

EMT Modeling Guidelines, Applicable Standards and Resources

2026 ESIG Spring Technical Workshop

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NERC-Industry Collaboration



NERC EMTWG
EMT Modeling Working Group

- Best Practices
- Guidelines
- Outreach

NERC-ORNL-DOE-Industry

- Efficiency
- Accuracy
- Expertise

NERC EMT Modeling Working Group (EMTWG)

Support and accelerate industry adoption of EMT modeling and simulation in the interconnection and planning studies

Best Practices Guidance

- White Papers
- Technical Reference Documents

Recommended Practices

- Reliability Guidelines

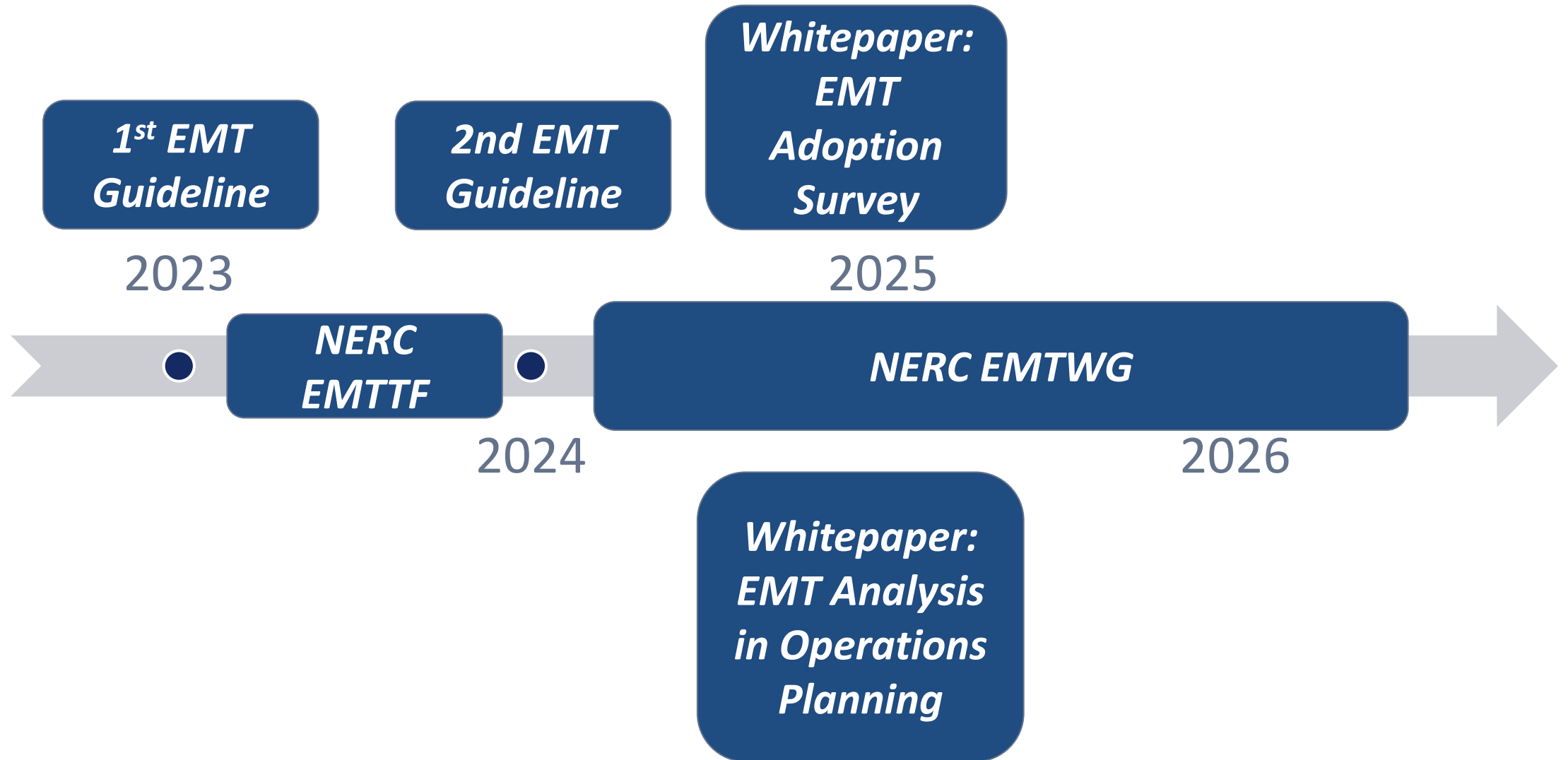
Resources

- Suggested Reading List
- Technical Presentations

Outreach and Education

- Workshops
- Webinars

Progress



EMT Adoption Survey Summary

Challenges

- Expertise and Resource Constraints
- Complexity of Models and Large System Studies
- Keeping up with Technological Changes
- Model Data Sharing

