Standard Development Timeline

This section is maintained by the drafting team during the development of the standard and will be removed when the standard becomes effective.

Development Steps Completed

1. SAR and supporting package posted for comment (~~Dates of posting TBD~~July 2013).
2. First posting for 45-day comment period and concurrent ballot (July 2013).
~~1.~~3. Second posting for a 45-day comment period and concurrent ballot (October 2013).

Description of Current Draft

This is the ~~first~~ second posting of this standard for a 45-day formal comment period and ~~initial~~ ballot. Several directives remain outstanding (including from FERC Order No. 693) that relate to MOD-010 through MOD-015. This standard and Standard MOD-033-1 ~~seek to~~ address the outstanding directives while simultaneously incorporating recommendations for improvement from the NERC Planning Committee's System Analysis and Modeling Subcommittee (SAMS).

Anticipated Actions	Anticipated Date
Post SAR	July 2013
45-day Formal Comment Period with Parallel ~~Initial~~ Ballot	July 2013
Additional 45-day Formal Comment Period with Parallel Ballot	October 2013
~~Recirculation~~ Final ballot	~~September~~ December 2013
BOT adoption	~~November~~ December 2013

Effective Dates

In those jurisdictions where regulatory approval is required, Requirements R1 and R2 shall become effective on the first day of the fourth calendar quarter after applicable regulatory approval or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities, and Requirements R3, R4, and R5 shall become effective on the first day of the eighth calendar quarter after applicable regulatory approval or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities. In those jurisdictions where no regulatory approval is required, this standard shall become effective on the first day of the fourth calendar quarter after Board of Trustees approval, and Requirements R3, R4, and R5 shall become effective on the first day of the eighth calendar quarter after Board of Trustees approval.

Formatted: Don't adjust space between Latin and Asian text, Don't adjust space between Asian text and numbers

Version History

Version	Date	Action	Change Tracking
1	TBD	Developed to consolidate and replace MOD-010-0, MOD -011-0, MOD-012-0, MOD-013-1, MOD-014-0, and MOD-015-0.1	

Definitions of Terms Used in Standard

None

When this standard has received ballot approval, the text boxes will be moved to the Application Guidelines Section of the Standard.

A. Introduction

1. **Title: Data for Power System Modeling and Analysis**

2. **Number: MOD-032-1**

3. **Purpose: To establish consistent modeling data requirements and reporting procedures for development of planning horizon cases necessary to support analysis of the reliability of the interconnected transmission system.**

4. **Applicability:**

    4.1. Functional Entities:

    4.1.1 Balancing Authorityies

    4.1.2 Generator Owners

    4.1.3 Load Serving Entity

    4.1.4 Planning Authority and Planning Coordinators (hereafter collectively referred to as "Planning Coordinator")

    This proposed standard combines "Planning Authority" with "Planning Coordinator" in the list of applicable functional entities. The NERC Functional Model lists "Planning Coordinator" while the registration criteria list "Planning Authority," and they are not yet synchronized. Until that occurs, the proposed standard applies to both Planning Authority and Planning Coordinator.

    4.1.5 Resource Planners

    4.1.6 Transmission Owners

    4.1.7 Transmission Planners

    4.1.8   Transmission Service Providers

5. **Effective Date:**

    MOD-032-1, Requirement R1 shall become effective on the first day of the first calendar quarter that is 12 months after the date that the standard is approved by an applicable governmental authority or as otherwise provided for in a jurisdiction where approval by an applicable governmental authority is required for a standard to go into effect. Where approval by an applicable governmental authority is not required, MOD-032-1, Requirement R1 shall become effective on the first day of the first calendar quarter that is 12 months after the date the standard is adopted by the NERC Board of Trustees or as otherwise provided for in that jurisdiction.

| Formatted: Font: Bold |
| Formatted: Tab stops: 1.5", Left |
| **Comment [SN1]:** The changes to the effective date language in the implementation plan are not material changes to the previously posted timelines. Rather, they are changes in effective date language format. |
| Formatted: Indent: Left: 0.65" |

MOD-032-1, Requirements R2, R3, and R4 shall become effective on the first day of the first calendar quarter that is 24 months after the date that the standard is approved by an applicable governmental authority or as otherwise provided for in a jurisdiction where approval by an applicable governmental authority is required for a standard to go into effect. Where approval by an applicable governmental authority is not required, MOD-032-1, Requirements R2, R3, and R4 shall become effective on the first day of the first calendar quarter that is 24 months after the date the standard is adopted by the NERC Board of Trustees or as otherwise provided for in that jurisdiction.

