them and, therefore, they carefully consider every request.

9. NERC – Update

a. Reliability Standards
b. Essential Reliability Services — Rich Hydzik, AVA

Rich Hydzik provided a PowerPoint document; refer to Attachment #5. Time did not permit for its presentation.

c. Event Analysis — Rich Hydzik, AVA

Rich Hydzik provided a PowerPoint document; refer to Attachment #6. Time did not permit for its presentation.

10. WECC – Update

a. Retirement of BAL-002-WECC-2 Spinning Requirement — Badley

Don Badley commented on the WECC effort to eliminate Requirement R2 (Spinning Reserve) from BAL-002-WECC-2. The drafting team met for the first time on October 1 and will be posting a solicitation for comment regarding their request to retire Requirement R2 in the near future.

11. NWPP Emergency Energy Plan (EEP) Simulation – Conferencing Line — Badley

Due to telephone conferencing facilities interruptions experienced during the EEP simulation being conducted from Spokane, a search for a more reliable conferencing system was made. Unfortunately, it did not produce any results.

12. Current Operations — All

No announcements or comments were made.

13. OC Goals for 2015-2016 Operating Year – Review — Travis

Time did not permit this item to be reviewed.

14. Review of Action Items Decided at this Meeting Badley

- Joe Wilson will lead a small group of operations engineers and transmission engineers to facilitate identification of gaps that exist between the operations and planning horizons and how they might be coordinated.
- Greg Park will lead a working group to explore development of protocols for Interpersonal Communications through secured portion of the NWPP website.
- Beginning in April 2016, 30 days prior to an OC meeting a proposed agenda will be distributed with the OC Chair's recommendation to either hold the scheduled meeting or cancel the meeting. Members in disagreement can voice their concern to the Chair.
- The NWPP OC will pursue a regional program or philosophy for restoration training with Peak Reliability. Also, a coordinated system restoration training item will be added to the agenda for discussion at the NWPP Training Coordinators meeting on November 17th.
-

15. Future Meetings

a. OC Meeting Dates for 2016
   - February 10 – Portland, OR
   - May 11 – Portland, OR (Goal Planning)
   - August 10 – Portland, OR
   - October 13 – Portland, OR

ADJOURN

ATTACHMENTS

NWPP OPERATING COMMITTEE MEETING

October 7, 2015

Preliminary Agenda
October 6, 2015

OPERATING COMMITTEE
October 7, 2015 – 1:00 – 5:00 PM
NWPP Offices – 7505 N.E. Ambassador Place, Suite R – Portland, Oregon
Portland/Vancouver Room

✓ *Action Item*

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✓ 2. **Accept Meeting Notes – June 3, 2015** — Don Badley, NWPP

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- A listing of decisions made by the OC will be posted on the OC portal of the NWPP website and kept up to date. The listing begins with the October 2013 OC meeting. *Complete.*

4. **Transmission Planning Committee – Update** — Joe Wilson (TPWR), Chair

5. **OC Scope and Purpose** — All

6. **NERC Standard COM-001-2 Communications** — Greg Park, CHPD

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b. Designating Alternate Interpersonal communications is cumbersome – can (should) the NWPP aid in facilitating?
c. What is the best way to perform the required testing?

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a. Peak RC coordinates with TOPs in California (CETAC), desert SW (DSTAC), and Rocky Mtn – Should the NWPP entities do the same?
b. Should the NWPP OC lead an effort to provide similar coordination as other regional entities?

8. **Peak Reliability RC** – Update — Tony Burt, Peak Reliability

NORTHWEST PowerPool

Preliminary Agenda
October 6, 2015

✓ *Action Item*

9. NERC – Update

a. Reliability Standards — Rust
b. Essential Reliability Services — Rich Hydzik, AVA
c. Event Analysis — Hydzik

10. WECC – Update

a. Retirement of BAL-002-WECC-2 Spinning Requirement — Badley

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- August 10 – Portland, OR
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ADJOURN

