Final Notes
August 10, 2016

OPERATING COMMITTEE
May 11, 2016 – 1:00–5:00 PM
NWPP Offices – 7505 N.E. Ambassador Place, Suite R – Portland, Oregon
Portland/Vancouver Room

1. Introductions, Arrangements, and Agenda Changes Chad Edinger (TPWR), Chair

Chad Edinger welcomed everyone to the meeting and introductions were made around the room. The 17 Operating Committee (OC) members present constituted a quorum.

The meeting agenda is included as Attachment #1. A listing of attendees is included as Attachment #2.

2. Accept Meeting Notes – February 10, 2016 Don Badley, NWPP

Notes of the February 10, 2016 meeting, as revised and posted, were accepted by consent.

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

- Share TPC's list of planning tasks with OC. *In process.*
- NWPP staff will work with Greg Park to put together a game plan to work out a restoration training program. *Agenda Item 9.*
- NWPP staff will distribute an email to members that can be shared with their compliance people for their interest in pursuing the idea of developing a centralized portal for sharing data that can used for tracking communications for compliance. If there is sufficient interest NWPP will host a task force meeting. *Agenda Item 12.*
- NWPP Staff will contact the appropriate party to come to the next meeting to demonstrate the tool app developed during the MC Initiative effort. *Agenda Item 8.*

4. NWPP Corporation – Update Jerry Rust, NWPP

a. Forecast of Expenditures for 2015-16 – Status report
Jerry Rust reported that, to date, he estimates NWPP expenses will be under budget by $50,000-$100.000.

b. Forecast of Expenditures for 2016-2017 – Approval
Jerry Rust presented the Forecast of Expenditures (budget) for NWPP during the 2016-17 Operating Year; refer to Attachment #3. Jerry pointed out that the Operating Committee (OC) budget is decreasing by 8.39% due to less time spent on OC work. Regarding the overall budget, the biggest member (OC, TPC, or CG) increase is 3.7% over the 2015-16 budget.

Lloyd Linke motioned and Denise Lietz seconded the motion to approve the OC portion of the 2016-17 Forecast of Expenditures. The motion passed by unanimous consent.

c. E-learning – Personnel Training Meeting
Jerry Rust reposted that the number of continuing credit hours (CEH) provided, to date, is about 2.000 CEH. This includes face-to-face and and e-learning activity.

The next meeting for training coordinators within the NWPP is scheduled to occur on June 14 in the NWPP conference room. Contact Sabina Urdes or ChaRee DiFabio about information related to this meeting. This meeting will focus on the requirements of PER-002.

d. NWPP History – Book

Jerry Rust commented that the history of the Power Pool began with its formation in 1941 and he reported that a majority of executives from NW utilities have agreed to have the history of the Pool written and published in book form. These executives have also agreed to fund the publication, which is expected to be ~$3,000 per member. The book will detail the accomplishments of the NWPP OC. A publication time line will be established in the near future. Jerry will continue to provide status reports at future OC meetings until the project is complete.

5. NWPP Agreement – Update Denise Lietz (SCL), Task Force member

a. Group of 8 Report (Membership Agreement Work Group)

Denise Lietz provided a status report on the NWPP Agreement Work Group. She highlighted that this effort started back in 2014. The Agreement was initially drafted in 1995 and no longer reflects current day operations and practices. And, several of the definitions are out of date as well. The Agreement needs to incorporate new NERC terminology and requirements, and to allow for a more flexible foundation going forward. During the same time the Agreement revisions started, the Market Assessment and Coordination Committee (MC) effort began. It was agreed to put Agreement work on hold until there was a known outcome of the MC. During the February OC meeting it was evident that the MC work was drawing to a close, so a new group was appointed to work on the Agreement – this included 2 representatives from each committee (i.e., OC, TPC, CG, and RSGC). They recently met to address three tasks, as follows:

(1) Incorporate language for an executive forum (no authority over committees) into the agreement
(2) Review the most current redline version of the Agreement are the proposed revisions still valid? Are any other modifications necessary or needed?
(3) Method for communication of document – what is substance and what is not?

The group is working to put together a new concept paper for distribution to each of the respective committees. If you are interested in participating with the group, the meetings are open.

b. OC Member Replacement

Eddie Elizeh was one of the two OC representatives elected to serve on the Membership Agreement Work Group but he has been reassigned and is no longer able to serve in that capacity. Meg Albright, BPA, requested that she be considered as a candidate to represent the second OC position on the Group. By consensus, the OC agreed to appoint Meg as one of their two representatives on the Group. Meg commented that Susan Millar (BPA) will serve as her alternate.

6. Executive Forum - Information Jerry Rust, NWPP

Jerry Rust reported that an ad hoc meeting of about 15 executives met on April 26. This group is not a NWPP endeavor and their objectives are not known and no commitments have been made. The group met as a result of an outcry from the MC meetings.

7. Transmission Planning Committee (TPC) Dana Reedy, NWPP

a. Meeting – Update

Dana Reedy reported the TPC approved their portion of the NWPP budget.