4.1.8

Formatted: Indent: Left: 0.65", No bullets or numbering

5.6. **Background:**

MOD-032-1 exists in conjunction with MOD-033-1, both of which are related to system-level modeling and validation. Standard MOD-032-1 is a consolidation and replacement of existing MOD-010-0, MOD-011-0, MOD-012-0, MOD-013-1, MOD-014-0, and MOD-015-0.1, and it requires a minimum level of data submission by applicable data owners to their respective Transmission Planners and Planning Coordinators to support the iInterconnection-wide case model building process in their iInterconnection. Standard MOD-033-1 is a new standard, and it requires each Planning Coordinator to implement a documented process to perform model validation within its planning area.

The transition and focus of responsibility upon the Planning Coordinator function in both standards are driven by several recommendations and FERC directives (to include several remaining directives from FERC Order No. 693), which are discussed in greater detail in the rationale sections of the standards. One of the most recent and significant set of recommendations came from the NERC Planning Committee's System Analysis and Modeling Subcommittee (SAMS). SAMS proposed several improvements to the modeling data standards, to include consolidation of the standards (that whitepaper is available from the December 2012 NERC Planning Committee's agenda package, item 3.4, beginning on page 99, here: http://www.nerc.com/comm/PC/Agendas%20Highlights%20and%20Minutes%20DL/2012/2012_Dec_PC%20Agenda.pdf).

B. **Requirements and Measures**

Rationale for R1:

This requirement consolidates the concepts from the original data requirements from MOD-011-0, Requirement R1, and MOD-013-0, Requirement R1. The original requirements specified types of steady-state and dynamics data necessary to model and analyze the ~~steady state~~steady-state conditions and dynamic behavior or response within each Interconnection. The original requirements, however, did not account for the collection of ~~short-circuit~~short circuit data also required to perform ~~short-circuit~~short circuit studies. The addition of ~~short-circuit~~short circuit data also addresses the outstanding directive from FERC Order No. 890, paragraph 290.

In ~~attempting to~~ developing a performance-based standard that would address the data requirements and reporting procedures for model data, ~~the MOD B informal standard development group found that~~ it was prohibitively difficult to account for all of the detailed technical concerns associated with the preparation and submittal of model data given that many of these concerns are dependent upon evolving industry modeling needs and software vendor terminology and product capabilities.

This requirement establishes the Planning Coordinator jointly with its Transmission Planners as the developers of technical model data requirements and reporting procedures to be followed by the data owners in the Planning Coordinator's~~its~~ planning area. FERC Order No. 693, paragraphs 1155 and 1162, also direct the standard be applicable to Planning Coordinators. The inclusion of the Transmission Planners in the applicability is intended to ensure that the Transmission Planners are able to participate jointly in the development of the data requirements and reporting procedures.

~~The requirement parts of Requirement R1 list the minimum set of items that must be included in the data requirements and reporting procedures developed by the Planning Coordinator.~~

~~Coordination between Planning Coordinators in the development of these requirements and reporting procedures is necessary in order to facilitate development of interconnection-wide models. While Requirement R1 does not require this coordination, Requirement R5 includes a requirement for the Planning Coordinators to submit model data for interconnection model building in the format specified by the ERO or its designee. It would likely be most efficient for Planning Coordinators to fashion their data requirements and reporting procedures with the interconnection-wide common format in mind.~~

(Rationale continued on next page)

B.

| Formatted: Font: Calibri |
| Formatted: Section |

Rationale for R1: Continued

This requirement is also consistent with the recommendations from the NERC System Analysis and Modeling Subcommittee (SAMS) White Paper titled "Proposed Improvements for NERC MOD Standards", available from the December 2012 NERC Planning Committee's agenda package, item 3.4, beginning on page 99, here:
 http://www.nerc.com/comm/PC/Agendas%20Highlights%20and%20Minutes%20DL/2012/2012_Dec_PC%20Agenda.pdf.