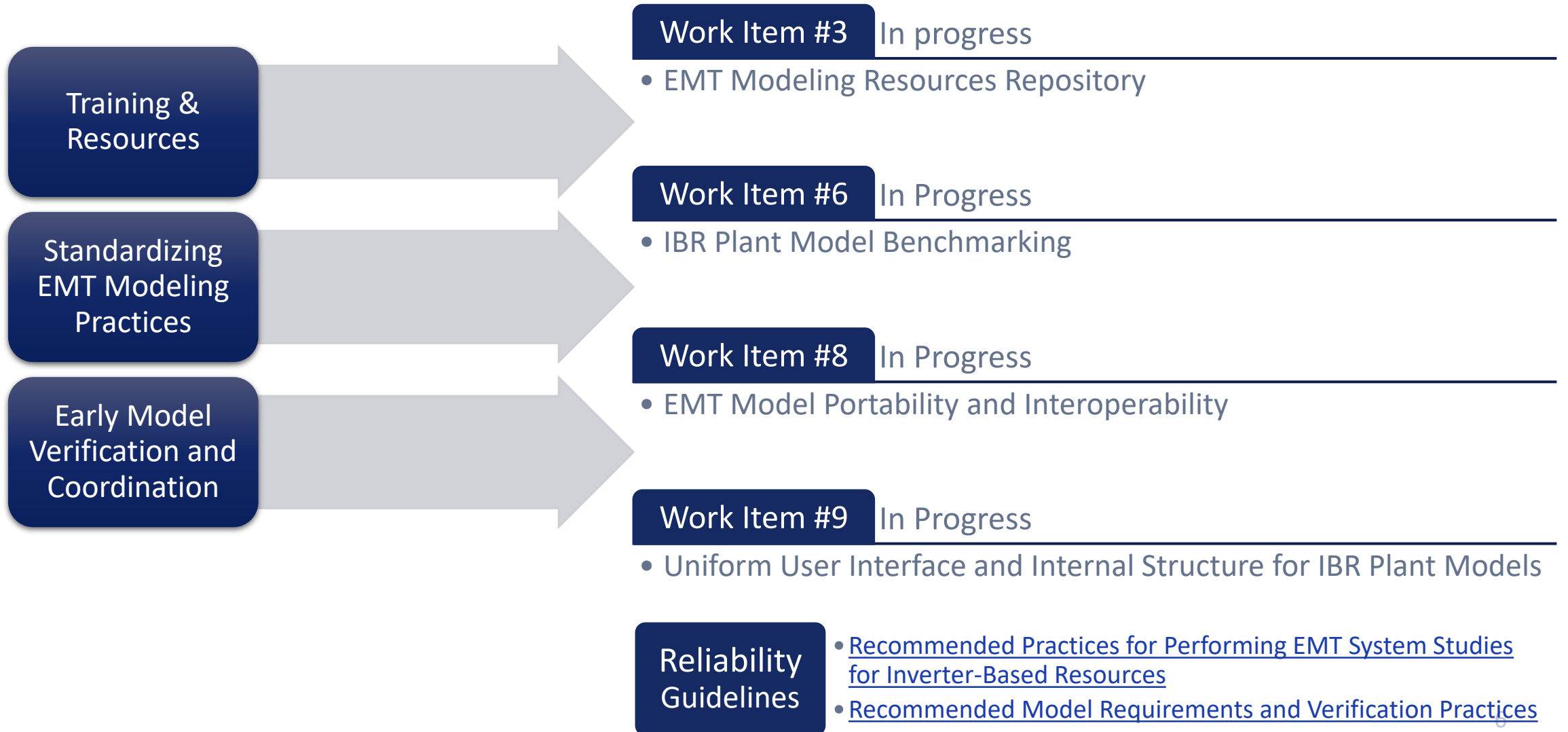
Near-term Action

- Broaden Training and Resources
- Standardization of EMT Modeling Practices
- Investment in Simulation Tools and Infrastructure
- Early Model Verification and Coordination
- Adaptability