NWPP Operating Committee Meeting
October 7, 2015

Name	Organization	Email
In Person		
Darren Wilkie	Alberta Electric System Operator	darren.wilkie@aeso.ca
Rich Hydzik	Avista	rich.hydzik@avistacorp.com
Mark Willis	Balancing Authority of Northern California	mark.willis@smud.org
Edison Elizeh	Bonneville Power Administration	egelizeh@bpa.gov
Greg Park	Chelan County PUD	greg.park@chelanpud.org
Jeff Heminger	Douglas County PUD	jheminger@dcpud.org
Jesus Lopez	Grant County PUD	jlopez@gcpud.org
JJ Jamieson	Gridforce Energy Management	jj@grid4ce.net
Greg Travis	Idaho Power Company	gtravis@idahopower.com
Jamie Lynn Bussin	NaturEner	jbussin@naturener.us
Jay Campbell	NV Energy	jcampbell@nvenergy.com
Kathryn Downey	PacifiCorp	kathryn.downey@pacificorp.com
Tony Burt	Peak Reliability	tburt@peakrc.com
Bob Frost	Portland General Electric	robert.frost@pgn.com
Thomas Bagnell	Puget Sound Energy	thomas.bagnell@pse.com
Denise Lietz	Seattle City Light	denise.lietz@seattle.gov
Diane Brignone	Tacoma Power	dbrignone@tacoma.wa.us
Joe Wilson	Tacoma Power	wilsonj@cityoftacoma.org
Chad Edinger	Tacoma Power	cedinger@ci.tacoma.wa.us
Lloyd Linke	Western Area Power Administration - Upper Great Plains	lloyd@wapa.gov
Via Teleconference		
Raj Hundal	PowerEx	Raj.hundal@powerex.com
Staff		
Jerry Rust	NWPP Corporation	Jerry@nwpp.org
ChaRee DiFabio	NWPP Corporation	ChaRee@nwpp.org
Harlan Tallman	NWPP Corporation	harlan@nwpp.org
Don Badley	NWPP Corporation	don@nwpp.org

Comments on OC Re-Evaluation

The NWPP OC has been evolving and needs to reevaluate its purpose or mission in order to gain a better understanding of its service. Prior to the formation of the RSG Committee the OC focus was mainly on issues associated with reserve sharing which gave the OC a reason to meet but since the stand alone RSG Committee was established, the OC agendas have been less meaningful. At the last OC meeting it was decided that the next agenda would be dedicated to defining the OC. Each representative was asked to return to their respective organizations, discuss their desires for the future of the OC and submit a prioritized list of items they think is appropriate for the OC. Here is a listing of what we received, to date.

Respondent #1: Below is a list of items we think should be considered in the future of the OC:

- Has the usefulness and necessity of the OC been eclipsed by the establishment of the RSG Committee? Could the role of the RSG be consolidated with the OC to have a single committee? This may help to streamline processes and produce a greater opportunity for meaningful meeting agendas. We think these questions deserve honest discussion and consideration.
- While the OC can be a useful venue to identify shared problems and inefficiencies and to collaborate on solutions, particularly as the west continues its evolution to more efficient and organized market and reliability structures, the makeup of the committee participants has the propensity to be a forum for advancing competing business interests that can be controversial and even harmful. Consideration should be given to roles we are allowed to play and levels of participation in light of the mingling of market participants and reliability entities on the committees, sub-committees, and work-groups.
- Is the mission of the OC to enforce and maintain the status quo, or is it a forum for creative thinking and collaborative solution to address reliability and market challenges for the benefit of all? Perhaps the agendas seem less meaningful because of "committee fatigue". Lengthy processes to explore sensitive issues such as the use of reserves for loss of wind, ITRI, and other topics, have most generally resulted in disagreement. This occurs after interested parties express strong views which support individual business interests. It can seem as though we all arrive at the OC meetings and each put in a different color and the outcome is most often gray.

Respondent #2: I believe the OC could be more active as a regional voice on issues that will impact us with NERC, WECC or the RC. It is my opinion that the OC provides a forum for communication and coordination with many of the entities (Transmission Operators, Market, Generator Operators, Reliability Coordinators, etc.) operating in the Northwest; if the OC ceases to meet we will have missed an opportunity.