Aside from recommendations in support of strengthening and improving MOD-010 through MOD-015, the SAMS paper included the following suggested improvements:
1) reduce the quantity of MOD standards;
2) add short circuit data as a requirement to the MOD standards; and
3) supply data and models:
   a. add requirement identifying who provides and who receives data;
   b. identify acceptability;
   c. standard format;
   d. how to deal with new technologies (user written models if no standard model exists); and
   e. shareability.

These suggested improvements in the proposed approach are addressed by combining the existing standards into two new standards, one standard for the submission and collection of data, and one for the validation of the planning models. Adding the requirement for the submittal of short circuit data is also an improvement from the existing standards, and the collection of short-circuit data is also consistent with FERC Order No. 890, paragraph 290. In supplying data, the approach clearly identifies what data is required and which Functional Entity is required to provide the data.

Data submitted to effectively model a transmission system is typically on a per-element(s) basis as the transmission system evolves. Therefore, the submittal of data, and the checking of data, is much simplified by submitting all parameters describing a specific element simultaneously, thus reducing the possibility for error in the data. Typically all data in some shape or form consists of steady-state, dynamic, and short-circuit related data and is used for these types of analysis.

The approach for the collection of data is done using an attachment approach. The requirement uses an attachment approach to support data collection. The attachment specifically lists the Responsible Eentities that are required to provide each type of data and the steady-state, dynamics, and short circuit data that is required. This attachment takes an "at a minimum" approach for the collection of data needed for the construction of the models specific to seasonal cases and specific cases and scenario and for an interconnection wide model that is not software specific. It includes data for steady-state, dynamics and short circuit. It clearly holds the Responsible Entities that have the data accountable for providing data.

> **Rationale for R1: Continued**
>
> Finally, the decision to combine steady-state, dynamics, and short circuit data requirements into one requirement rather than three reflects that they all support the requirement of submission of data in general.
>
> ~~Rationale for R2:~~
>
> ~~An entity responsible for providing data under Requirement R3 has an obligation to submit data according to the data requirements and reporting procedures in its planning area developed under Requirement R1, and there may be cases, such as change of ownership, etc., that the submitting entity would need to request a copy of the data requirements and reporting procedures from its Planning Coordinator. This requirement ensures that the data requirements and reporting procedures developed under Requirement R1 by each Planning Coordinator are made available to an entity responsible for providing such data under Requirement R3.~~

R1.   Each Planning Coordinator~~, in conjunction with~~ and each of its Transmission Planners~~,~~ shall jointly develop steady-state, dynamics, and short circuit modeling data requirements and reporting procedures for ~~its~~ the Planning Coordinator's planning area that include~~, including~~: -*[Violation Risk Factor: Lower] [Time Horizon: Long-term Planning]*

    1.1.   The data listed in Attachment 1; and

    ~~1.1. Specification of the required data that includes, at a minimum, the data listed in Attachment 1;~~

    1.2.   Specifications of the following items consistent with procedures for building the Interconnection-wide case(s): ~~Specification of the d~~

        ~~1.2.~~**1.2.1.**   Data format;   ← **Formatted**

    ~~1.3. Specification that the data must be shareable on an interconnection-basis to support use in the interconnection models;~~

        ~~1.4.~~**1.2.2.**   ~~Specification of the l~~Level of detail to which equipment shall be modeled;   ← **Formatted**

        ~~1.5.~~**1.2.3.**   ~~Specification of the c~~Case types or scenarios to be modeled; and

        1.2.4.   A schedule for submission ~~or confirmation~~ of data at least once every 13 calendar months.

~~1.6.~~1.3.　　Specifications for distribution or posting of the data requirements and reporting procedures so that they are available to those responsible for providing data.

