

WIRAB Monthly Meeting

December 2, 2021



Outline



- **WECC Activities**
 - WECC Update
 - WECC Study Program Results: Changes in System Inertia
- **WIRAB Activities**
 - WIRAB Accomplishments in 2021
 - WIRAB 2022 Strategic Initiatives
- **Upcoming WIRAB Meetings**



WIRAB Update

December 3, 2021

Steve Goodwill
SVP Strategic Engagement,
General Counsel, & Secretary

Western Assessment of Resource Adequacy

- Western Assessment will be published in conjunction with the NERC LTRA in mid-December
- Probabilistic analysis of resource adequacy in the west over the next 10 years
 - Examines every hour of the next ten years, not just the peak hours
 - Analyzes the planning reserve margin needed to maintain 99.98% reliability
- New this year: deterministic analysis of 2 scenarios:
 - High demand (heatwave conditions)
 - High demand + localized drought (no generation from Glen Canyon and Hoover Dams)



Western Assessment High Level Conclusions

- Based on current resource and load projections, variability will increase over the next 10 years
- Resource adequacy approaches need to evolve and adapt to better account for increasing variability
- Under current Planning Reserve Margins (PRM), all subregions show resource adequacy risks in the next 10 years
 - By 2025, given current projections and accounting for imports, all 5 subregions have hours where there is a risk that demand will not be met
- PRMs need to be increased, or other actions taken, to reduce the probability that demand exceeds resource availability

Board of Directors

- Next meetings:
 - Associated meetings on December 7.
 - Board of Directors meeting on December 8.
- Register on [WECC.org/calendar](https://www.wecc.org/calendar).





Contact:

Steve Goodwill

SVP Strategic Engagement, General
Counsel, & Secretary

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Changes in System Inertia

December 2, 2021

Enoch Davies

Manager, System Stability

Changes in System Inertia

Purpose

- Frequency response under low inertia

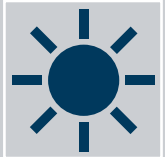
Reliability Questions

- Minimum inertia needed to prevent UFLS
- Other reliability issues

Cases Studied



SITF low inertia case (Hour 1400 on August 4, 2028)



