NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Adoption of EMT Modeling

North American EMT Strategy to Support Bulk Power System Reliability

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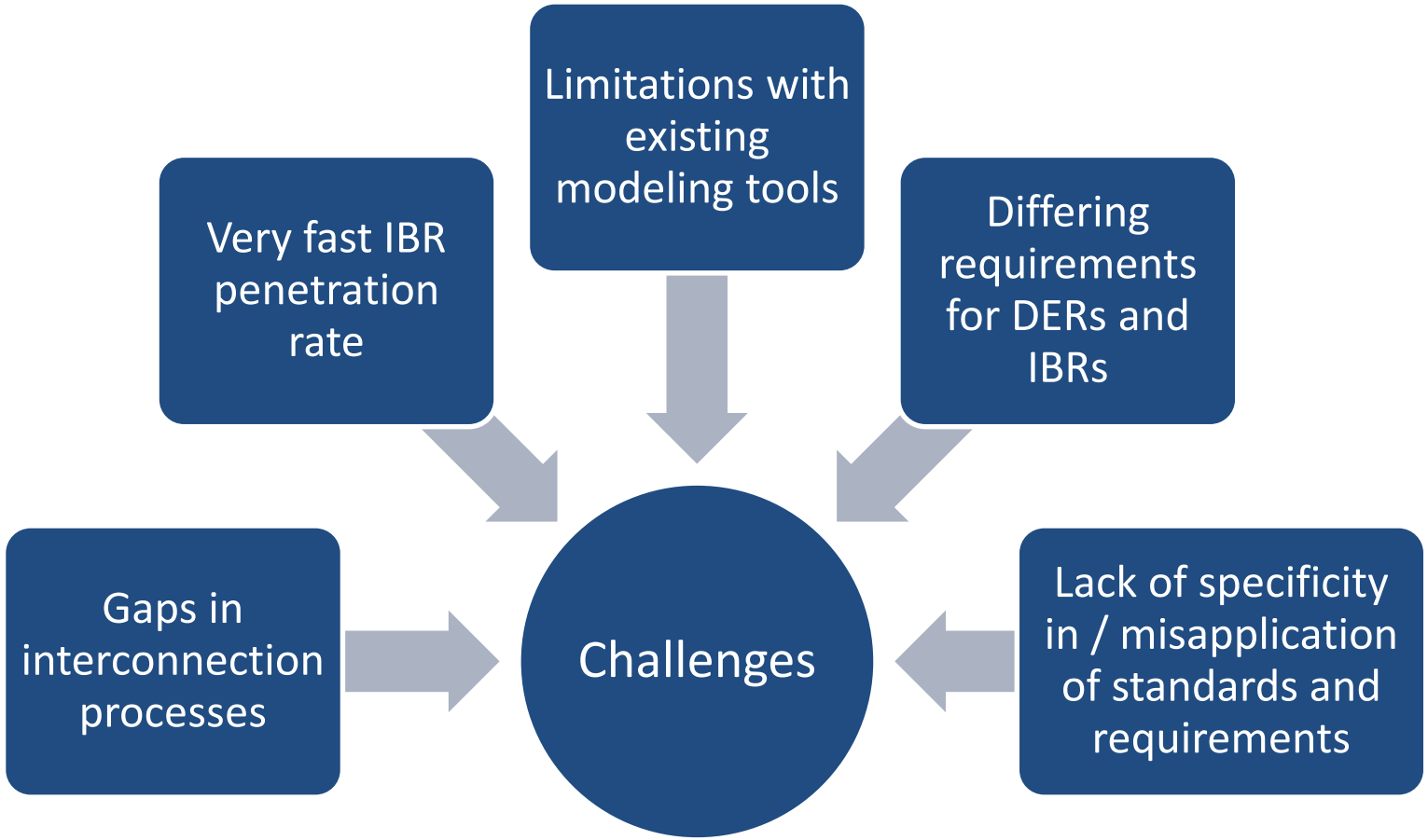
Reliability Challenges