M1. Each Planning Coordinator and Transmission Planner shall provide evidence that it has jointly developed the required modeling data requirements and reporting procedures specified in Requirement R1.~~Examples of evidence include, but are not limited to, dated documentation or records that the required modeling data requirements and reporting procedures meet the specifications in Requirement R1.~~

> **Formatted:** Indent: Left: 0.25"

~~**R2.**　　Each Planning Coordinator shall provide its data requirements and reporting procedures developed under Requirement R1 to any Balancing Authority, Generator Owner, Load Serving Entity, Resource Planner, Transmission Owner, or Transmission Service Provider in its planning area within 30 calendar days of a written request for the data requirements and reporting procedures. [Violation Risk Factor: Medium] [Time Horizon: Long-term Planning]~~

~~**M2.**　　Each Planning Coordinator shall provide evidence, such as email records or postal receipts showing recipient and date, that it has distributed the requested data requirements and reporting procedures within 30 days of receiving a written request in accordance with Requirement R2; or a statement by the Planning Coordinator that it has not received a request for its data requirements and reporting procedures.~~

> **Formatted:** Requirement, Indent: Left: 0.25", Hanging: 0.4", No bullets or numbering

Rationale for R2~~3~~:

~~The approach in this~~This requirement ~~to submit data to the Planning Coordinator~~ satisfies the directive from FERC Order No. 693, paragraph 1155, which directs 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."

~~It also accounts for areas where a BA may have more than one PC. It does not create a requirement for the Planning Coordinator or Transmission Planner, as entities receiving data. It does, however, allow for instances where a Transmission Planner may serve only as a conduit for the collection of data on behalf of functional entities if all parties mutually agree. The Responsible Entity required to supply the data in those cases is still accountable for the obligation to provide the data. In those instances, the intent of the requirement is not to change those established processes, but to reinforce and emphasize accountability for data provided by those entities that are in the best position to have correct data.~~

R3.R2.　　Each Balancing Authority, Generator Owner, Load Serving Entity, Resource Planner, Transmission Owner, and Transmission Service Provider shall provide steady-state, dynamics, and short circuit modeling data to its Transmission Planner(s) and Planning Coordinator(s) according to the data requirements and reporting procedures developed by its Planning Coordinator and Transmission Planner in Requirement R1. For data that has not changed since the last submission, a written confirmation that the data has not changed is sufficient. *[Violation Risk Factor: Medium] [Time Horizon: Long-term Planning]*

M3.M2.　　Each registered entity identified in Requirement R2 shall provide evidence, such as email records or postal receipts showing recipient and date, that it has submitted the required modeling data Examples of evidence include, but are not limited to, dated documentation or records of submission by a registered entity of the required data (to its Transmission Planner(s) and Planning Coordinator(s); or written confirmation that the data has not changed.

Rationale for R34: In order to maintain a certain level of accuracy in the representation of a power system, the data that is submitted must be correct, periodically checked, and updated. Data used to perform ~~power flow~~steady-state, dynamics, and ~~short-circuit~~short circuit studies can change, for example, as a result of new planned transmission construction (in comparison to as-built information) or changes performed during the restoration of the transmission network due to weather-related events. One set of data that change~~s~~s on a more frequent basis is load data, and updates to load data are needed when new improved forecasts are created.

This requirement provides a mechanism for the Planning Coordinator and Transmission Planner (that does not exist in the current standards) to collect corrected data from the entities that have the data. It provides a feedback loop to address technical concerns related to the data when the Planning Coordinator or Transmission Planner identifies technical concerns, such as concerns about the usability of data or simply that the data is not in the correct format and cannot be used. The requirement also establishes a time-frame for response to address timeliness.

~~R4.~~R3.　　Upon ~~delivery~~ receipt of written notification from its Planning Coordinator or Transmission Planner regarding technical concerns with the data submitted under Requirement R2~~3~~, including the technical basis or reason for the technical concerns, each notified Balancing Authority, Generator Owner, Load Serving Entity, Resource Planner, Transmission Owner, or Transmission Service Provider shall respond to the notifying Planning Coordinator or Transmission Planner as follows: *[Violation Risk Factor: Lower] [Time Horizon: Long-term Planning]*

　　~~4.1.~~3.1.　　Provide either updated data or an explanation with a technical basis for maintaining the current data;

　　~~4.2.　If requested by the notifying Planning Coordinator or Transmission Planner, provide additional dynamics data describing the characteristics of the model, including block diagrams, values and names for all model parameters, and a list of all state variables; and~~

　　~~4.3.~~3.2.　　Provide the response within ~~30~~ 90 calendar days of receipt, unless a longer time period is agreed upon by the notifying Planning Coordinator or Transmission Planner.