Respondent #3: I'd like to see the NWPP OC become more focused on the operations and planning reliability standards. Considering the NWPP staff is involved in the drafting of many of the reliability standards, it may be helpful to operations folks to hear more about pending and enforceable ones and have a group discussion. I know Jerry already provides an overview, but perhaps a more in depth review including RSAW documentation and so forth. It would be good to learn how others are demonstrating compliance.

Respondent #4: In my opinion, with the formation of the RSG Committee, in combination with the NERC Reliability Standards, the Peak RC, and other avenues such as WECC and the NATF, I do not see a clear deliverable of the OC. If there are specific items that can be identified with a deliverable, then I can see a justification for having a meeting.

Respondent #5: So many issues the OC was involved with and provided guidance for are now covered by the NERC standards. MORC is gone and outage coordination is driven by the PEAK RC. I'm not sure why but some of the issues that are being discussed and addressed are now handled by the MC. If there is

a good reason for this, you would know it better than me. I don't entirely disagree with Mr. Badley's comment, "if the OC ceases to meet we will have missed an opportunity." Perhaps a changed to the schedule of meetings, meet less or as needed, and or better identifying the purpose of the OC in today's world. In the past the OC drove many issues, there just aren't that many issues left that are being dealt with by the OC, the RC is covering much of them. Is there an opportunity for the OC to get more involved with the RC pertaining to operating issues? Just throwing stuff out… Again, the standards are driving most of the operational stuff, the only issues left with any flexibility is the market side of the business. As you can see I am having a hard time justifying the OC maintaining the status quoi as it is today. If the OC committee cannot find a useful role then change the OC committee meetings frequency and perhaps the focus.

Respondent #6: I would like to start out that I am new to attending the Operating Committee but what I see is the OC big plus is it is a forum that combines the marketing and reliability individuals in the same room. There are lots of issues that could be solved with this group like, we could carve off the financial part of the FRSG and assign it to the OC to build the pricing framework. Also, we have changed the RSTS (Reserve Sharing group Technical Subcommittee) to only meet as topics come up. That way we can still maintain the structure and members but limit the meeting to when there are topics to discuss.

NWPP RC Update
10/7/2015

Tony Burt
Manager of Operations- Vancouver

PEAKRELIABILITY
assuring the wide area view

Data Sharing

- Developing revised Universal Data Sharing Agreement (UDSA)
- Major Changes from previous UDSA:
  - Addition of WECC
  - Addition of Natural Gas Pipelines for certain data
  - Process for sharing data with third parties
  - Clean-up throughout
- Several open issues in discussion
- For more information, click HERE

PEAKRELIABILITY

Data Sharing Timeline

- **Aug 20 – First Draft UDSA posted**
  - Aug 20-Sep 21 – Comment Period
- Sep 9-10 – Board meeting – discuss first draft
- **Oct 5 – Face to Face meeting (Portland)**
- **Oct 12 – Second draft UDSA posted**
  - Oct 12-Nov 2 – Comment period
- **Nov 9 – Post recommended response to comments**
- Nov 13 – MAC webinar
- Nov 16 (tent.) – Open Board webinar
- **Nov 23 – Post near-final draft UDSA posted**
- Dec 8-9 – Board meeting – discuss any last direction/issues
- Dec 31 – Final version out for signature

What is the Reliability Messaging Tool (RMT)?

- A web-based, real-time application that will be used as the core operations messaging and communication tool.
- Users will be Peak, Balancing Authorities (BA) and Transmission Operators (TOP)
- As soon as RMT is operational, Peak will no longer use WECCNet.

Benefits of RMT

- Leverages Peak existing extranet infrastructure to deliver a more unified toolset.
- Provides greater accessibility to users without the need for specialized terminals.
- Provides built in message acknowledgement processing and tracking
- Provide capabilities to interface with Peak tools such as displays and logs
- Provides flexibility for future enhancements and customization

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Benefits of RMT (cont.)