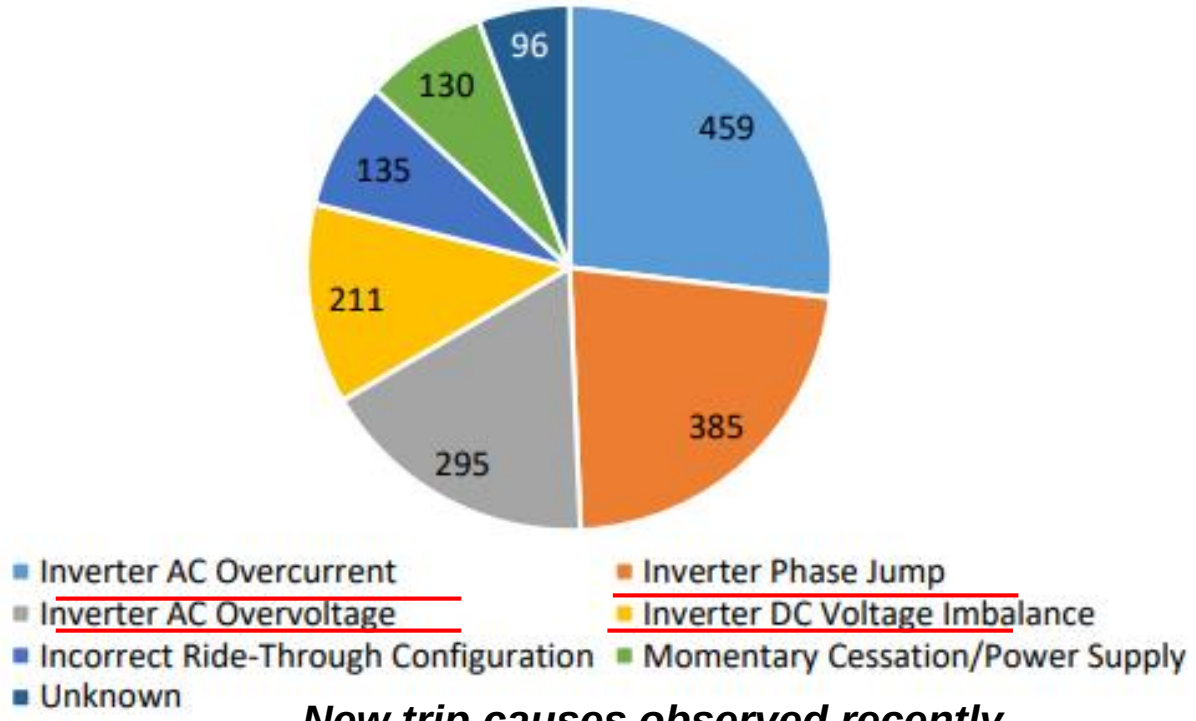


Reality of (most) IBR Plant Models

What was studied

What was installed

Odessa Example – Causes of Inadvertent Tripping



New trip causes observed recently

- *Unbalanced AC current tripping*
- *DC bus overvoltage tripping*

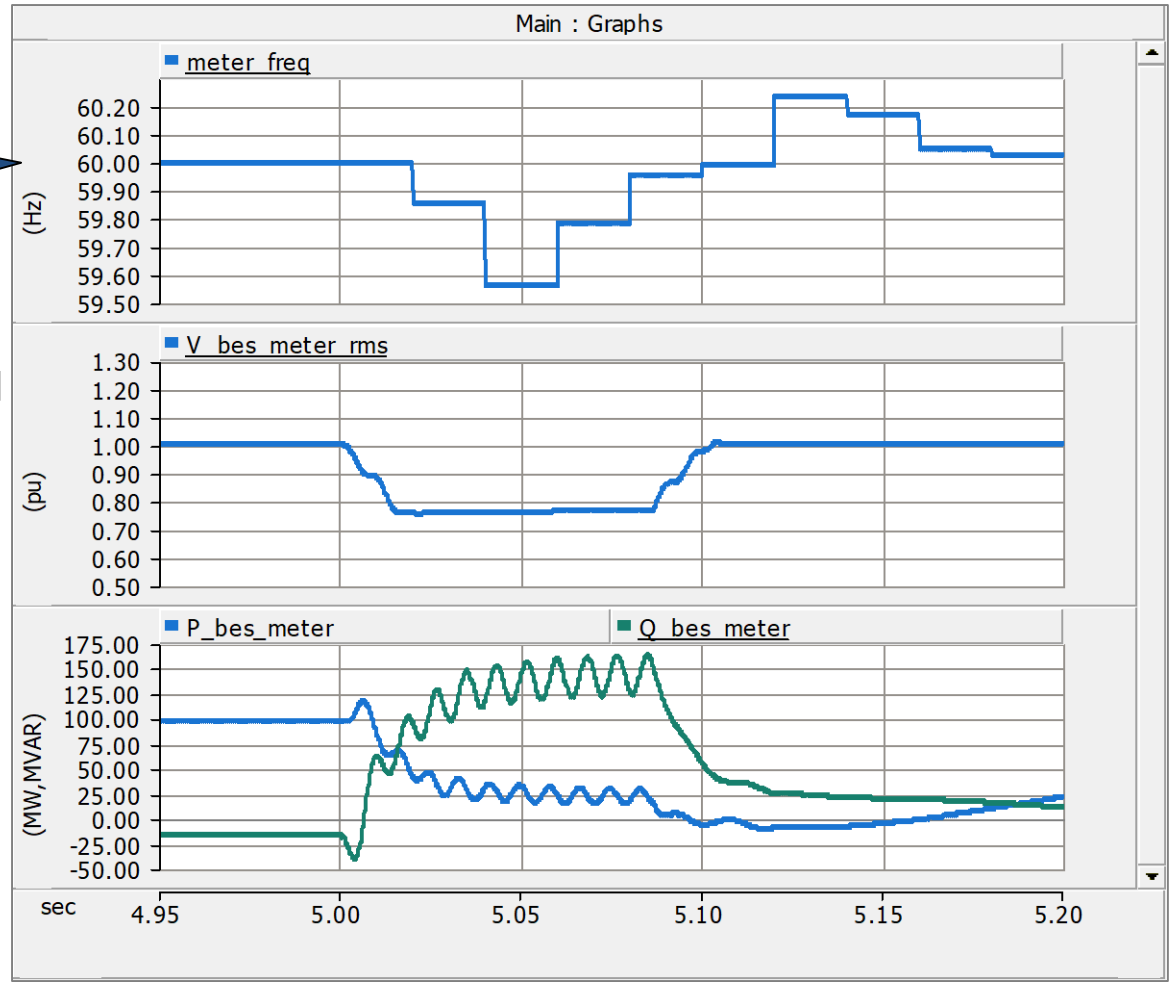
https://www.nerc.com/comm/RSTC_Reliability_Guidelines/NERC_2022_Odessa_Disturbance_Report%20(1).pdf

Modeling Limitations

We can't avoid what we can't see

Typical solution of positive sequence dynamic simulations

