## Welcome, Call to Order

Philip Augustin, Studies Subcommittee (StS) Chair, called the meeting to order at 1:00 p.m. MT on February 27, 2023. A quorum was present to conduct business. A list of attendees is attached as Exhibit A.

## Review WECC Antitrust Policy

Jon Jensen, Reliability Modeling Engineer, read aloud the WECC Antitrust Policy statement. The meeting agenda included a link to the posted policy.

## Approve Agenda

Mr. Augustin introduced the proposed meeting agenda.

Doug Tucker, Reliability Assessment Engineer, added the annual progress report to the StS agenda.

**On a motion by David Le, the StS approved the agenda.**

## Review and Approve Previous Meeting Minutes

Mr. Augustin introduced the minutes from the meeting on November 14, 2022.

**On a motion by Peter Mackin, the StS approved the minutes from November 14, 2022.**

## Review Previous Action Items

Mr. Jensen reviewed action items carried over from the **StS** meeting on November 14, 2022. Action items that are not closed and will be carried forward can be found [here.](https://www.wecc.org/Administrative/StS%20Action%20Items.pdf)

## StS Charter Approval item

Mr. Augustin introduced the new StS Charter.

**On a motion by Philip Augustin, the StS Charter was approved.**

The charter is posted on the WECC [website](https://www.wecc.org/Administrative/StS%20Charter_2023_Final.pdf).

## GMD Assessment Update

Mr. Tucker presented the Geomagnetic Disturbance (GMD) Assessment update.

 *Approval item: GMD Assessment Version 6 Results*

**On a motion by Doug Tucker, the StS approved the GMD Assessment Version 6.**

The GMD Assessment is posted on the WECC [website.](https://www.wecc.org/Administrative/TuckerD-StS-GMD%20Assessment_February%202023.pdf)

## Long-Duration Energy Storage (LDES) Assessment Presentation

Bhavana Katyal, Reliability Modeling Engineer, presented the Long-Duration Energy Storage (LDES) Assessment. Ms. Katyal’s recommendations included improvements to the future modeling, seasonal storage, and flexible load, and studying extreme natural events. The modeling improvements consisted of obtaining additional tools to study long-term charging duration for energy storage, seasonal storage, and flexible load that can ease the challenges of spillage and reduction of infrastructure with load renewables.

The presentation is posted on the WECC [website](https://www.wecc.org/Administrative/KatyalB-LDES%20Update_Februrary%202023.pdf).

## 2023 Study Program Update—WECC

Tyler Butikofer, Reliability Assessment Engineer, discussed how the Year 10 Extreme Cold Event study focused on production cost modeling. This included researching data for a cold weather event. Mr. Butikofer stated this is in the research and data collection phase. The next meeting for this group is on March 15, 2023.

Ms. Katyal gave an update on the Year 20 Extreme Heat/LDES Event study. Ms. Katyal stated that the 2022 Scenarios have been created based on projected targets. Ms. Katyal has some PNNL leads and will follow up on them in the next few weeks. The next meeting for this group is on March 8, 2023.

Mr. Jensen gave a presentation on the Year 20 Extreme Cold/LDES Event study. Mr. Jensen is working with PNNL on the data being used for this study. Mr. Jensen discussed the approach for several studies to start a main foundation case. Mr. Jensen discussed the timeline for the study and when the final report should be available, which is November 2023.

Katie Rogers, Reliability Assessment Engineer, gave an update on the Year 20 Compound Load Impacts study. The advisory group met to discuss the timeline and how it affects the foundational case. The group is looking at running the 20 Year as a zonal model.

Mr. Tucker gave a presentation on the Grid-Forming Inverters study. This group is using the grid-forming technology that can respond to a grid-forming event. Mr. Tucker commented that the light spring scenarios case will be reviewed and they will be looking at a low level of this case.

Tyson Niemann, Reliability Modeling Engineer, gave an update on the Changes in Grid Strength study. Mr. Niemann discussed the use of short circuit cases annually for four major utilities. They are NorthWestern Energy, PacifiCorp, Tri-State Generation and Transmission, and Southern California Edison. Mr. Niemann has volunteers from each of these utilities working on recommendations for which generators will be replaced with inverter-based resources.

The presentation is posted on the WECC [website.](https://www.wecc.org/Administrative/JensenJ-Yr20ColdUpdate_February%202023.pdf)

The presentation is posted on the WECC [website](https://www.wecc.org/Administrative/TuckerD-StS-%20GFMIAG%20Assessment_February%202023.pdf).

## UFLSWG Update

Robby Anderst, Puget Sound Energy, Inc., discussed the Underfrequency Load Shedding Work Group (UFLSWG) assessments for Fall 2022. The UFLSWG is on a two-year cycle and not working on assessments right now. This group will be working on approving its charter and methods. Mr. Anderst commented that the UFLSWG will be working on simulations for the summer 2023. These simulations will be run by the utilities rather than WECC. The Reliability Assessment Committee (RAC) will send out a survey to see who would like to help with these studies.

## Public Comment

Ken Wilson, Western Resource Advocates, commented that the Study Program team leads are running excellent meetings and getting great participation from the members.

## Review New Action Items

There were no new action items.