Also, Dana reported that there is a PowerWorld Users Group whose meetings are generally hosted by WECC. It appears most of the NWPP TPC uses PowerWorld and would like to begin facilitating/sponsoring user group meetings here at the NWPP. The TPC Chair is going to reach out to both the WECC and the User Group Chair to determine if this is possible.

Jerry Rust reported the NWPP will be holding the Engineers Forum on September 15-16, 2016 in Tacoma, Washington. He provided an overview of the proposed draft agenda; refer to Attachment #4. The agenda is expected to be finalized and posted by June 1st and with items of interest to both planners and operators. Jerry reminded everyone that the Engineers Forum is open to all employees from NWPP members.

b. Northwest Operational Planning Study Group (NOPSG) – Report

Dana Reedy reviewed the study results from NOPSG; refer to Attachment #5.

8. MC Initiative – Developed Apps Jim Farrar, TID

Jim Farrar discussed the Regional Flow Forecast (RFF) and the Resource Monitoring and Deliverability (RMD) tools developed as a result of the MC Initiative; refer to Attachment #6. Jim commented that the MC Initiative is only funded through 2016. Chad Edinger listed the entities funding the MC Initiative through the end of this year.

9. NWPP Restoration Training with Peak Reliability – Update Greg Park, CHPD

Greg Park reported the NWPP Restoration Training session will be discussed on June 14th at the Training Coordinators meeting. He will discuss this topic with others prior to the meeting and hopes to utilize this meeting to develop a plan for the NWPP sub-Region.

10. Peak Reliability RC – Update Tony Burt, Peak Reliability

Tony Burt reported Peak is trying to get the Reliability Messaging Tool (RMT) up and tested. Final testing is expected to occur on May 20th. A "go-live" notification will be sent to all participants.

a. Measuring System Inertia In Real-time Madhukar Gaddam, Peak Reliability

Madhukar Gaddam discussed the system inertia calculation software application tool developed by Peak. The tool calculates total inertia using all on-line units' MVA and those units' inertia constants (H), e.g., MVA*H. Refer to Attachment #6. Madhukar explained they don't yet have all the data they need in order to calculate total system inertia as well as inertia for each BA.

11. NERC – OC Meeting update — Jerry Rust, NWPP

Jerry Rust reported that the next NERC OC Meeting will be held on June 6, 2016. NERC is no longer requiring seasonal (winter/summer) assessments; rather "special assessments" are in the offing. Recently, they completed a special assessment on impact of natural gas supply on the electric grid.

The NWPP will continue to produce a summer and winter assessments for the NWPP Area. It appears the current assessment is status quo.

12. WECC – Update — Chad Edinger, TPWR

a. WECC OC Meeting Update

Chad Edinger reported Rich Hydzik made an Organizational Structure Review Task Force (ORSTF) presentation regarding the future of the WECC committees. The report addressed the value of the committees, questioning if any of the existing committees should be dissolved or, if so, which ones should be kept? WECC is requesting comments on the ORSTF recommendations.

b. NERC Standards – Proposed documentation portal

Chad reported that Stacen Tyskiewicz, the WECC SIMS Chair, gave a proposal for how parties in WECC could approach compliance data submittals (TOP-003-3 effective 1/1/17). Possibly create a portal for users to upload documents and and standardize specifications. Follow-up meeting for this group at Peak RC on June 2nd. This will be a WECC wide meeting. Her proposal can be found in the WECC OC notes.

13. Current Operations — All

ChaRee DiFabio provided a report out on the recent NWPP's NW SW Dispatchers Meeting; refer to Attachment #7. Approval was granted by the NWPP OC to support the Spring Dispatchers meeting with APDA in 2017.

Darren Wilkie provided a quick report out on the Fort McMurray fires. Last week, forest fires in Northeast Alberta forced the evacuation of 88,000 people including the entire city of Ft. McMurray. The fire quickly entered the city and destroyed 2500 structures (homes and businesses) which is approximately 15% of the city. Two 240 kV transmission lines, six 138kV lines, and multiple distribution feeders were damaged and tripped due to the fires. More than 1200 MW of generation and load gradually came off-line resulting in approximately one million barrels of oil per day production loss from the area. It will take weeks before line repairs, generation and load return to normal due to the evacuation and difficulty accessing the remote line locations. The fire is still burning and it is thought that only rain will put it out. As of May 10th, the fire has burned 565,000 acres.

Asher Steed reported that BC has had a very active fire season. Dozens of poles burned. It took 4-5 days to get 1,000s of customers back on line.

14. OC Goals for 2016-2017 Operating Year – Review — Chad Edinger, Chair

Chad Edinger reviewed the goals proposed for the OC during the 2016-17 Operating Year; refer to Attachment #8. The goals identified in Attachment #8 were accepted by consensus.

