

NERC MOD B: Proposals and discussion regarding improvements to NERC Reliability Standards MOD-010 through MOD-015

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- Introductions of panelists and overview
- Standards informal development background, MOD-010 through MOD-015 recommendations
- Walkthrough of standards and changes in proposals
- Roles of the PC and TP
- Roles of BA, GO, LSE, RP, TO, TSP
- Interconnection model building impact
- Distinction between responsibilities in these proposals and the generator verification standards
- Relationship to entity responsibilities under TPL-001-4
- Implementation Plan (timeframes)

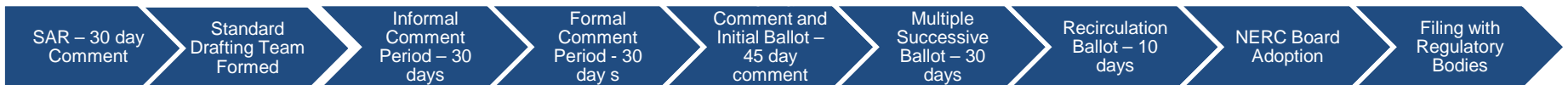
Development Process and Informal Efforts

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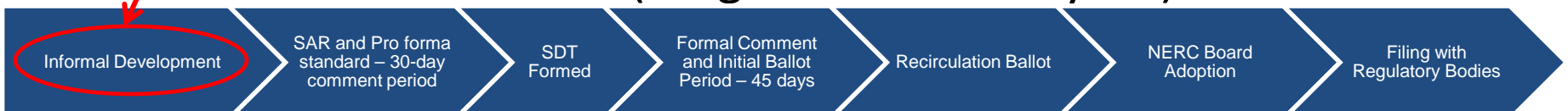
- August 2012 NERC Board of Trustees Meeting
 - FERC commissioners urged the industry to focus on creating a more efficient standards development process
 - NERC CEO focused on revamping the standards process for more efficiency and efficacy
 - NERC Board issued a resolution instructing the SPIG, MRC, SC, NERC staff and industry stakeholders to reform its standards program (November 2012)

Old Standards Process (1 to 3 years)

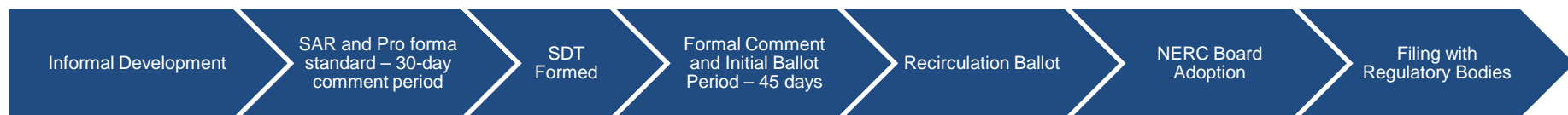


Resolving issues starts early

Revised Standards Process (Target: less than 1 year)



Revised Standards Process (Target: less than 1 year)



- Informal development - revised portion of the development process:
 - Ad-hoc group
 - Identify issues and possible solutions
 - Create pro forma Standard or proposed approaches
 - Create Standards Authorization Request (SAR)
- Post SAR and accompanying proposals
- Formal development (SDT formation through Filing)

- Three Separate Informal Efforts related to MOD standards:
 - MOD A: ATC/TTC/CBM (MOD-001, -004, -028, -029, and -030)
 - MOD B: Modeling Data (MOD-010 through MOD-015)
 - MOD C: Demand Data (MOD-016 through MOD-021)
- Emphasis on proposals to address outstanding FERC directives, mostly from FERC Order No. 693
- Outreach and Engagement:
 - Use industry subject matter experts
 - Work on issues related to consensus early
 - Maximize efficiency and use of resources during formal development
 - Support transition to formal development
 - Reduce breadth of issues requiring significant comment and resolution
 - Workshops and other opportunities for involvement

- Use Experts and Resources throughout project – pull in as needed
- Extended group members
 - Internal SMEs
 - Legal staff
 - ERO Compliance Operations
 - Standards Committee Member
 - Regional Entities
 - ERO Event Analysis
- Industry Experts
 - Researchers
 - Trades
 - FERC
 - NERC Committees
 - Standards Committee Member
 - Regional Entities

- Proposals include mechanisms to support “Results Based Standards” (RBS) format. Three types of RBS requirements:
 - Performance-based
 - Risk-based (preventive)
 - Capability-based
- Consider “Paragraph 81” (P81) criteria to ensure elimination of requirements that require responsible entities to conduct an activity or task that does little, if anything, to benefit or protect reliable operation of the Bulk Electric System (BES)
- Involving compliance and enforcement considerations early (e.g., concurrent Reliability Standard Audit Worksheet (RSAW) development, etc).