Risks Undetected



System Outlook

- Prepare for IBR-dominated Future – Learn EMT Modeling
  - System Strength
  - Damping
  - System Protection

EMT Strategy

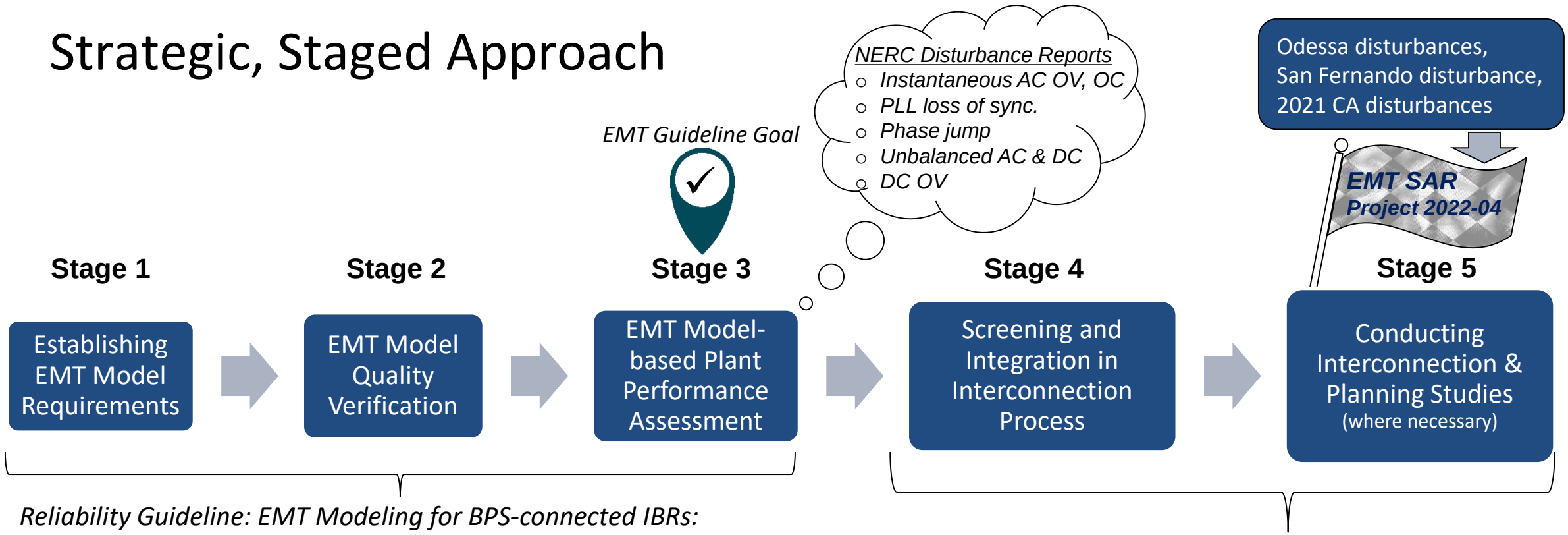
- End Goal
  - Widespread adoption of EMT modeling tool in interconnection and planning studies
    - The use of the EMT tool is not limited to interconnection and planning studies although it is where our focus is, at the moment. Other uses include system protection studies, event analysis, and operation studies