15. Review of Action Items Decided at this Meeting Don Badley, NWPP

- Share TPC's list of planning tasks with OC. *When TPC completes the list.*
- Meg Albright elected to serve as one of two OC representatives to the group of 8 dealing with the Membership Agreement.
- NWPP Staff will make arrangements for a tour of Centralia Thermal Plant that is part of the September 2016 Engineer's Forum.

16. Future Meetings

a. OC Meeting Dates for 2016
- August 10 – Portland, OR
- October 13 – Portland, OR

ADJOURN

ATTACHMENTS

NWPP OPERATING COMMITTEE MEETING

May 11, 2016

Agenda
May 11, 2016

OPERATING COMMITTEE
May 11, 2016 – 1:00–5:00 PM
NWPP Offices – 7505 N.E. Ambassador Place, Suite R – Portland, Oregon
Portland/Vancouver Room

✓ *Action Item*

1. **Introductions, Arrangements, and Agenda Changes** Chad Edinger (TPWR), Chair

✓ 2. **Accept by Consensus Meeting Notes – February 10, 2016** Don Badley, NWPP

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

- Share TPC's list of planning tasks with OC.
- NWPP staff will work with Greg Park to put together a game plan to work out a restoration training program.
- NWPP staff will distribute an email to members that can be shared with their compliance people for their interest in pursuing the idea of developing a centralized portal for sharing data that can used for tracking communications for compliance. If there is sufficient interest NWPP will host a task force meeting.
- NWPP Staff will contact the appropriate party to come to the next meeting to demonstrate the tool app developed during the MC Initiative effort.

4. **NWPP Corporation – Update** Jerry Rust, NWPP

a. Forecast of Expenditures for 2015-16 – Status report
✓ b. Forecast of Expenditures for 2016-2017 – Approval
c. E-learning – Personnel Training Meeting
d. NWPP History – Book

5. **NWPP Agreement – Update** Denise Lietz (SCL), Task Force member

a. Group of 8 Report
✓ b. OC Member Replacement

6. **Executive Forum - Information** Rust

7. **Transmission Planning Committee** Dana Reedy, NWPP

a. Meeting – Update
b. Northwest Operational Planning Study Group – Report

8. **MC Initiative – Developed Apps** Jim Farrar, TID

9. **NWPP Restoration Training with Peak Reliability – Update** Greg Park, CHPD

10. **Peak Reliability RC** – Update Tony Burt, Peak Reliability

a. Measuring system inertia in real-time

NORTHWEST PowerPool

Agenda
May 11, 2016

11. **NERC** – OC Meeting update — Rust

12. **WECC** – Update — Edinger

a. WECC OC Meeting Update
b. NERC Standards – Proposed documentation portal

13. **Current Operations** — All

✓ **14.** **OC Goals for 2016-2017 Operating Year – Review and consensus approval** — Edinger

15. **Review of Action Items Decided at this Meeting** — Badley

16. **Future Meetings**

a. OC Meeting Dates for 2016
- August 10 – Portland, OR
- October 13 – Portland, OR

ADJOURN

NWPP Operating Committee Meeting
May 11, 2016
Meeting Attendance

Name	Organization
Darren Wilkie	Alberta Electric System Operator
Bryan Cox	Avista Utilities
Mark Willis	Balancing Authority of Northern California
Margaret (Meg) Albright	Bonneville Power Administration
Salah Kitali	Bonneville Power Administration
Jesus Lopez	Grant County PUD
CJ Ingersoll	Gridforce Energy Management, LLC
Chris Nebrigich	Idaho Power
Julie Reichle	NorthWestern
Kathryn Downey	PacifiCorp
Maduhkar Gaddam	Peak Reliability
Tony Burt	Peak Reliability
Bob Frost	Portland General Electric
Thomas Bagnell	Puget Sound Energy
Denise Lietz	Seattle City Light
Chad Edinger	Tacoma Power
James Farrar	TID Water and Power
Lloyd Linke	Western Area Power Administration - Upper Great Plains

Present via Teleconference

Asher Steed	B. C. Hydro and Power Authority
Greg Park	Chelan County P.U.D.
Jeff Heminger	Douglas County P.U.D.
Raj Hundal	Powerex

NWPP Staff Support

Jerry Rust	Northwest Power Pool
ChaRee DiFabio	Northwest Power Pool
Don Badley	Northwest Power Pool
Harlan Tallman	Northwest Power Pool
Dana Reedy	Northwest Power Pool

NORTHWEST POWER POOL
Reliability through Cooperation

2016-2017 Forecast of Expenditures for the Operating Committee

All Northwest Power Pool Committees must approve their respective forecast of expenditures in accordance with the NWPP Agreement

Article IX: Finances

- Section 9.1.1 Forecast of OC Expenses: The NWPP staff shall prepare an annual NWPP budget forecast of OC expenses for presentation to the OC for the approval by the OC Members. The OC Members shall have final approval authority by two-thirds affirmative vote over the annual and supplemental NWPP budgets allocable to OC Members.

