

1. Welcome, Call to Order

Jamie Austin, Production Cost Data Subcommittee (PCDS) Chair, called the meeting to order at 10:02 a.m. MT on September 28, 2022. A quorum was present to conduct business. A list of attendees is attached as Exhibit A.

2. Review WECC Antitrust Policy

Tyler Butikofer, System Adequacy Engineer, read aloud the WECC Antitrust Policy statement. The meeting agenda included a link to the posted policy.

3. Approve Agenda

Ms. Austin introduced the proposed meeting agenda.

On a motion by Chelsea Loomis, the PCDS approved the agenda.

4. Review and Approve Previous Meeting Minutes

Ms. Austin introduced the minutes from the meeting on August 10, 2022.

On a motion by Chelsea Loomis, the PCDS approved the minutes from August 10, 2022.

5. Review Previous Action Items

The PCDS did not review action items carried over from the PCDS meeting on September 14, 2022. Action items that are not closed and will be carried forward can be found [here](#).

6. 2032 Anchor Data Set (ADS) V2.0 vs. V2.1

Mr. Butikofer presented the 2032 Anchor Data Set (ADS) version 2.0 results in comparison to version 2.1. Hydro modeling and thermal retirement changes were made to Public Service Company of Colorado (PSCO). The Comisión Federal de Electricidad (CFE) resources confirmed that the power flow (PF) capacities should be used. The combined cycles were reduced to help serve the load. Concern was expressed about the no hydro spill outside of California and not all the capabilities being captured. Mr. Butikofer spoke with Balancing Authority of Northern California (BANC) about hydro spillage. BANC provided unit-level data. The ADS will be updated according to the data provided.

The presentation is posted to the [WECC website](#).

7. Assessment of the 2032 ADS PCM, V2.1

Mr. Butikofer presented the Locational Marginal Price (LMP) for ADS version 2.1. There were LMP spikes for Western Area Power Administration (WAUW) and El Paso Electric Company (EPE). The other areas did not spike enough to raise concern. WAUW's LMP spiked when weighted by generation. The simple average LMP did not show a spike. The case was sent to Hitachi to review. EPE's high LMP appears to be caused by congestion. EPE contains a nomogram with high congestion hours that correlates to the same hours as the high LMP's. The nomogram says the area load needs to be served by local generation. A new sensitivity is being run without the monitoring of the nomogram to see whether it corrects the issue. The PCDS discussed that using the verbiage of nomograms can cause confusion because the transmission nomograms have a different meaning. The PCDS will continue the nomogram discussion during a future meeting.

The presentation is posted to the [WECC website](#).

Jon Jensen, System Adequacy Engineer, presented path congestion differences between ADS version 2.0 and 2.1. The total congestion hours were similar between the two versions. Some paths decreased and some increased. The branch congestion is also similar. The GridView Python report would not run. Hitachi will need to assist with the issue.

The presentation is posted to the [WECC website](#).

Ms. Austin presented operational validations for version 2.1 ADS phase shifters, pump storage, and batteries. The PCDS discussed the importance of modeling phase shifters and ensuring that they are being represented correctly. The PF case is a static look at system dispatch, depicting a single-hour operation, and the Production Cost Model (PCM) models dynamics. The phase shifter owner needs to provide data on the range of phase angles and confirm they are represented correctly in the PCM.

Ms. Austin found 23 batteries that were modeled with one hour of storage, although, they are four-hour batteries (6.8 GW of capacity). This will affect dispatch and will need to be fixed.

Consideration should be given to improve the modeling of hybrid PV-BES, making sure their performance is optimized in the ADS. Modifications will need to be made to the way photovoltaic and batteries are modeled.

There will be a follow-up with Hitachi to see whether a minimum set phase shift angle can be added, and the 2023 missing battery storage will need to be fixed.

The presentation is posted to the [WECC website](#).