2021 Heavy Summer (Hour 1500)



2020 Light Spring (Hour 0300)

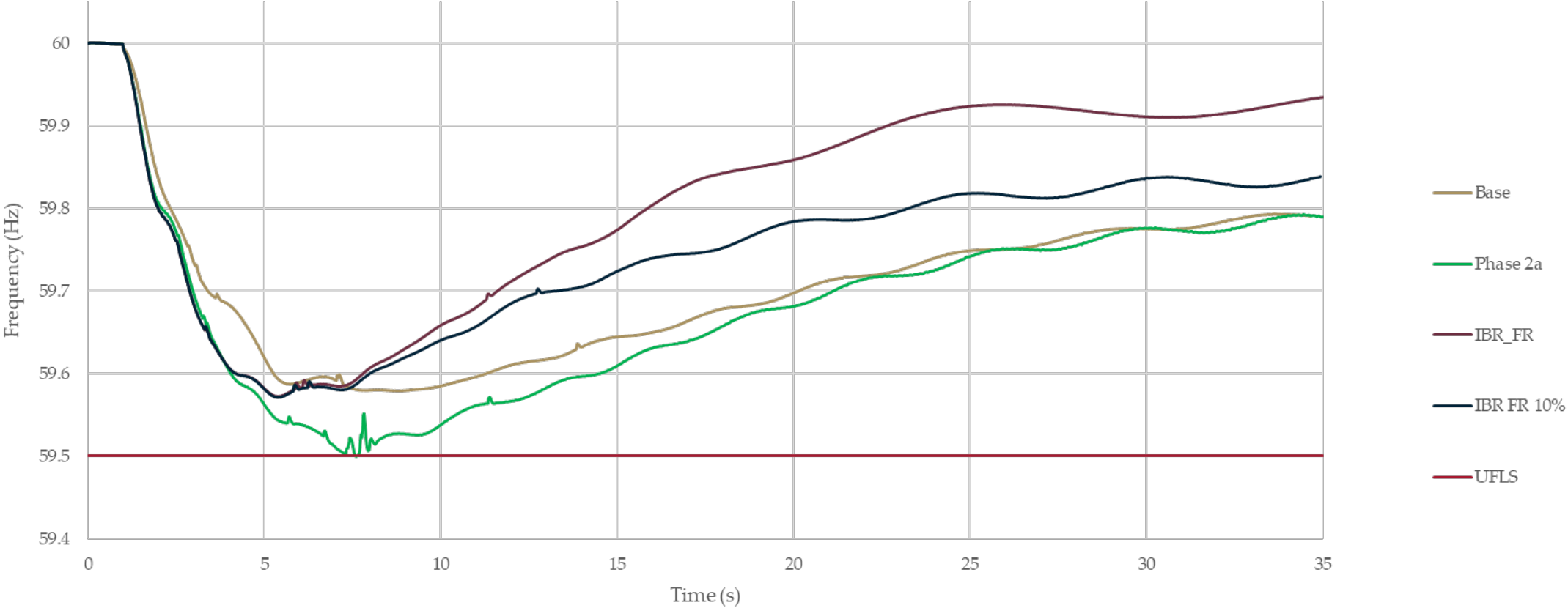
Study Methods

Replaced synchronous generators with IBRs

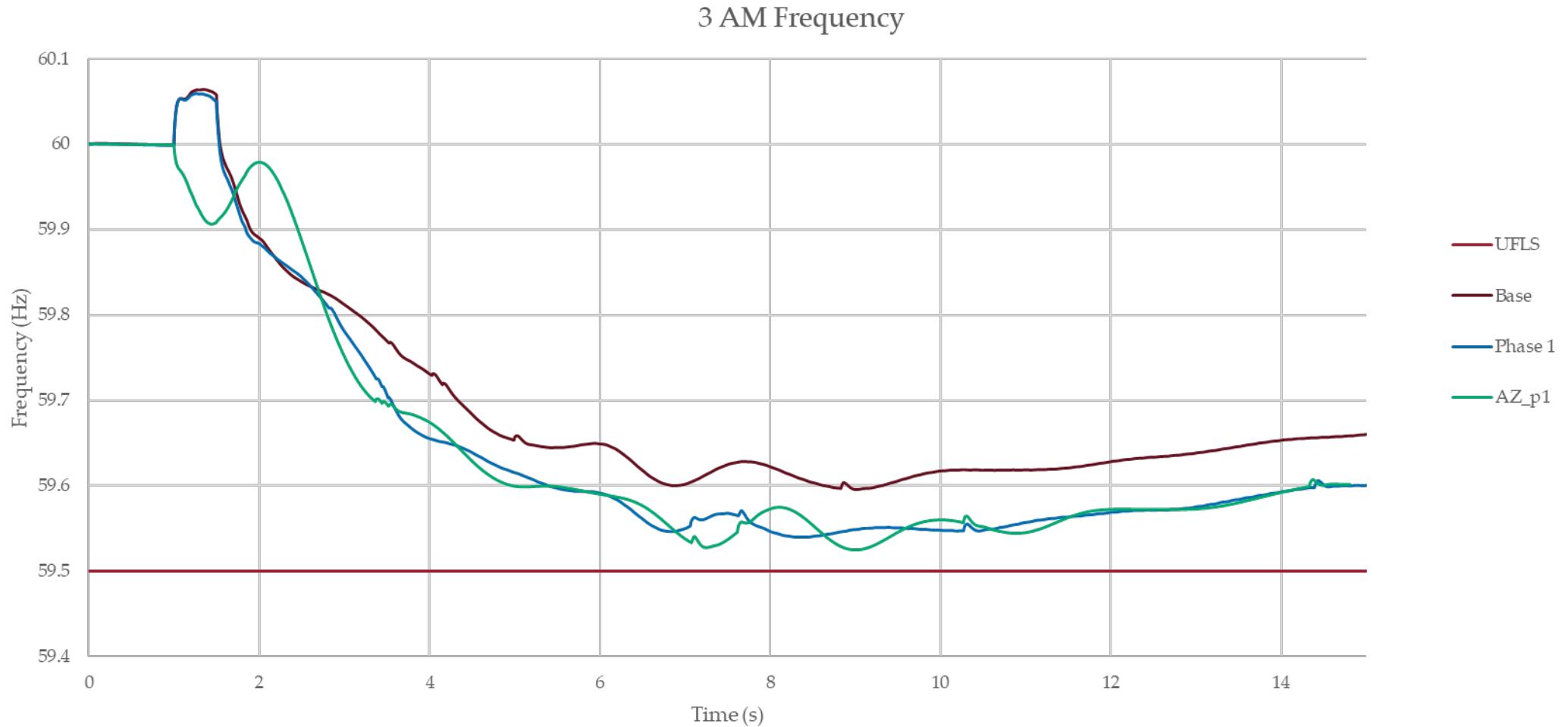
Applied Double Palo Verde contingency

Monitored frequency nadir at Malin 500 kV bus

3AM Case with IBR Frequency Response



3AM Loss of PDCI and 2850 MW



Recommendations



Monitor inertia



Rate of change of
frequency



Modeling
improvements



Voltage stability

Executive Summary

CHANGES TO SYSTEM INERTIA
Executive Summary

Finding #1
Under light load system conditions and low inertia, a standard generation disturbance could potentially initiate load shedding due to low system frequency

Finding #2
The rate at which system frequency declines during generation disturbances is increasing due to reduced system inertia

Finding #3
Localized voltage instability was seen due to reduced levels of conventional generators

How much system inertia is needed for the reliability of the Western Interconnection?

WECC recommends that entities involved with system planning and operations closely monitor system inertia under all conditions and address any potential reliability issues.

WHAT IS SYSTEM INERTIA?

In power systems, inertia is the energy stored in large rotating generators and some industrial motors, which tend to remain rotating. This stored energy could be particularly valuable if a large power plant were to fail, since it can temporarily make up for the power lost from a generator fails.

WHY DOES THIS MATTER?

System inertia matters because the Western Interconnection is experiencing a shift from conventional resources to wind and solar generation resources, which do not inherently provide inertia to the system. This could result in system instability or loss of load under certain conditions.

Read the report Hear the podcast

WECC



Contact:

Enoch Davies

Manager, System Stability

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WIRAB 2021 Accomplishments



Resource Adequacy:

- Effectively encouraged WECC to improve its assessment of long-term resource adequacy in the West
- Participated in FERC's Technical Conference on Resource Adequacy in the West
- Engaged in the efforts to stand up the Western Resource Adequacy Program and advised on the governance on the program

Dynamic Line Ratings:

- Explored the barriers to DLR in the West
- Engaged at FERC highlighting the importance of Network Optimization before Reinforcement and Expansion (NORE)

WIRAB 2021 Accomplishments



Reliability Assessments:

- Engaged with WECC and advised the studies on:
 - Changes in System Inertia Study
 - Distributed Energy Resource Study
 - Resilience Study
 - Variable Energy Resource Study

Reliability Coordinator Activities:

- Successfully encouraged CAISO RC West and SPP West RC to implement metrics measuring effectiveness of RC operations

WIRAB 2022 Initiatives



- [Initiative 1](#): Advise WECC to improve regional coordination and information sharing to mitigate risks associated with wildfires and the impacts on and from the bulk electric system in the Western Interconnection.
- [Initiative 2](#): Advise WECC to conduct a reliability assessment, identifying the services and capabilities that long-duration energy storage could provide to support ongoing system reliability in the Western Interconnection.

WIRAB 2022 Initiatives



- [Initiative 3](#): Advise WECC to produce a preliminary summary of grid-forming inverter technology and its potential to support the stable operation of the Western Interconnection.
- [Initiative 4](#): Advise WECC to continue to improve its “Western Assessment of Resource Adequacy” and to complement this planning work with additional education and outreach on how resource adequacy problems impact real-time system operations.

Upcoming Meetings



WIRAB Monthly Teleconference Meeting

First Thursday of every month at 11:00 AM MT
Next Meeting: January 6, 2022 at 11:00 AM MT

Spring 2022 Joint CREPC-WIRAB Meeting

To Be Announced

<https://westernenergyboard.org/>

Thank You!

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