Northwest Power Pool General Services Agreement
Section 2. Annual Budget Forecast and Support Services

Section 2.1 Development and Approval of Annual Budget Forecast. Not less than 60 days before the start of each fiscal year, the NWPP Corporation will prepare and present to those Pool Committees and Groups whose approval is required under the Northwest Power Pool Agreement an Annual Budget Forecast. An Annual Budget Forecast will be deemed approved for purposes of this Agreement if (but only if) it is approved in accordance with the voting procedures specified in the Northwest Power Pool Agreement for the Pool Committee and Group approval of Annual Budget Forecast.

Forecast of Expenditures July 1, 2015 to June 30, 2016 vs. Estimate *(10 Months actual + 2 Months est.)*

	Forecasted 2015-2016	Estimated	Change
Forecast	$3,165,582	$3,110,000	–$55,582

Estimated annual expenditure as compared to budget ~ 98.2%

5

NERC CEH Training

- NERC CEH training hours provided over July1, 2015 to June 30, 2017 (as of May 1, 2016)
  - *Face-to-Face ~ 2,000 CEH*
  - *On-Line E-Learning ~ 2,000 CEH*
  - *Approximately 1,000 CEH over last year*

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OC Forecast of Expenditures
July 1, 2016 to June 30, 2017

	2015-2016	2016-2017	% Change
OC Budget	$1,166,016	$1,152,464	
CEH Adders	$ 92,000		
Total	$1,258,016	$1,152,464	–8.39%

Forecast of Expenditures
July 1, 2016 to June 30, 2017

- 56% of the budget is salaries of FTEs
- 27% of the budget is associated with employee overheads such as health insurance, pension, and others
- 7% of the budget is associated with office expense
  - 90% of the budget is associated with employees and office (this was 85% for the period)
- ~10% of the budget is variable (meetings and meeting expenses (Note this 15% for the last period)

Forecast of Expenditures
July 1, 2016 to June 30, 2017

- The percentage change for any one member of the NWPP from the July 1, 2015 to June 30, 2016 Forecast of Expenditure as compared to the July 1, 2016 to June 30, 2017 Forecast of Expenditure ranges:
  - **–8.36% (decrease) to a 3.70% (increase)**

OC Forecast of Expenditures
July 1, 2016 to June 30, 2017

Motion for approval

The OC portion of the Northwest Power Pool corporate forecast of expenditures for the period July 1, 2016 to June 30, 2017 of $1,152,464.

Any questions before we get started with 2016-2017

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NORTHWEST PowerPool

Northwest Power Pool
2016 Engineering Forum
September 15 & 16, 2016
Tacoma Power Offices – Tacoma, WA

DRAFT AGENDA

September 15, 2016

1000-1015	Welcome, Introductions, and Meeting arrangements	Dana Reedy, NWPP
1015-1045	Under Voltage Load Shedding Studies	TBD, Puget Sound Energy
1045-1115	Post-Contingency Shunt Switching	Tracy Rolstad, Avista
1115-1200	Voltage Stabilities – IROL	TBD, Peak RC
1200-1300	*NWPP Hosted Lunch*	
1300-1400	Wind Farm Operational Issue	TBD, BPA
1400-1500	Renewable Technologies in Nevada	Jay Campbell, NV Energy
1500-1515	*Break*	
1515-1600	Integration of Solar and DER into CAISO	TBD, BANC / CAISO
1600-1645	How does EIM Work?	TBD, PAC
1645-1700	Arrangements for Tomorrow	Reedy

September 16, 2016

0700-0745	*Assemble for Tour – Roll Call*	Reedy
0745-0915	Travel to Centralia	Charter Bus
0915-1200	Tour of Centralia Operations	TransAlta
1200-1400	Box Lunch & Travel to Tacoma	Charter Bus

NORTHWEST POWER POOL
Reliability through Cooperation

NOPSG Report

for the Operating Committee

May 11, 2016

Local Area Summer Studies Showing No Issues

- *Tacoma Power (TPWR)*
- *Puget Sound Energy (PSE)*
- *Snohomish County PUD (SNPD)*
- *Seattle City Light (SCL)*
- *Grant County PUD (GCPD)*
- *Chelan County PUD (CHPD)*
- *Western Area Power Administration Upper Great Plains (WAUW)*
- *Portland General Electric (PGE)*

Path Summer Studies

- Brownlee East (W-E) – Path 55
- Montana Northwest (W-E and E-W) – Path 8
- Montana-Idaho (N-S) – Path 18
- Montana Southeast (N-S and S-N) – Path 80
- Path C (N-S and S-N) – Path 20 vs Bridger West – Path 19

NORTHWEST PowerPool

NOPSG 2016 Summer Season Path System Operating Limits (NOPSG March 24, 2016)