- Acknowledgment feature:
  - Identifies clearly messages that must be acknowledged by recipient
  - Allows sender to easily track which recipients have acknowledged messages
  - Assures that important messages are read

6

PEAKRELIABILITY

Grid Security Exercise 2015

GridEx III Participant Map

7

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Grid Security Exercise 2015

GridEx III
GRID SECURITY EXERCISE 2015
NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

GridEx III November 18-19, 2015

Contact jhoyt@peakrc.com for information or contact Bill.Lawrence@nerc.net to enroll

8

PEAKRELIABILITY

Peak Reliability Synchrophasor Project (PRSP)

- PRSP is focused on:
  - Data quality
  - Expanded use of V&R ROSE voltage stability
  - Linear State Estimation (LSE)
  - Improvements to mode meter and oscillation detection tools
  - PMU management through the registry
  - Situational awareness improvements through improved visualization capabilities

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PRSP Initial Use Cases

- Operational Assessment Overview
  - Pi/ESRI or Power World
  - Frequency Event Detection
  - Phase Angle Deltas
  - RTCA/STCA
  - Weather/Fire/Earthquake/Tsunami
  - Facility Loading
  - Alarm Dashboard for Grid Events

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Iterative 3-day OPA Process

- New 3-day study process began after Labor Day
- Process is iterative which means:
  - Multiple studies for same day being performed (3 iterations)
  - Updating topology (COS), load and Path SOL data, where applicable
  - First iteration is 3 days out…last iteration is evening ahead
- Currently ramping up 3 new study engineers
  - Initial 3-day OPA focus on weekdays

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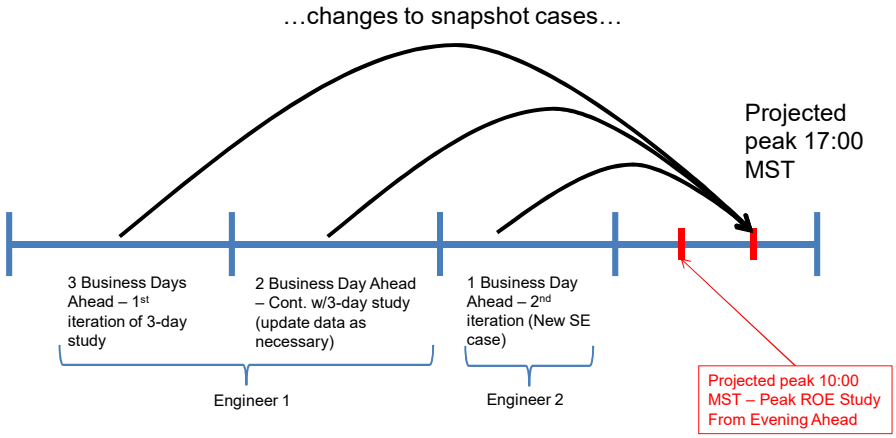
Overview of Peak's 3-Day Ahead Process



PEAKRELIABILITY

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NERC
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Essential Reliability Services Task Force (ERSTF)

North American Generator Forum

Brian Evans-Mongeon
September 24, 2015

RELIABILITY | ACCOUNTABILITY

NERC
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ERSTF History

- The Task force was formed in June 2014 under the umbrella of both Operating and Planning Committees (OC and PC)
- Taking from the 2001 “Building Blocks”, Task force produced a ‘Concept Paper’ as part of the first deliverable – explaining Essential Reliability Services (ERS)
- Developed measures that identify ERS and simultaneously produced the associated framework for those measures
- Data from volunteer entities was developed, tested and documented (Thanks to those entities)
- The product of this substantial effort is the draft Framework Report - which was sent out to OC and PC on August 25, 2015 for review and comments

ERSTF Recommendations

- Monitor the Measures and investigation of trends.
- Planning and operating entities should use the Industry Practices.
- Open sharing of experiences and lessons learned.
- All new resources to have the capability to support voltage and frequency.
- While beyond the formal scope of the ERSTF, the task force recognizes that Distributed Energy Resources (DERs) will increasingly affect the net distribution load that is observed by the Bulk Electric System.

