NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Consideration of Issues and Directives

MOD B

Working Draft, July 9, 2013

Project 2010-03 - Modeling Data		
Issue or Directive	**Source**	**Consideration of Issue or Directive**
Para 290. The Commission directs public utilities, working through NERC, to modify the reliability standards MOD-010 through MOD-025 to incorporate a requirement for the periodic review and modification of models for (1) load flow base cases with contingency, subsystem, and monitoring files, (2) short circuit data, and (3) transient and dynamic stability simulation data, in order to ensure that they are up to date. This means that the models should be updated and benchmarked to actual events. We find that this requirement is essential in order to have an accurate simulation of the performance of the grid and from which to comparably calculate ATC, therefore increasing transparency and decreasing the potential for undue discrimination by transmission providers.	FERC Order No. 890	The concept that models should be updated and benchmarked, through periodic review and modification, are fully covered by both new standards addressing modeling data MOD-032-1 and model validation MOD-033-1. MOD-032-1 thoroughly addresses modeling data submission and review, along with providing a mechanism to update data that may have technical issues. MOD-033-1 addresses validation of models to ensure that expected system behavior acceptably matches actual system response. Additionally, MOD-032-1, Requirement R1 covers item (2) short circuit data and item (3) transient and dynamic stability simulation data by requiring those items as part of the data requirements, and MOD-032-1, Requirement R4 provides a feedback loop for issues of data from the data owners. The portion of the directive related to contingency, subsystem, and monitoring files were addressed by MOD-001-1a, Requirement R9, and further consideration, if any, is being addressed by the MOD A effort.

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Para 1148. Supported by many commenters, we adopt the NOPR proposal to direct the ERO to modify MOD-010-0 to require filing of all of the contingencies that are used in performing steady-state system operation and planning studies. We believe that access to such information will enable planners to accurately study the effects of contingencies occurring in neighboring systems on their own systems, which will benefit reliability. Because of the lack of information on contingency outages and the automatic actions that result from these contingencies, planners have not been able to analyze neighboring conditions accurately, thereby potentially jeopardizing reliability on their own and surrounding systems. This requirement will make transmission planning data more transparent, consistent with Order No. 890 requiring greater openness of the transmission planning process.	FERC Order No. 693	For operations, the sharing of contingencies is covered by MOD-001-1a, and for planning, TPL-001-4 requires lists of Contingencies be compiled in Requirements R3 and R4 as part of the required planning assessments in that standard. Those planning assessments must be distributed to adjacent PCs and TPs, and to any other functional entity with a reliability need, addressing the directives' focus related to access to information by planners in paragraphs 1148, 1154, 1178, and 1183.
Para 1154. We agree with APPA, SoCal Edison and TVA that the functional entity responsible for providing the list of contingencies in performing planning studies should be the transmission planner, instead of the transmission owner, as proposed in the NOPR. We also agree with APPA that the transmission operator should be one of the entities required to list contingencies used to perform	FERC Order No. 693	For operations, the sharing of contingencies is covered by MOD-001-1a, and for planning, TPL-001-4 requires lists of Contingencies be compiled in Requirements R3 and R4 as part of the required planning assessments in that standard. Those planning assessments must be distributed to adjacent PCs and TPs, and to any other functional entity with a reliability need, addressing the directives' focus related to access to information by planners in paragraphs 1148, 1154, 1178, and 1183.

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operational studies. Transmission operators are usually responsible for compiling the operational contingency lists for both normal and conservative operation. Therefore, we direct the ERO to modify MOD-010-0 to include transmission operators as an applicable entity.		Transmission Operator has also been added as an applicable entity in MOD-032-1
Para 1155. We adopt our NOPR proposal that the planning authority should be included in this Reliability Standard because the planning authority 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. We disagree with APPA that it is duplicative and unnecessary to require the planning authority to provide all of this information. However, we direct the ERO, as the entity charged with developing Reliability Standards, to address all of these concerns and to develop a consensus standard using its Reliability Standard development process.	FERC Order No. 693	The Planning Authority plays an integral role in the standard modifications, both receiving data from the respective data owners, submitting data for its planning area to support the interconnection models, and validating models relative to their planning areas. The referenced attachment 1 specifies the specific "at a minimum" data for steady-state, dynamics, and short circuit data, establishing a level of consistency of data to support larger-scale, interconnection-specific models. However, the standard also recognizes that operational disparities may exist across North America, providing sufficient flexibility for Planning Coordinators to specify format and cases most appropriate to their specific circumstances and interconnection.
Para 1162. We reiterate our position stated in the NOPR that the planning authority should be included in this Reliability Standard because the planning authority is the entity responsible for the coordination and integration of transmission facilities and resource planning, as well as	FERC Order No. 693	See the response to Paragraph 1155.