Path Description	WECC PATH NO.	WECC Path Catalog Rating MW	Path Limitation	2016 Summer SOL (MW)	2016 Spring SOL (MW)	2015-16 Winter SOL (MW)	2015 Summer SOL (MW)
Alberta - British Columbia	1	1000 E-W 1200 W-E	Transient stability Transient stability	450-1000 E-W 600-800 W-E***	450-1000 E-W 600-800 W-E***	450-1000 E-W 600-800 W-E***	450-1000 E-W 600-1200 W-E
Northwest - Canada	3	3150 N-S 3000 S-N	Transient stability Thermal	3150 N-S 2000-3000 S-N	3150 N-S 1300-3000 S-N	3150 N-S 850-2750 S-N	3150 N-S 2000-3000 S-N
West of Hatwai	6	4277 E-W	Thermal	4275 E-W	4275 E-W	4250 E-W	4275 E-W
Montana - Northwest	8	2200 E-W 1350 W-E	Pre-contingency Voltage Performance Thermal	**2200 E-W*** **1030-1245 W-E***	2200 E-W 1200-1350 W-E	2200 E-W 1330-1350 W-E*	2200 E-W* 1100-1250 W-E*
Idaho - Northwest	14	2400 E-W 1200 W-E	Thermal Thermal	2175 E-W 1200 W-E	2175 E-W 1200 W-E	2400 E-W 1200 W-E	2175 E-W* 1200 W-E*
Sierra - Idaho	16	500 N-S 360 S-N	Thermal Thermal	478 N-S 262 S-N	478 N-S 262 S-N	478 N-S 262 S-N	478 N-S 262 S-N
Borah West	17	2557 E-W	Thermal	2557 E-W	2557 E-W	2557 E-W	2557 E-W
Montana - Idaho	18	383 N-S 256 S-N	Voltage Change Thermal	**383 N-S*** 256 S-N	383 N-S 256 S-N	383 N-S 256 S-N	383 N-S* 256 S-N
Bridger West	19	2400 E-W	Voltage Change & Thermal	**2400 E-W***	2400 E-W	2400 E-W	2400 E-W
Path C	20	1600 N-S 1250 S-N	Voltage Change & Thermal Thermal	**1600 N-S*** **900-1250 S-N***	1600 N-S 955-1250 S-N	1600 N-S 900-1250 S-N	1600 N-S 900-1250 S-N
Sierra - PG&E	24	160 E-W 160 W-E	Thermal Thermal	50-105 E-W 100 W-E	105 E-W 100 W-E	50-105 E-W 100 W-E	50-105 E-W 100 W-E
Sierra - Utah	32	440 E-W 235 W-E	Voltage Change Voltage Change	355 E-W 235 W-E	355 E-W 235 W-E	355 E-W 235 W-E	355 E-W 235 W-E
Brownlee East	55	1915 W-E	Voltage Change & Thermal	**1915 W-E***	1915 W-E	1915 W-E	1915 W-E
PDCI	65	3100 N-S 3100 S-N	Voltage stability & transient stability	3100 N-S** 2200 S-N	3100 N-S** 2200 S-N	3100 N-S***** 2200 S-N	3100 N-S** 2200 S-N
COI + NW - Sierra	66	4800 N-S 3675 S-N	Voltage stability & transient stability (& thermal summer 2015)	4800 N-S** 3675 S-N	4800 N-S** 3675 S-N	4800 N-S 3675 S-N	4800 N-S** 3675 S-N
North of John Day	73	(NR) 8400 N-S	Voltage stabilty	8000 N-S**	8000 N-S**	7200 N-S	8000 N-S**
Hemingway - Summer Lake	75	1500 E-W 550 W-E	Thermal Thermal & Reactive margin	1500 E-W 550 W-E	1500 E-W 550 W-E	1500 E-W 550 W-E	1500 E-W* 550 W-E*
Northwest - Sierra	76	300 N-S 300 S-N	Voltage Change Voltage Change	300 N-S 270 S-N	300 N-S 300 S-N	300 N-S 300 S-N	300 N-S 270 S-N
Montana - Southeast	80	(NR) 600 N-S (NR) 600 S-N (HL) (NR) 600 S-N (LL)	Thermal Transient stability Transient stability	**600 N-S*** **390-600 S-N (HL)*** 488-600 S-N (LL)	600 N-S 455-600 S-N 278-600 S-N	600 N-S 416-600 S-N 503-600 S-N	600 N-S 390-600 S-N (HL) 488-600 S-N (LL)
Montana Alberta Tie Line	83	325 N-S 300 S-N	Thermal Thermal	127-325 N-S 300 S-N	10-325 N-S 300 S-N	325 N-S 300 S-N	127-325 N-S 300 S-N

Notes

* - Indicates Studies Performed For the Operating Season. Numbers shown in **blue** indicate studies conducted for current operating season.
** - Indicates Daily Studies Performed For the Operating Season
*** - 800 MW limit based on AESO studies. BCHA studies support 1200 MW.
**** - Indicates revised rating based on studies for summer 2015 (rev Mar 31, 2015)
***** - 2000 MW until upgrades completed in January 2016
Table entries with a range of numbers indicate a nomogram is used for the path
(NR) - Indicates Path Has Not Been Rated
Path Rating numbers highlighted in red indicate a new path rating
Numbers in parenthesis () are SOL limits that are subject to additional equipment installed & operating, or completion of the WECC 3-phase rating process. The following paths indicate required action:

NOPSG 2016 Summer Season Path System Operating Limits (NOPSG March 24, 2016)

Path Description	WECC PATH NO.	WECC Path Catalog Rating MW	Path Limitation	2016 Summer SOL (MW)	2016 Spring SOL (MW)	2015-16 Winter SOL (MW)	2015 Summer SOL (MW)
Alberta - British Columbia	1	1000 E-W 1200 W-E	Transient stability Transient stability	450-1000 E-W 600-800 W-E***	450-1000 E-W 600-800 W-E***	450-1000 E-W 600-800 W-E***	450-1000 E-W 600-1200 W-E
Northwest - Canada	3	3150 N-S 3000 S-N	Transient stability Thermal	3150 N-S 2000-3000 S-N	3150 N-S 1300-3000 S-N	3150 N-S 850-2750 S-N	3150 N-S 2000-3000 S-N
West of Hatwai	6	4277 E-W	Thermal	4275 E-W	4275 E-W	4250 E-W	4275 E-W
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Idaho - Northwest	14	2400 E-W 1200 W-E	Thermal Thermal	2175 E-W 1200 W-E	2175 E-W 1200 W-E	2400 E-W 1200 W-E	2175 E-W* 1200 W-E*
Sierra - Idaho	16	500 N-S 360 S-N	Thermal Thermal	478 N-S 262 S-N	478 N-S 262 S-N	478 N-S 262 S-N	478 N-S 262 S-N
Borah West	17	2557 E-W	Thermal	2557 E-W	2557 E-W	2557 E-W	2557 E-W
Montana - Idaho	18	383 N-S 256 S-N	Voltage Change Thermal	**383 N-S*** 256 S-N	383 N-S 256 S-N	383 N-S 256 S-N	383 N-S* 256 S-N
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Path C	20	1600 N-S 1250 S-N	Voltage Change & Thermal Thermal	**1600 N-S*** **900-1250 S-N***	1600 N-S 955-1250 S-N	1600 N-S 900-1250 S-N	1600 N-S 900-1250 S-N
Sierra - PG&E	24	160 E-W 160 W-E	Thermal Thermal	50-105 E-W 100 W-E	105 E-W 100 W-E	50-105 E-W 100 W-E	50-105 E-W 100 W-E
Sierra - Utah	32	440 E-W 235 W-E	Voltage Change Voltage Change	355 E-W 235 W-E	355 E-W 235 W-E	355 E-W 235 W-E	355 E-W 235 W-E
Brownlee East	55	1915 W-E	Voltage Change & Thermal	**1915 W-E***	1915 W-E	1915 W-E	1915 W-E
PDCI	65	3100 N-S 3100 S-N	Voltage stability & transient stability	3100 N-S** 2200 S-N	3100 N-S** 2200 S-N	3100 N-S***** 2200 S-N	3100 N-S** 2200 S-N
COI + NW - Sierra	66	4800 N-S 3675 S-N	Voltage stability & transient stability (& thermal summer 2015)	4800 N-S** 3675 S-N	4800 N-S** 3675 S-N	4800 N-S 3675 S-N	4800 N-S** 3675 S-N
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Northwest - Sierra	76	300 N-S 300 S-N	Voltage Change Voltage Change	300 N-S 270 S-N	300 N-S 300 S-N	300 N-S 300 S-N	300 N-S 270 S-N
Montana - Southeast	80	(NR) 600 N-S (NR) 600 S-N (HL) (NR) 600 S-N (LL)	Thermal Transient stability Transient stability	**600 N-S*** **390-600 S-N (HL)*** 488-600 S-N (LL)	600 N-S 455-600 S-N 278-600 S-N	600 N-S 416-600 S-N 503-600 S-N	600 N-S 390-600 S-N (HL) 488-600 S-N (LL)
Montana Alberta Tie Line	83	325 N-S 300 S-N	Thermal Thermal	127-325 N-S 300 S-N	10-325 N-S 300 S-N	325 N-S 300 S-N	127-325 N-S 300 S-N

Notes

* - Indicates Studies Performed For the Operating Season. Numbers shown in **blue** indicate studies conducted for current operating season.

** - Indicates Daily Studies Performed For the Operating Season

*** - 800 MW limit based on AESO studies. BCHA studies support 1200 MW.

**** - Indicates revised rating based on studies for summer 2015 (rev Mar 31, 2015)

***** - 2000 MW until upgrades completed in January 2016

Table entries with a range of numbers indicate a nomogram is used for the path (NR) - Indicates Path Has Not Been Rated

Path Rating numbers highlighted in red indicate a new path rating

Numbers in parenthesis () are SOL limits that are subject to additional equipment installed & operating, or completion of the WECC 3-phase rating process. The following paths indicate required action:

This document is a non-binding compilation of information shared through the NOPSG process. Formal submittal of the SOLs are the responsibility of the respective Transmission Operators. This document does not constitute a compliance submittal by any party.