Long-term Action

- Optimize Compatibility Standards
- Leverage High-Performance Computing Solutions
- Advance Automation and Interoperability
- Improve Data Sharing

EMT Adoption Survey Summary



Reliability Guidelines on EMT Modeling

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NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

Reliability Guideline

Electromagnetic Transient Modeling for BPS-Connected Inverter-Based Resources—Recommended Model Requirements and Verification Practices

March 2023

RELIABILITY | RESILIENCE | SECURITY

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Reliability Guideline

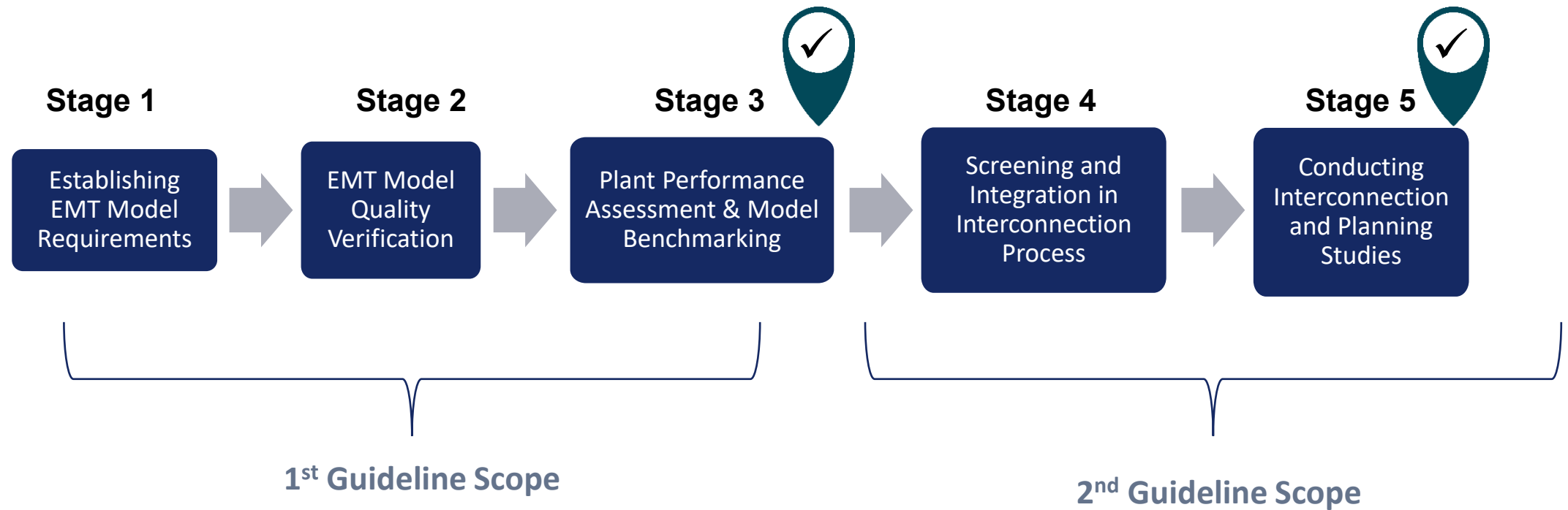
Recommended Practices for Performing EMT System Studies for Inverter-Based Resources

December 2024

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Staged Approach to EMT Modeling Adoption



Applicable Standards

New and upcoming standards requiring EMT modeling

New and Upcoming EMT-related Standards

New MOD-026-2

- IBR, FACTS, LCC HVDC, VSC HVDC
- TP, PC to identify legacy plants requires EMT models
- Documentation of Model Verification
- Documentation of Model Validation
 - IBR Unit Model Validation for large signal disturbance
- Positive sequence model and EMT model benchmarking

Standard Project 2022-04

Potentially Affected Standards

- FAC-001 – Facility Interconnection Requirements
- FAC-002 – Facility Interconnection Studies
- MOD-032 – Data for Power System Modeling and Analysis
- TPL-001 – Transmission System Planning Performance Requirements



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Discussion