- FERC Directives remain outstanding
- August 14, 2003 and subsequent blackout recommendations
- IVGTF recommendations (April 2009)
- MVTF (MWG) whitepaper recommendations (Dec 2010)
- NERC SAMS whitepaper recommendations (Dec 2012)
- Status of Current Modeling Data Standards (Not all approved; “fill in the blank”)
- Why the MOD standards are necessary as standards and not as a data request:
 - Section 1600 data request not applicable outside of U.S.
 - Section 1600 data request not mandatory and no mechanism to compel participation without pursuing as federal action under section 215

- Directives Summary:
 - 1 Directive from FERC Order No. 890
 - 14 Directives from FERC Order No. 693
- FERC Order 890 Directive:
 - Paragraph 290: incorporate periodic review and modification of models, with certain criteria

- FERC Order 693 Directives:
 - Paragraph 1148: Require filing of all contingencies used in performing steady-state system operation and planning studies.
 - Paragraph 1152, 1181: address confidentiality issues
 - Paragraph 1154: include TOP as an applicable entity
 - Paragraphs 1155, 1162, 1184, 1199 : include PA/PC as an applicable entity “because (it) is the entity responsible for the coordination and integration of transmission facilities and resource plans, as well as one of the entities responsible for the integrity and consistency of the data.”
 - Paragraph 1178, 1183: add requirement to provide a list of the faults and disturbances used in performing dynamics system studies for system operation and planning, and require TSP to provide the lists

- FERC Order 693 Directives continued:
 - Paragraph 1197: permit entities to estimate dynamics data if they are unable to obtain unit specific data . . . But require that the results of these dynamics models be compared with actual disturbance data to verify accuracy
 - Paragraph 1210: require models be validated against actual system responses
 - Paragraph 1211: require actual system events be simulated and if model output is not within the accuracy required, the model shall be modified to achieve the necessary accuracy
 - Paragraph 1220: require actual system events be simulated and dynamics system model output be validated against actual system responses

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Event Recommendations

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- **NERC Recommendation 14:** “The regional reliability councils shall within one year establish and begin implementing criteria and procedures for validating data used in power flow models and dynamic simulations by benchmarking model data with actual system performance.”
- **Task Force Recommendation 24:** Improve quality of system modeling data and data exchange practices. “The Task Force supports these requirements strongly. The Task Force also recommends that FERC and appropriate authorities in Canada require all generators, regardless of ownership, to collect and submit generator data to NERC, using a regulator-approved template.”

- September 18, 2007 (MRO)
 - Develop efficient translation of telemetry data for model benchmarking
 - Initiate a dynamic model validation regime to benchmark models
 - “develop a standard/requirement regarding reporting electrical, dynamics and machine and plant protection characteristics of non-conventional (e.g., wind, solar, small hydro) generation data”
- September 8, 2011 (Pacific Southwest)
 - Recommendation 10: Benchmark WECC dynamic models against actual performance
 - Recommendation 16: Ensure consistencies in model parameters between planning and RTCA models

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Other Recommendations

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- IVGTF (Integration of Variable Generation Task Force) Special Report titled "Accommodating High Levels of Variable Generation" (April 2009)
 - Standard, valid, generic, non-confidential, and public power flow and stability models (variable generation) are needed and must be developed, enabling planners to maintain bulk power system reliability.
 - IVGTF Work Plan: Review the Modeling, Data and Analysis Standards (MOD) for improvements required to support simulation of power systems with high amounts of variable generation.

- Improve and Strengthen MOD-010 through MOD-015
- Standardization of functional requirements, including data exchange formats
 - Standardized Component Models
- Industry should make periodic model validation and benchmarking an integral part of off-line study model maintenance
- Industry should validate operational planning (offline) models by comparing them with models developed from real-time data

- Reduce the quantity of the MOD standards
- Add short circuit data to MOD standards
- Add to the Requirement to Supply Data and Models:
 - Identify responsibility to provide and receive data (who provides what data to whom)
 - Provision for acceptability of data
 - Require specification and use of standard format
 - Consider how to deal with new technology
 - Shareability

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Proposed Approach

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- Modeling Data standard:
 - Require PC to develop data requirements and reporting procedures
 - Data owners to submit data according to those procedures
 - Clarified requirement to address technical concerns with data
 - Eliminated reference to (proposed) list of modeling organizations and require PCs to submit data for interconnection model to NERC or its designee
 - Clarified several Attachment 1 criteria