Next Meeting/Conference Call
August 23, 2016
Paths to Review:

- Montana Southeast (N-S and S-N) – Path 80
- COI + NW-Sierra/PDCI/N of John Day (N-S) – Paths 66, 76, 65, and 73
- Borah West (E-W) – Path 17

NORTHWEST PowerPool

Any questions?

NORTHWEST PowerPool

System Inertia Calculation
Version 1.0

Madhukar Gaddam, Peak Reliability

May 11, 2016

INTRODUCTION

The North American Electric Reliability Corporation (NERC) Planning Committee and Operating Committee jointly created the Essential Reliability Services Task Force (ERSTF) in 2014 to consider the issues that may result from the changing generation resource mix. The purpose of the ERSTF is to develop measures, use data from across North America to assess the validity of these measures, and provide insight into trends and impacts of the changing resource mix. The ERSTF established three technical sub-teams focusing on 1) frequency support, 2) ramping capability, and 3) voltage support.

Frequency Support sub team developed two measures (Measure 1 and Measure 3) to monitor Synchronous Inertial Respose (SIR) at an Interconnection level and at Balancing Authority (BA) level. In order to monitor SIR, it is required to have the total Inertia constant (H) and H*MVA data of all online units at Interconnection level and BA Level

INERTIA CALCULATION

PEAK developed a software application to calculate total Inertia constant (H) and H*MVA of all online units at interconnection and BA level. The new application runs once every minute in Energy Management System (EMS) host system. It calculates H and H*MVA data and writes the data into SCADA points, where MVA is the rated MVA of the unit. The data of all inertia SCADA points are historized and all points are available to share via ICCP. Following assumptions are used in calculating total inertia:

- Unit online status is determined based on Unit output MVA. Unit oupt MVA is calculated using State Estimation solution MW, MVAR values and 5MVA is used as threshold to determine whether the unit is online or not. The purpose of the threshold is to filter out units that are in the process of synchronizing with the system as well as filter out some telemetry errors
- Inertial contribution from online synchronous condensers or generating units operating in synchronous condenser mode are included. 5MVA threshold automatically includes the units in Synchronous condenser mode with reactive power output greater than +/- 5MVAR

INERTIA CALCULATION *(CONTINUED)*

- Units in pump mode are included in System inertia calculation. The 5MVA threshold automatically includes the units in pump mode with load greater than 5MW.
- Total system inertia is calculated as MVA*seconds at interconnection level and BA level.
- At Peak, State Estimator runs every minute and Inertia values are also calculated once every minute based on State Estimation solution values and updated in SCADA. They SCADA values are sent to external entities over ICCP upon change.
- Unit Inertia Constant (H) values are loaded into West Wide System Model (WSM) based on WECC Basecase dynamic data. WECC Basecase versus WSM mapping is used to identify the units in WSM.
- If there is no mapping available between WECC Basecase and WSM, inertia constant value is initialized with ZERO.

NWPP – NW SW APDA Dispatchers Meeting Report

NWPP OC Meeting

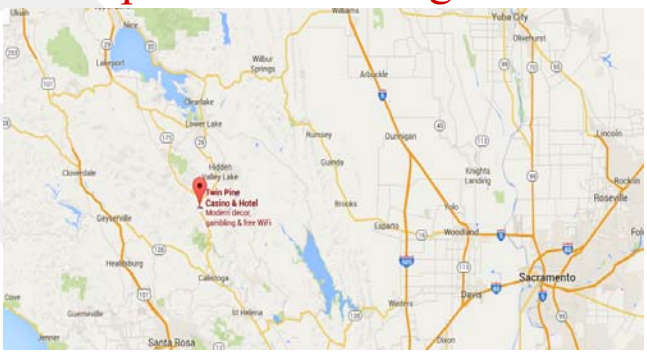
May 11, 2016

NWPP – NW SW APDA Dispatchers Meeting

May 3-4, 2016

Twin Pine Casino & Hotel

Middletown, CA



NWPP – NW SW APDA Dispatchers Meeting

- A BIG THANKS to Calpine
  - Ken Beishir, Calpine APDA Representative
  - Buffy Longoria, Calpine Support and "GO-TO" and
  - Evan Willig and Dean Cooley, the very knowledgeable Calpine Geyser Tour Guides

Attendance

- 33 Meeting Attendees
  (*not including NWPP staff*)
  19 Attendees from the NW
- 2015 - Spokane, WA ~ 45 Attendees
- 2017 – Portland, OR ~ Iberdrola *may* host

Agenda & Continuing Education

May 4

0745-0800	Welcome, Introductions, and Meeting arrangements	Ken Beishir, Calpine APDA - Host & ChaRee DiFabio, NWPP
0800-1200	WECC 1 RAS Pilot – (qualified for 4 CEH)	Jackie Perlette, IncSys and Steve Auradou, PG&E
1200-1300	*Lunch Break*	
1300-1500	Operation Planning– (qualified for 2 CEH)	Kevin Conway, Intellibind
1500-1515	*Break*	
1515-1700	AESO HVDC Links – (qualified for 2 CEH)	Greg Rahn and Rick Webb AESO
1700-1730	NWPP Training Initiatives	David Pennington, NWPP

