

## 2020-2021 Study Program Assessment Name

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### Assessment Introduction and Purpose:

Create a Western Interconnection low inertia case to determine the system breaking points to discover the limits of system reliability. System wide (WECC base case creation contingencies) and major local (BA) contingencies will be examined. If problems are found migration measure will be explored.

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### Key Reliability Questions:

1. What is the minimum amount of inertia required for the western interconnection to prevent a large generation outage from getting to under frequency load shedding?
2. Will corners of WECC experience weak grid issues that have been observed in Texas (ERCOT), Australia (AEMO), and Europe (EirGrid)? -- These problems are not just frequency response but a mix of issues including small-signal stability, weak grid stability and grid brittleness. Stress the system to its breaking point to discover the limits of system reliability.
3. Identify Issues associated with low inertia (i.e., high IBR)?
4. How might transmission constraints emerge during the transformation of the system and identify urgently needed efforts to relieve congestion to maintain system reliability?

## 2020-2021 Study Program Assessment Scope

5. SITF-Studying dynamics where frequency response and voltage regulation capability is turned on for all IBR; (assumption)
6. Integrate Utility scale and DER scale Storage as needed (assumption)
  - Responses to storage to frequency events

### Reliability Risk Priorities:

The Reliability Risk Priorities are:

- Resource adequacy and performance,
- Changing resource mix,

### Assessment Requirements:

(What Tools, Models, Data are required to accomplish this study?)

- **Tools** – GridView and PSLF
- **Models** – PCM, Power Flow and Short Circuit
- **Data** – Modify 2024LSP1sa powerflow, (2028) 2030 ADS PCM (light spring or fall hour)

### Study outline:

- PCM
  - Start with 2030 ADS PCM (contingent on the Round Trip functionality)
  - Retire Coal and if necessary Natural Gas Resource– John Doe (12/31/20)
  - Add in additional resources to PCM– John Doe (1/5/2020-2/28/2021)
  - Identify IBR/synchronous generation ratio – (3/1/2021- 3/7/2021)
  - Select a maximum of two hours for further study and export from PCM to Power Flow - (3/8/21 – 3/15/2021)
- Power Flow
  - Solve hour – John Doe (3/16/2021-4/1/2021)
  - Check Voltage and check good initial conditions (4/1/21 -4/15/2021)
- Dynamics
  - Create Master Dynamics file for case– John Doe (4/15/2020-5/5/2021)
  - Run the WECC standard and additional Disturbances– John Doe (5/6/2020-7/5/2021)
- Analysis and Report
  - Analyze the study– John Doe (7/6/2020-9/5/2021)
  - Create study report– John Doe (9/6/2020-10/5/2021))

### Timeframe of Study:

Timeframe for this study will be 2030



### Reporting Metrics:

(Describe what reporting metrics you are going to use for this assessment to address the purpose of the study (e.g., UFLS, UVLS, Resource Adequacy, fault current, unserved energy, cascading outages, Transmission congestion).)

