Large Electronic Load (LEL) Modeling Approach and DWG Survey Document Update

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LEL Modeling Challenge

1. **Accurate Models for Reliable System Assessment**

   - Appropriate and accurate models are essential for ensuring reliable system assessments and minimizing unnecessary sensitivity studies

2. **Limitations in Existing Standard Models**

   - The current CMLD standard model does not accurately represent power-electronic load behavior like data centers

   - A standard library model for LEL representation is not yet available

3. **New Standard Model Still Uncertain**

   - PTI is developing a new standard model for PSSE Version 36,but its release date is still unknown. It is expected in 2026

LEL Modeling Challenge

4. DWG Transitioning to PSS/E 36
   - DWG will transition to PSSE Version 36 in June 2026
   - The 2026/2027 DWG Flat Start Case will be developed and posted in Version 36
5. UDM Is the Most Mature Option Today
   - The latest version 4 of the UDM model developed based on EPRI EV model includes momentary-cessation logic, reconnection settings with time delays. It is considered mature and adequate for representing the power-electronic portion of LEL
   - Model along with parameter description is available in PSS/E version 35
   - However, the cooling portion can continue to be modeled using CMLD if cannot be represented using EPRI UDM

   Note
   - The UDM and its associated documentation are not included in the PSSE v35 model library, as it is not a library model. They will be made available on the NERC LMWG website (link: https://dev.azure.com/nerc/_git/LMWG_Resources?path=/Data_Center_Model_PERC1)
   - Availability of the PSSE v36 version of this UDM is still to be determined.

LEL Modeling Approach

❑ Interim Approach
- The DWG LL survey document has been updated to make it easier to extract model parameters from the survey responses
- The following interim LEL model representation will apply if the standard model is insufficient to represent LEL:
  - Split a single LEL into the following two components:
    1) CMLD – represents the cooling portion if can't be represented using EPRI UDM
    2) EPRI UDM – represents the power-electronic portion
       Example: LEL Load ID = 1 has 30% Cooling, 70% PEL, then
       Step 1: Split ID 1 into L1 and L2
       Step 2: Model L1 (cooling) using CMLD or EPRI UDM, L2 (PEL) using EPRI UDM

❑ <u>Timeline</u> for the interim approach
- LEL Projects About to Begin Stability Studies
  - Interim LEL model data must be submitted starting January 5, 2026
- LEL Projects with Completed Stability Studies Entering LL QSA
  - Interim LEL model data must be submitted prior to May 1, 2026 or earlier)
- LEL Projects Completed LL QSA, Prior to Energization
  - Interim LEL model data must be submitted no later than July 1, 2026. This aligns with the energization timeline associated with the February 1 QSA
- LEL in operation
  - DWG will further discuss reasonable approach at the future DWG to allow updates to be implemented over time

LEL Modeling Approach (Continued)

- ❑ Long-term approach: If available and usable, transition to PSSE standard library in v36 or other UDM accurately representing the LEL dynamic characteristics

- ❑ If DWG is desired, ERCOT can also organize a session for the UDM development

Questions

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