May 5

0745-0800	Meeting Arrangements	Ken Beishir, Calpine APDA - Host & ChaRee DiFabio, NWPP
0800-1200	High Level SOL Methodology for the West (qualified for 4 CEH)	Philip Savage, Peak RC
1200-1700	Calpine Hosted Lunch & Geyser Tour (Transportation included to and from site)	

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Continuing Education Hours

WECC 1 RAS Pilot – (4 CEH)
Operation Planning– (2 CEH)
AESO HVDC Links – (2 CEH)
High Level SOL Methodology for the West (4 CEH)

12 CEH available to earn
33 Individuals in attendance

A total of 396 CEH earned

6

Calpine's Geothermal Geyser Tour

- Calpine Geothermal Visitors Center

www.geysers.com

NORTHWEST PowerPool

Calpine's Geothermal Geyser Tour

- Calpine's Geothermal Operations span 45 square miles
- 400 Steam Wells
- 80 Injection Wells
- 20 Units
  - ~1750 installed capacity, ~720 MW output

NORTHWEST PowerPool

Calpine's Geothermal Geyser Tour

NORTHWEST PowerPool

OC Support for next spring meeting with the APDA?

NORTHWEST PowerPool

Proposed to Operating Committee: May 11, 2016
Last Reviewed: May 11, 2016

Operating Committee Goals
June 2016 through June 2017

GOAL – OC – Industry Changes

Stay current with industry changes as they relate to the NERC Functional Model.

Action Plan

- NWPP Staff to educate OC on changes of the NERC Functional Model. (August 2016)
- Provide ongoing updates to the NERC Functional Model as they occur.

Stay current with industry changes as they relate to renewable energy and the CAISO.

Action Plan

- NWPP Staff and Chair assure pertinent items appear on each OC Meeting Agenda, e.g., wind & solar integration, NWPP member updates of CAISO Issues, including EIM (Energy Imbalance Market) and PTO (Participating Transmission Owners).

Stay current with industry changes as they relate to NERC Resources Subcommittee.

Action Plan

- Discuss all work and issues assigned to the Resources Subcommittee as they may relate to the NWPP OC.
- Discuss any current requests for comment.

GOAL – Review of Reliability Standards

Stay current on new and revised FERC Order 693 (Operations and Planning) WECC and NERC reliability standards. (with the exception of the BAL-002 standards as they belong in the RSG and BAL-003 for FRSG)

Action Plan

- NWPP OC Chair to provide an update on current comments and votes at NERC and WECC.
- NWPP staff to provide updates on changes to reliability standards.
- Prior to each meeting NWPP staff to solicit questions, comments, and suggestions from OC members regarding reliability issues (Standards, Criteria, Guidelines, & etc.)

GOAL – WECC Coordinated Off-Nominal Frequency Load Shedding Plan

Action Plan

- NWPP corporate staff to report at least once a year to the Operating Committee with respect to the review of the WECC Effectiveness report to include addressing compliance (armed load, relay settings, etc.)
- Assure NWPP representation on the WECC UFLS Review Group.

Proposed to Operating Committee: May 11, 2016
Last Reviewed: May 11, 2016

GOAL – NWPP Certified Training of the following:

Face-to-face programs:

Frequency Management (NWPP_070_FM)
Voltage Issues (NWPP_070_VI)
Underfrequency Load Shedding (NWPP_070_UFLS)
Annual Energy Emergency Plan Review and Update (NWPP_070_AEEPRU)
Emergency Response Team Simulation (NWPP_070_ERTS)

Action Plan

- Discuss adequacy of current face-to-face training courses including additions or deletions. (August 2016)
- Establish an annual training schedule for the NWPP Membership. (February 2017)

E-training (NWPP Learning Management System):

Action Plan

- NWPP staff to further expand e-training by holding the bi-annual training coordinator meetings.
- NWPP to monitor the outcome of the recommendations associated with the existence of the WECC Operations Training Subcommittee (OTS).
- Discuss formation of Training Subcommittee (August 2016)

GOAL – Data Submittals

Action Plan

- Support the ongoing process of NWPP staff development of the comprehensive narrative for the NERC Seasonal Assessment.
    - NWPP Staff to discuss Seasonal Assessments the first OC meeting following the assessment posting.
- Support NWPP Hourly Load development.
- Support correct reporting on NWPP area data.

GOAL – Review NWPP Membership Agreement

Action Plan

- Evaluate Operating Committee Section of the NWPP Membership Agreement for applicability of voting procedures and any other sections.
- Develop recommended revisions, if necessary.
- Support review of the committee structure and committee membership.

GOAL – OC to determine the disposition of Outage Coordination at the NWPP

Action Plan

- Determine disposition of the outage coordination process (August 2016)
- If retained, formal Outage Coordination Plan implementation (June 2017)