EMT Strategy

- Approach
  - Make EMT modeling more accessible and approachable
  - Create common understanding
  - Promote motivation
  - Decouple from other processes
  - Create a baseline, unified approach
  - Provide educational resources

EMT Modeling Adoption

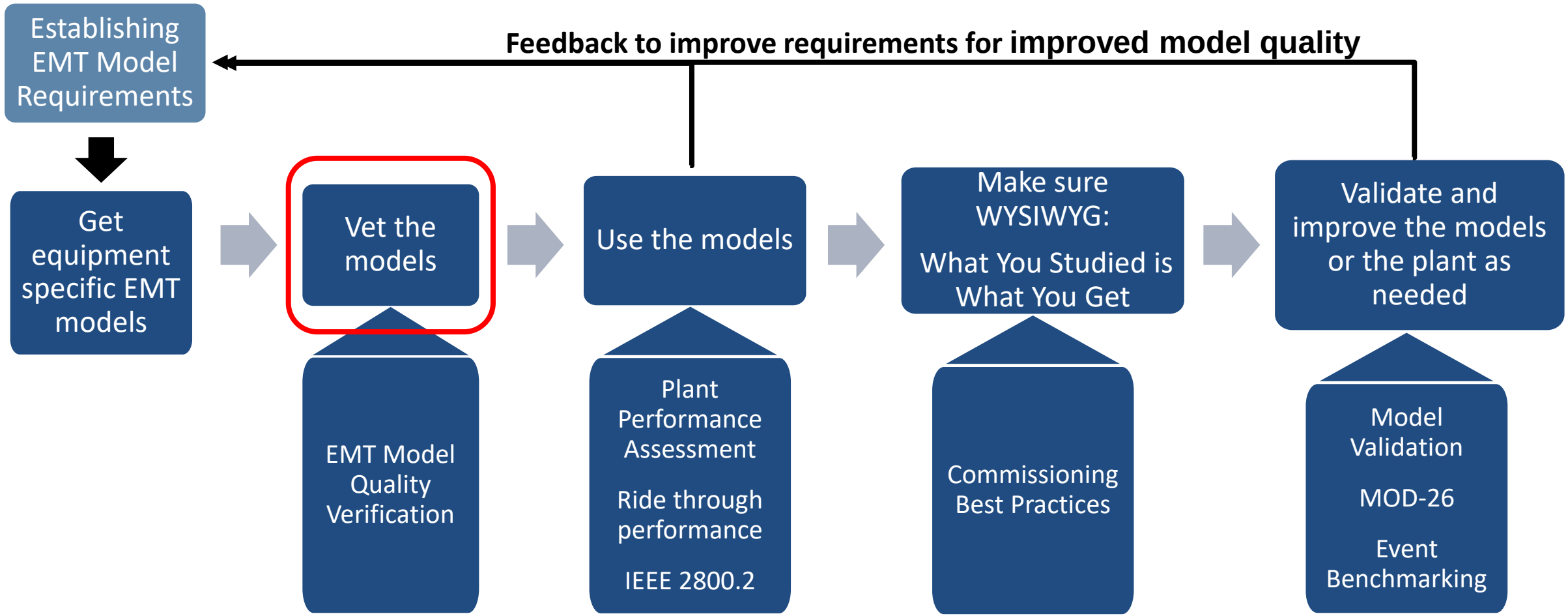
Strategic, Staged Approach



Reliability Guideline: EMT Modeling for BPS-connected IBRs: Recommended Model Requirements and Model Quality Verification

Draft Reliability Guideline: Recommended Practices for Performing EMT System Studies for Inverter-Based Resources

EMT Model Lifecycle



Questions and Answers