## Upcoming Meetings

April 24, 2023, 1:00–5:00 p.m. MT Virtual

June 19, 2023, 1:00–5:00 p.m. MT Virtual

August 21, 2023, 1:00–5:00 p.m. MT Virtual

October 16, 2023, 1:00–5:00 p.m. MT Virtual

## Adjourn

Mr. Augustin adjourned the meeting without objection at 2:50 p.m.

## **Exhibit A: Attendance List**

### Members in Attendance

Robby Anderst Puget Sound Energy, Inc.

Brenna Andrews NorthWestern Energy

Philip Augustin Salt River Project

Scott Beyer Western Power Pool (formerly Northwest Power Pool Corporation)

Ken Che Public Utility District No. 1 of Snohomish County

Tuan Dang Public Utility District No. 1 of Snohomish County

Talal Hanna San Diego Gas and Electric

Jeff Hanson Colorado Springs Utilities

Fred Heutte NW Energy Coalition

Jon Jensen WECC

Lesley Kayser-Sprouse Hetch Hetchy Water and Power

Michael Korhonen Western Area Power Administration

David Le California Independent System Operator

Todd Lichtas Tucson Electric Power

Peter Mackin GridBright, Inc.

Karen Reedy Public Service Company of New Mexico

Faranak Sarbaz Los Angeles Department of Water and Power

Spencer Tacke Auriga Corporation

Chifong Thomas Thomas Grid Advisor

Xiaofei (Sophie) Xu Pacific Gas and Electric Company

### Members not in Attendance

Nayeem Mohammad Abdullah Metropolitan Water District of Southern California

Waseem Arif FortisBC, Inc.

Ian Beil Portland General Electric Company

Aseem Bhatia California Department of Water Resources

Benjamin Borowiak Arizona Electric Power Cooperative, Inc. (Arizona G&T Cooperatives)

Ron Calvert Utility System Efficiencies, Inc.

Shawn Carlson Basin Electric Power Cooperative

Thomas Carr Western Interstate Energy Board

David Cathcart Bonneville Power Administration—Transmission

Desmond Chan Seattle City Light

Tom Christensen Basin Electric Power Cooperative

Patrick Corrigan Public Service Company of Colorado (Xcel Energy)

Thomas Duane Public Service Company of New Mexico

Jonathon Flores Los Angeles Department of Water and Power

Thomas Flynn California Energy Commission

Alex Fratkin NV Energy

Jennifer Galaway Portland General Electric Company

Chris Gilden Tri-State Generation and Transmission—Reliability

Kody Heppner Turlock Irrigation District

Bryant Hicks Salt River Project

Bill Hosie PSI Power System Innovation Corp.

Robert Jackson Burns & McDonnell (1898 and Co.)

Daniel Johnson Jr. Black Hills Corporation

Christopher Kulink Portland General Electric Company

May Le Public Utility District No. 2 of Grant County

Chelsea Loomis Western Power Pool (formerly Northwest Power Pool Corporation)

Richard Maguire Public Utility District No. 2 of Grant County

Jake Maxfield PacifiCorp

Daniel McGuire Salt River Project

Pete Mensonides Turlock Irrigation District

Mitchell Miller NorthWestern Energy

Patrick MontPlaisir Western Area Power Administration

Valeriy Jr. Oleshko Western Area Power Administration

Eepsita Priye Puget Sound Energy, Inc.

Ebrahim Rahimi California Independent System Operator

Dipendra Rai British Columbia Hydro and Power Authority

Daniel Ramirez Energy Strategies

Benjamin Rodriguez El Paso Electric Company

Erik Schellenberg Idaho Power Company

Masoud Shafa California Department of Water Resources

Alejandro Solis El Paso Electric Company

Amy Sopinka British Columbia Ministry of Energy and Mines

April Spacek Avista Corporation

Jan Strack San Diego Gas and Electric

Angela Tanghetti California Energy Commission

Khanh Thai Tacoma Power

David Tovar El Paso Electric Company

Patrick Truong Sacramento Municipal Utility District

Louis Vigil El Paso Electric Company

Curtis Westhoff Idaho Power Company

Di Xiao Southern California Edison Company

Dennis Yegorov PacifiCorp

Cole Youngers Avista Corporation

Janice Zewe Sacramento Municipal Utility District

Kevin Zhang British Columbia Hydro and Power Authority

Wenjuan (Wendy) Zhang Pacific Gas and Electric Company

### Others in Attendance

Layne Brown WECC

Tyler Butifoker WECC

Dennis Chesnakov Public Utility District No.2 of Grant County

Alexis Cortez Sacramento Agency of Northern California

Donna Enriquez El Paso Electric Company

Gerald Harris Quantum Planning Group

manseur Hasovic Western Area Power Administration

Mark Hesters California Energy Commission

Bhavana Katysl WECC

Richard Marrs Quantum Planning Group

C.D. Mclean California Energy Commission

Nima Miri Seattle City Light

Tyson Niemann WECC

Anthony Rendon Salt River Project

Katie Rogers WECC

Trevor Rombough Black Hills Corporation

Vijay Satyal WPA

Marie Smith WECC

Douglas Tucker WECC

Ken Wilson Western Resources