Kevin Harris, Pacific Northwest National Laboratory (PNNL), presented the generator dispatch spreadsheet. It contains the yearly summary from GridView for all the generators. The PCDS was encouraged to review it.

The presentation is posted to the [WECC website](#).

8. Export Hour of PF Case

Bharat Vyakaranam, PNNL presented modifications to the 2032 ADS PCM PF case. PNNL generated a solved PF case by removing 863 generators from the PF. The next steps will include correcting conversion issues and verify the mapping. This will allow the hours to be exported to the ADS.

9. Process Moving Forward

This topic was moved to a future meeting.

10. Public Comment

No comments were offered.

11. Review New Action Items

- Follow up with Hitachi about phase shifters and whether a minimum set phase shift time can be added.
 - Assigned To: Tyler Butikofer and Jamie Austin
 - Due Date: October 12, 2022
- Add the process moving forward to the first item on the October 12, 2022, PCDS agenda. (Parking lot list, ADS documentation, DDVM, etc.)
 - Assigned To: Tyler Butikofer and Jon Jensen
 - Due Date: October 12, 2022
- Fix the 2023 missing battery storage.
 - Assigned To: Tyler Butikofer and Jamie Austin
 - Due Date: October 19, 2022

12. Upcoming Meetings

October 5, 2022—ADS Lessons LearnedSalt Lake City, Utah

October 12, 2022.....Virtual

October 19, 2022.....Hybrid



13. Adjourn

Ms. Austin adjourned the meeting without objection at 11:33 a.m.



Exhibit A: Attendance List

Members in Attendance

Jamie Austin PacifiCorp
Kevin Harris Pacific Northwest National Laboratory
Anders Johnson.....Bonneville Power Administration—Transmission
John Liang..... Public Utility District No. 1 of Snohomish County
Chelsea LoomisWestern Power Pool (formerly Northwest Power Pool Corporation)
Hank McIntosh San Diego Gas and Electric
Effat Moussa..... San Diego Gas and Electric
Chifong Thomas Thomas Grid Advisor
Steven Wallace Comprehensive Power Solutions, LLC
Stan WilliamsBonneville Power Administration—Transmission

Members not in Attendance

Lee Alter..... Tucson Electric Power
Hazel Aragon California Energy Commission
Jose Diaz..... Los Angeles Department of Water and Power
Christopher Fecke-Stoudt..... Arizona Public Service Company
Jonathon Flores Los Angeles Department of Water and Power
Monica Garcia El Paso Electric Company
Manuel Gomez..... El Paso Electric Company
Michael Granados..... Los Angeles Department of Water and Power
Chris Hagman..... American Transmission Company
Bill Hosie..... PSI Power System Innovation Corp.
Eliana IbarraImperial Irrigation District
Tito Inga-Rojas British Columbia Hydro and Power Authority
Harris LeeSalt River Project
Amy Li..... Southern California Edison Company
Peter Mackin..... GridBright, Inc.



Akhil Mandadi..... Arizona Public Service Company
John D. Martinsen..... Public Utility District No. 1 of Snohomish County
Kimberly McClaffertyNorthWestern Energy
Ahlmahz Negash Tacoma Power
Daniel Ramirez..... Energy Strategies
Matthew StajcarNorthWestern Energy
Sirisha TanneeruPublic Service Company of Colorado (Xcel Energy)
Emily TozierSalt River Project
Xiaobo Wang.....California Independent System Operator
Di Xiao..... Southern California Edison Company
Yi Zhang.....California Independent System Operator

Others in Attendance

Tyler ButikoferWECC
Arkadeep Das.....WECC
Gilbert Flores.....Xcel Energy
Jon Jensen.....WECC
Richard Jensen..... California Energy Commission
Nicole LeeWECC
Katie RogersWECC
Jan Strck San Diego Gas and Electric
Alyssa Tarvares..... California Energy Commission
Bharat Vyakaranam..... Pacific Northwest National Laboratory
Byron WoertzWECC