ERSTF Measures

- Recommended Measures
  - Measure 1- Synchronous Inertial trend (Interconnection)
  - Measure 2 – Initial Frequency Deviation following largest contingency
  - Measure 3 - Synchronous Inertial trend (Balancing Area)
  - Measure 4 – Frequency Response
  - Measure 6 – Net Load Ramping Variability
  - Measure 7 – System Reactive Capability
- Industry practice recommendation
  - Measure 5 – Real time inertial model
  - Measure 9 – Voltage-System Performance
  - Measure 10 – Voltage: Short Circuit System Strength
- No longer being pursued
  - Measure 8 – Voltage Performance

Frequency Support Measures

- The industry recognizes:
  - Frequency support is essential to system reliability
  - Frequency support capability of the generation fleet is changing due to increasing use of non-synchronous generation, other changes in generation resource mix (e.g. coal retirement, increased use of natural gas fired generation).
  - It is important to monitor these changes and their impact on frequency support to address any issues in timely and effective manner (by e.g. incentivizing frequency support from new generation and load resources)

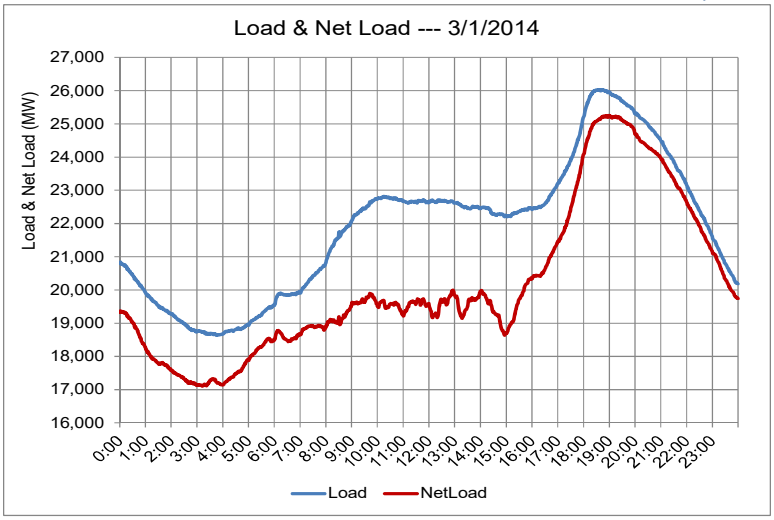
Proposed Frequency Support Measures

- ERSTF The ERSTF Frequency Support Sub-group considered the following measures and industry practices for adoption by the appropriate industry entities:
  - Minimum synchronous inertial response (SIR) historically and projected for the future (Measure 1 for interconnection and Measure 3 for BA).
  - Frequency deviation within the first 0.5 seconds following the largest contingency of the interconnection at minimum synchronous inertia conditions (Measure 2 for interconnection).
  - Comprehensive set of frequency response measures following observed contingency events (Measure 4).
  - Measure related to situational awareness monitoring synchronous inertia in real-time (Measure 5) was identified as industry best practice but not recommended as a measure.