~~M4.~~M3.　　~~Examples of evidence include, but are not limited to: dated records of a written request from the Transmission Planner or Planning Coordinator notifying a Balancing Authority, Generator Owner, Load Serving Entity, Resource Planner, Transmission Owner, or Transmission Service Provider regarding technical concerns, and additional evidence demonstrating the response to the request by the notified registered entity meets the specifications of Requirement R4~~Each registered entity identified in Requirement R3 that has received written notification from its Planning Coordinator

or Transmission Planner regarding technical concerns with the data submitted under Requirement R2 shall provide evidence, such as email records or postal receipts showing recipient and date, that it has provided either updated data or an explanation with a technical basis for maintaining the current data to its Planning Coordinator or Transmission Planner within 90 calendar days of the request,; or a statement by the Balancing Authority, Generator Owner, Load Serving Entity, Resource Planner, Transmission Owner, or Transmission Service Provider that it has not received written notification regarding technical concerns with the data submitted.

Rationale for R54:

This requirement will replace MOD-014 and MOD-015

It This requirement recognizes the differences among iInterconnections in model building processes, butand it creates an obligation for Planning Coordinators to provide make availablethe data for its planning area in a manner that accounts for those differences.

The requirement creates a clear expectation that Planning Coordinators will provide make available data that they collect under Requirement R3 in support of their respective Interconnection-wide case(s)interconnection models. While different entities in each of the three iInterconnections create the interconnection modelsInterconnection-wide case(s), the requirement to submit the data to the "ERO or its designee" supports a framework whereby NERC, in collaboration and agreement with those other organizations, can designate the appropriate organizations in each iInterconnection to build the interconnection-specific modelspecific Interconnection-wide case(s). It does not prescribe a specific group or process to build the larger Interconnection-wide case(s) models, but only requires the Planning Coordinators to submit make available data in support of their creation, consistent with the SAMS Proposed Improvements to NERC MOD Standards (at page 3) that, "industry best practices and existing processes should be considered in the development of requirements, *as many entities are successfully coordinating their efforts.*" (Emphasis added).

This requirement is about the Planning Coordinator's obligation to make information available for use in the Interconnection-wide case(s);, it is not a requirement to build the Interconnection-wide case(s).

For example, under current practice, the Eastern Interconnection Reliability Assessment Group (ERAG) builds the Eastern Interconnection and Quebec Interconnection-wide modelscases, the Western Electricity Coordinating Council (WECC) builds the Western Interconnection-wide modelscases, and the Electric Reliability Council of Texas (ERCOT) builds the Texas Interconnection-wide cases models. This requirement does not require a change to that construct, and, assuming continued agreement by those organizations, ERAG, WECC, and ERCOT could be the "designee" for each Iinterconnection contemplated by this requirement. Similarly, the requirement does not prohibit transition, and the requirement remains for the Planning Coordinators to provide make available the information to the ERO or to whomever the ERO has coordinated with and designated as the recipient of such information for purposes of creation of each of the Interconnection- wide casesmodels.

R5.R4.   Each Planning Coordinator ~~must~~ shall ~~submit~~ make available models for its planning area~~the~~ reflecting data provided to it under Requirement R23 to the Electric Reliability Organization (ERO) or its designee to support creation of the ~~interconnection~~Interconnection-wide case model(s) that includes the Planning Coordinator's planning area. ~~as follows:~~ *[Violation Risk Factor: Medium] [Time Horizon: Long-term Planning]*

> ~~5.1.   In the format and according to the schedule specified by the ERO or its designee; and~~

> ~~5.2.   Include documentation and reasons for data modifications, if any.~~

M5.   ~~Examples of evidence may include, but are not limited to, dated documentation or records indicating data submission from the Planning Coordinator to the ERO or its designee according to Requirement R5.~~Each Planning Coordinator shall provide evidence, such as email records or postal receipts showing recipient and date, that it has submitted models for its planning area reflecting data provided to it under Requirement R2 when requested by the ERO or its designee.