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one of the entities responsible for the integrity and consistency of the data. Therefore, we direct the ERO to add the planning authority to the applicability section of this Reliability Standard.		
Para 1178. Supported by several commenters, we adopt the NOPR proposal and direct the ERO to modify MOD-012-0 by adding a new requirement to provide a list of the faults and disturbances used in performing dynamics system studies for system operation and planning. We believe that access to such information will enable planners to accurately study the effects of disturbances occurring in neighboring systems on their own systems, which will benefit reliability. This requirement will also make transmission planning data more transparent, consistent with Order No. 890, which calls for greater openness of the transmission planning process on a regional basis.	FERC Order No. 693	For operations, the sharing of contingencies is covered by MOD-001-1a, and for planning, TPL-001-4 requires lists of Contingencies be compiled in Requirements R3 and R4 as part of the required planning assessments in that standard. Those planning assessments must be distributed to adjacent PCs and TPs, and to any other functional entity with a reliability need, addressing the directives' focus related to access to information by planners in paragraphs 1148, 1154, 1178, and 1183.
Para 1183. We agree with APPA that the functional entity responsible for providing the fault and disturbance list should be the transmission planner, instead of the transmission owner, as proposed in the NOPR. We also agree with APPA that the transmission operator should be added to the list of applicable entities in the Reliability Standards development process. Therefore, we direct the ERO to modify MOD-012-0 to require the	FERC Order No. 693	For operations, the sharing of contingencies is covered by MOD-001-1a, and for planning, TPL-001-4 requires lists of Contingencies be compiled in Requirements R3 and R4 as part of the required planning assessments in that standard. Those planning assessments must be distributed to adjacent PCs and TPs, and to any other functional entity with a reliability need, addressing the directives' focus related to access to information by planners in paragraphs 1148, 1154, 1178, and 1183.

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transmission planner to provide fault and disturbance lists.		For the second part of the directive, the Transmission Operator has been added as an applicable entity in MOD-032-1
Para 1184. We adopt our NOPR proposal that planning authorities should be included in this Reliability Standard because the planning authority 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. We therefore direct the ERO to add the planning authority to the list of applicable entities.	FERC Order No. 693	See response to paragraph 1155.
Para 1197. We agree with many commenters and direct the ERO to modify the Reliability Standard to permit entities to estimate dynamics data if they are unable to obtain unit specific data for any reason, not just for units constructed prior to 1990. Achieving the most accurate possible picture of the dynamic behavior of the Interconnection requires the use of actual data. We disagree with FirstEnergy and EEI and reject the 1990 cut-off date, because the age of the unit alone may not be the only reason why unit-specific data is unavailable. We agree with the Small Entities Forum that the Reliability Standard should include Requirements that such estimates be based on sound engineering principles and be subject to technical review and approval of any	FERC Order No. 693	This paragraph was clarified in FERC Order 693-A, paragraph 131, which stated "that '[a]chieving the most accurate possible picture of the dynamic behavior of the Interconnection requires the use of actual data,'" but acknowledges "that, in certain circumstances, actual data may not be initially available and only obtained through 'verification of the dynamic models with actual disturbance data.'" This is being addressed by MOD-032, Requirement R4, which provides a mechanism to obtain more accurate information and data in cases where the initial data provided has technical or accuracy concerns. Furthermore, MOD-033-1 requires comparison of actual disturbance data to verify accuracy of dynamics models.

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estimates at the regional level. That said, the Commission directs that this Reliability Standard be modified to require that the results of these dynamics models be compared with actual disturbance data to verify the accuracy of the models.		
Para 1199. We adopt our NOPR proposal and direct the ERO to expand the applicability section in this Reliability Standard to include planning authorities because they are the entities 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.	FERC Order No. 693	See response to paragraph 1155
Para 1210. We maintain our position set forth in the NOPR that analysis of the Interconnection system behavior requires the use of accurate steady-state models. Therefore, we direct the ERO to modify the Reliability Standard to include a requirement that the models be validated against actual system responses. We understand that NERC is incorporating recommendations from the Blackout Report and developing models for the Eastern Interconnection.	FERC Order No. 693	Standard MOD-033-1 addresses this directive, adding a validation process requirement for PCs aimed specifically at ensuring models are validated against actual system responses. Model validation for individual generators and/or power plants is already required by Reliability Standards MOD-025-2, MOD-026-1, and MOD-027-1.
Para 1211. Further, the maximum discrepancy between the model results and the actual system response should be specified in the Reliability Standard. The Commission believes that the maximum discrepancy between the	FERC Order No. 693	Similar to the consideration of paragraph 1210, Standard MOD-033-1, Requirement 1.1 addresses this directive, adding a validation process requirement for PCs that requires validation through simulation to ensure that the maximum discrepancy

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actual system performance and the model should be small enough that decisions made by planning entities based on output from the model would be consistent with the decisions of operating entities based on actual system response. We direct the ERO to modify MOD-014-0 through the Reliability Standards development process to require that actual system events be simulated and if the model output is not within the accuracy required, the model shall be modified to achieve the necessary accuracy.		between actual system performance and the model do not exceed the point where decisions made by the Planning Coordinator based on output from the model would be inconsistent with actual system response. In addition, the drafting team determined not to specify numeric accuracy thresholds in the standard itself. For instance, specifying percent for accuracy purposes is potentially problematic, as it may unintentionally exaggerate the degree of mismatch (e.g., 10 MW v. 20 MW (100% error) on a 345 KV line is not generally significant).
Para 1220. We maintain our position set forth in the NOPR that the analysis of Interconnection system behavior requires the use of accurate dynamics system models. Therefore, we direct the ERO to modify the Reliability Standard to include a requirement that the models be validated against actual system responses. We agree with EEI and NRC and confirm our position that a requirement to verify that dynamics system models are accurate should be a part of this Reliability Standard. We agree with EEI that this new requirement should be related to using the models to replicate events that occur on the system instead of developing separate testing procedures to verify the models. We direct the ERO to modify the standard to require actual system events be	FERC Order No. 693	See response to paragraph 1210.

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simulated and dynamics system model output be validated against actual system responses.		