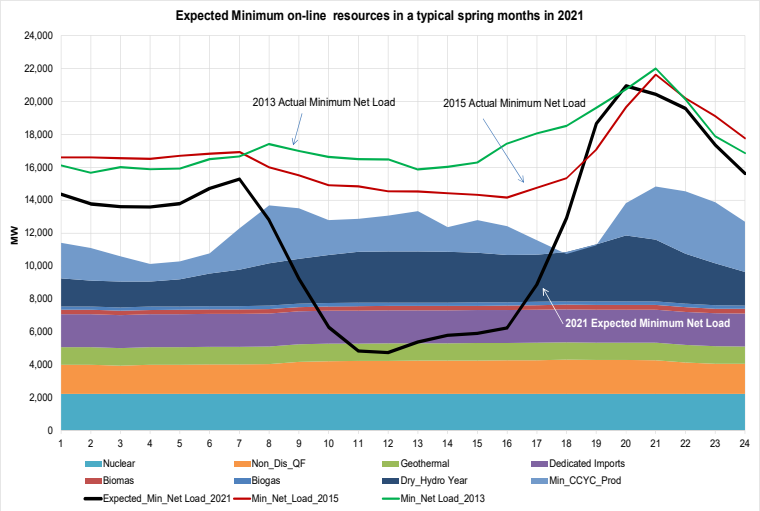
Ramping Variability

- High penetrations of non-dispatchable resources and/or VERs may require increased system ramping capability.
- ERSTF analysis indicates that ramping capability is not currently an issue for many BAs, but in CAISO, with a significant amount of VERs & non dispatchable resources, ramping is already a challenge.
  - Greater risk of over-generation during periods of low demand because some resources cannot be shut down due to long start -up times or contractual limits
  - Need to mitigate steep intra-hour net demand ramps and multi-hour net demand ramps
  - Need for more flexible resources with faster ramping capability
  - Need for resources to have the capability to stop and start multiple times per day
  - Greater difficulty in accurately forecasting operating needs of the system
  - Potential for rapid change in the intra-hour ramp direction
  - Any non-dispatchable resources can exacerbate minimum generation concerns

Actual load and net-load



Expected increased challenges



ERSTF Recommended NET Load Ramping Variability Measure

- The TF recommends Measure 6 as a measure that should be monitored & evaluated at the BA level and the data provided to NERC annually for industry wide trending and analysis.
- Measure 6 provides both a historical and future view of the maximum one-hour up/down & three hour up/down ramping requirements.
- The data requirements include one minute data (or the smallest sample rate available) and a projected build out of generation & load over the next three years.
- Additional considerations are provided in the framework report for more detailed analysis by BAs.

Voltage and Reactive Measures

- The industry recognizes:
  - Voltage management is essential to reliability,
  - Voltage management must encompass both baseline operations as well as contingency conditions,
  - Voltage management is best done at a sub-area/cluster level due to the inability to move reactive support long distances on the transmission system,
  - Voltage management can effectively and efficiently be done through a combination of static and dynamic reactive power resources coupled with adequate load power factor control,
  - The ERSTF Voltage and Reactive Sub-group considered the following measures and industry practices for adoption by the appropriate industry entities.

Voltage and Reactive Measures

- Measure 7: Reactive Capability on the System
  - The proposed measure would track system static and dynamic reactive resources as well as load power factors for distribution at the low side of transmission buses.
  - These quantities would be tracked by the BA on either the entire BA footprint or as appropriate at a sub-area/cluster level within the BA footprint.
  - These quantities would be gathered for peak, shoulder, and light load levels.
  - The NERC Performance Analysis Subcommittee (PAS) would develop data collection protocols and the NERC System Analysis and Modeling Subcommittee (SAMS) would review the data to develop industry trends.

Voltage and Reactive Measures

- Measure 9: Overall System Performance
  - The ERSTF considered a proposal to track system events that suggest stressed reactive capability or degraded voltage profiles.
  - Reactive and voltage performance for these events would be evaluated across all time horizons (planning, seasonal, real-time) to compare planned performance with real-time operations.
  - This evaluation would provide useful insight into the success of the planning process, document as-built systems, and confirm effective operational management of resources in real time.
  - The ERSTF concluded this type of post mortem analysis comports with various requirements in existing and proposed NERC standards and would fall under the existing Event Analysis Subcommittee (EAS) responsibilities.

Voltage and Reactive Measures

- Measure 10: System Voltage and Reactive Strength Performance
  - The ERSTF considered a proposal to measure and track system strength based on calculating short circuit ratios for sub-areas/clusters in the system.
  - Part One:
    - Planning/Transmission Coordinator will annually perform traditional short circuit evaluations per TPL-001-4 standard on their system short-circuit capability for the purpose of circuit breaker fault duty analysis.
    - The short circuit data from this assessment can be used to calculate the short circuit ratio (SCR) at busses as defined in IEEE standard 519-2014.
    - Where SCR in sub-areas/clusters are identified as low (typically < 3), entities should utilize additional analytical study techniques to further analyze the potential for FIDVR and voltage stability issues.

Voltage and Reactive Measures

- Measure 10: System Voltage and Reactive Strength Performance
  - Where there is a significant amount of inverter-based resources or other non-synchronous resources and the SCR is low an additional study process beyond the traditional short circuit ratio calculation in Part One is recommended.
  - Part Two:
    - Both ERCOT and GE have developed detailed study processes specifically designed to identify potential voltage control instability amongst groups of inverter-based resources or other non-synchronous resources.
    - The Planning Coordinators using these suggested study processes can then identify problem areas and develop remedial actions to prevent reliability issues.
  - ERSTF proposes that Study Process One and Two be considered as an industry practice.

