

Next Steps in Load Modeling

WECC Modeling Workshop
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Next Steps in Load Modeling

Loads will play a greater role in Bulk Power System stability

- Changing electrical end-uses

- Distributed Energy Resources and Energy Storage

- Historic demarcation lines between Transmission and Distribution blur in many regions

Our understanding of load model components and data are also improving

- Better models for power electronic drives and single-phase motors

- On-going improvements in load composition analysis and data

Load modeling efforts are expected to continue

- Near Term – data improvements within the existing model structure

- Longer Term – modular, flexible and scalable model structure

What is Needed to Implement a Load Model

Model Structure

Existing CMLD is tested, verified, benchmarked among software platforms

Future model structure needs to be modular, scalable and flexible

Model Data

(i) Distribution equivalent, (ii) Load composition, (iii) Load component data

Model Data Management

NERC Load Model Data Tool

Load Type versus Load Bus records

System Impact and Model Validation Studies

Structures and processes for performing validation studies and addressing any study issues

Near-Term Improvements

Existing CMLD model structure

Model Data

- Voltage vs time motor stalling for Motor D

- Update load composition data for WECC

- Improvements in motor protection and control data

Model Data Management

- “Load Type” records

- Adoption of NERC Load Model Data Tool

Long-Term Improvements

Model Structure

Modular, scalable and flexible model structure (plug and play principle)

Model Components

Three-phase motor model improvements

Single-phase phasor model implementation

Power Electronic Drive (VFD and ECM) models

Protection and control models with progressive tripping

EV charging stations

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Long-Term Improvements

Model Data

- Load composition data improvements – ability to scale from regional to substation-specific

- Control and protection data improvements

Model Data Management

- Keep up NERC Load Model Data Tool up to date

System Impact and Model Validation Studies

- Promote deployment of disturbance monitoring equipment

- Support validation studies

- Conduct system impact studies whenever model revisions are made

Thank You