- Validation Standard:
 - Transitioned requirement to “implement a documented process” that meets the criteria specified
 - Eliminated RC from applicability
- TPL-001-4:
 - Conforming change to update cross-reference to MOD-010 and MOD-012

- Consolidation into single modeling standard for data collection for steady-state, dynamics, and short circuit
- Requires Planning Coordinators to develop data requirements and reporting procedures for data owners in their planning area
- Attachment approach for data requirements
- Separate standard for validation (ties-in to FERC Directives from Order No. 693)

- Proposed single standard (R1):
 - Requires each Planning Coordinator, in conjunction with each of its Transmission Planners, to develop data requirements and reporting procedures, including specification of data required (Attachment 1), data format, shareability, level of detail, case types, and schedule.
 - Attachment 1: Specifies a three column detailed matrix of data requirements for steady-state, dynamics, and short-circuit data

- Proposed single standard (R2):
 - Requirement R2: provide steady-state, dynamics, and short circuit data to Planning Coordinator(s) and Transmission Planner(s) according to the data requirements developed in Requirement R1.

- Proposed single standard (R3):
 - Requirement R3: Provides a requirement for entities that submit data to provide responses to certain technical concerns when notified by Planning Coordinator or Transmission Planner
 - Provide either updated data or an explanation with a technical basis for maintaining the current data;
 - If requested by the notifying Planning Coordinator or Transmission Planner, provide additional dynamics data describing the characteristics of the model such as block diagrams, values and names for all model parameters, and a list of all state variables; and
 - Provide the response within 30 calendar days (unless a longer time period agreed upon with PC or TP)
 - Uses format similar to MOD-26-1 requirements (*see, e.g., MOD-26-1, Requirement R3*)

- Proposed single standard (R4):
 - To facilitate creation of interconnection-specific models, a requirement for Planning Coordinator to submit data collected under Requirement R2 NERC or NERC's designee

- Why a separate standard for Validation?
 - Directives related to Validation
 - Harder to get consensus on validation approaches
 - Relationship with the data standard
- Validation standard
 - Not duplicate other standards like MOD-025, -026, -027
 - Focus on what PC could reasonably do
 - Interconnection-wide phenomena outside PC's purview
- How prescriptive should the standard be?
 - Focus on results
 - Leave judgment to the PC
 - Added some information in the guidance section at the bottom of the standard

- Single requirement:

R1. Each Planning Coordinator must implement a documented process to validate the data used for steady state and dynamic analyses (the data submitted under MOD-TBD-01 (the single modeling data standard)) for its planning area against actual system responses that includes, at a minimum, the following items: *[Violation Risk Factor:] [Time Horizon:]*

- Validate its portion of the system in the power flow model by comparing it to a state estimator case to check for discrepancies that the Planning Coordinator determines are large or unexplained at least once every 24 calendar months and through simulation of a local event, if any.
- Validate its portion of the system in the dynamic models at least once every 24 calendar months and through simulation of a dynamic local event, if any. Complete the simulation within 12 calendar months of the local event.
- Confirm or correct the model for accuracy in coordination with the data owner(s) when the Planning Coordinator determines the discrepancy between actual system response and expected system performance is too large.

- TPL-001-4 references MOD-010 and MOD-012
- Proposed conforming change to correct the cross reference so that it corresponds to the changes made in the MOD proposals

- Roles of the PC and TP
- Roles of BA, GO, LSE, RP, TO, TSP
- Interconnection model building impact
- Distinction between responsibilities in these proposals and the generator verification standards (MOD-025-2, MOD-026-1, and MOD-027-1)
- Relationship to entity responsibilities under TPL-001-4
- Implementation Plan (timeframes)

- Upcoming MOD B Webinars and Workshops
 - June 25, 2013—Location TBD (DC/Baltimore/VA area) Industry Technical Conference
- Key Dates (for planning purposes; subject to change)
 - July 2013 – Posting of the SAR for 30 day comment
 - July/August 2013 – Initial ballot posting: Pro-forma Standard and RSAW for 45 day comment
 - October 2013 – Recirculation Ballot
 - November 2013 – Board of Trustees Adoption
 - December 2013 – File with FERC

- Email list for information distribution specific to MOD B effort
 - To be added to the list, contact Steven Noess, steven.noess@nerc.net
- MOD B Web site:
<http://www.nerc.com/pa/Stand/Pages/MODBInformalDevelopmentProjectRF.aspx>
- Attend technical conferences (details to follow):
 - June 25, 2013: Baltimore, MD



Questions and Answers