Voltage and Reactive Measures

In summary

- Measure 7 Reactive Capability on the System, should become an approved measure and assigned to NERC PAS and SAMS
- Measure 8 Voltage Performance of the System, does not need to be pursued at this time
- Measure 9 Overall System Performance, is all ready covered under the NERC EAS responsibilities so no further action is needed
- Measure 10 System Voltage and Reactive Strength Performance, is a recommended industry practice for Planning and Transmission Planners

Next Steps-Framework Report

Framework Report

- Incorporate comments from OC/PC
  - Comments due October 1
- Finalize Framework Report
  - Deliver Framework Report to OC/PC October 13
- Seek OC/PC acceptance of Framework Report October 20
- December 7 BOT report review and vote
- December 9 – Release final report

Next Steps-Abstract

Report Abstract

- Abstract is intended to be a summary of key points for Policy Makers.
- OC/PC comments on Abstract due October 20.
- Release final Abstract to OC/PC for review November 20
- Seek OC/PC acceptance of Abstract December 15/16 standing committee meetings.
- December 17 deliver Abstract to BOT.

Abstract – Key Messages

- Goal is to inform, educate, and build awareness on the implications of the changing resource mix and how industry can evolve the system in a reliable manner
- Resource adequacy changing due to a variety of reasons, technology neutral, some technology advancing new capabilities
- Consider technical aspects of ERS when making decisions related to interconnecting new resources or market and tariff oversight
- Policy decisions have direct influence on changes in the resource mix, and thus can also affect the reliability of the bulk power system

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NERC EAS Update

NERC OC Meeting
September 15-16, 2015

RELIABILITY | ACCOUNTABILITY

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NERC EAS Update

- 12 Lessons Learned released in 2015
  - One pending
- EMS Conference
  - September 29-30 in Texas
  - Theme will be SO confidence in tools
- ERCOT's generating unit winter weather readiness program

NERC EAP Update

Revised NERC Event Analysis Process

-Main goal: Continued improvement

-Minor revisions to help improve and clarify the intent of the EAP

-Intro: Reinforced EOP-004 is a required standard, EAP is a voluntary process and they have different purposes

-It would be a disservice to industry to for the event lists to be the same

-Process: Minor clarifying changes to help the end user grasp the high level process

NERC EAP Update

Categories:

- Retired 1f
  - Unplanned evacuation from a control center facility for 30 minutes or more
- Retired 2b
  - Complete loss of SCADA and monitoring capabilities for 30 minutes or more
- Modified ***2c*** to clarify that reporting is based on an event that affects a number of facilities in a TOP's footprint
  - Voltage excursion on one or two buses is not the intent

NERC EAP Update

Retired Categories:

- Will not renumber the list
- Crossed out
- Added retirement dates and footnotes

Example:

~~Unplanned evacuation from a control center facility with BPS SCADA functionality for 30 minutes or more.~~ Retired on January 01, 2016[3]

[3]Category 1f was retired since category 1h will cover an unplanned evacuation of a Control Center if the unplanned evacuation significantly affects the entity's ability to make operating decisions for 30 continuous minutes or more

NERC EAP Update

- Appendix A was modified to clarify the timing requirements on the Brief Report and Event Analysis Report reports
- The timing requirements of Brief Reports were doubled in response to industry requests
- EAS's mission is to improve the quality and completeness of reports and not burden the industry with short time requirements

NERC EAP Update

Appendix C was modified to clarify expectations

Added

Item 1: NCR #

Item 8: A list of relevant sustained forced outages and the bus configuration is requested

Item 11: Description of emergency actions taken (if required)

Item 19: Corrective actions were included (if applicable)

NERC EAP Update

Next Steps

- EAS is seeking Approval on the revised EAP
- EAS is proposing a January 1, 2016 effective date
  - Allows industry to make appropriate revisions to processes
  - Creates a clean delineation for data and trending

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Questions and Answers