C. Compliance

    1. Compliance Monitoring Process

        1.1. Compliance Enforcement Authority

As defined in the NERC Rules of Procedure, "Compliance Enforcement Authority" means NERC or the Regional Entity in their respective roles of monitoring and enforcing compliance with the NERC Reliability Standards.

~~Regional Entity~~

        1.2. Evidence Retention

The following evidence retention periods identify the period of time an entity is required to retain specific evidence to demonstrate compliance. For instances where the evidence retention period specified below is shorter than the time since the last audit, the Compliance Enforcement Authority may ask an entity to provide other evidence to show that it was compliant for the full time period since the last audit.

The Applicable Entity shall keep data or evidence to show compliance with Requirements R1 through R4, and Measures M1 through M4, since the last audit, unless directed by its Compliance Enforcement Authority to retain specific evidence for a longer period of time as part of an investigation.

If an Applicable Entity is found non-compliant, it shall keep information related to the non-compliance until mitigation is complete and approved, or for the time specified above, whichever is longer.

The Compliance Enforcement Authority shall keep the last audit records and all requested and submitted subsequent audit records. ~~The following evidence retention periods identify the period of time an entity is required to retain specific evidence to demonstrate compliance. For instances where the evidence retention period specified below is shorter than the time since the last audit, the CEA may ask an entity to provide other evidence to show that it was compliant for the full time period since the last audit.~~

~~The Responsible Entity shall keep data or evidence to show compliance as identified below unless directed by its CEA to retain specific evidence for a longer period of time as part of an investigation:~~

- ~~Each Responsible Entity shall retain evidence of each requirement in this standard for three calendar years.~~

- ~~If a Responsible Entity is found non-compliant, it shall keep information related to the non-compliance until mitigation is complete and approved or for the time specified above, whichever is longer.~~

- ~~The CEA shall keep the last audit records and all requested and submitted subsequent audit records.~~

1.3. Compliance Monitoring and Assessment Processes:

Refer to the NERC Rules of Procedure for the Compliance Monitoring and Assessment processes.~~Compliance Audits~~

~~Self-Certifications~~

~~Spot Checking~~

~~Compliance Violation Investigations~~

~~Self-Reporting~~

~~Complaints Text~~

1.4. Additional Compliance Information

None

Table of Compliance Elements

R #	Time Horizon	VRF	Violation Severity Levels			
			Lower VSL	**Moderate VSL**	**High VSL**	**Severe VSL**
R1	**Long-term Planning**	**Lower**	The Planning Coordinator and Transmission Planner (s) developed steady-state, dynamics, and short circuit modeling data requirements and reporting procedures, but failed to include less than or equal to 25% of the required components specified in Requirement R1.	The Planning Coordinator and Transmission Planner (s) developed steady-state, dynamics, and short circuit modeling data requirements and reporting procedures, but failed to include greater than 25% or less than or equal to 50% of the required components specified in Requirement R1.	The Planning Coordinator and Transmission Planner (s) developed steady-state, dynamics, and short circuit modeling data requirements and reporting procedures, but failed to include greater than 50% or less than or equal to 75% of the required components specified in Requirement R1.	The Planning Coordinator and Transmission Planner (s) did not develop any steady-state, dynamics, and short circuit modeling data requirements and reporting procedures required by Requirement R1; OR The Planning Coordinator and Transmission Planner (s) developed steady-state, dynamics, and short circuit modeling data requirements and reporting procedures, but failed to include greater than 75% of the required components specified in Requirement R1.

Formatted Table

~~R2~~	~~Long-term Planning~~	~~Medium~~	~~The Planning Coordinator failed to provide its data requirements and reporting procedures according to Requirement R2 within 30 calendar days of a written request but did provide them within 45 calendar days.~~	~~The Planning Coordinator failed to provide its data requirements and reporting procedures according to Requirement R2 within 30 calendar days of a written request but did provide them within greater than 45 calendar days but less than or equal to 60 calendar days.~~	~~The Planning Coordinator failed to provide its data requirements and reporting procedures according to Requirement R2 within 30 calendar days of a written request but did provide them within greater than 60 calendar days but less than or equal to 75 calendar days.~~	~~The Planning Coordinator failed to provide its data requirements and reporting procedures according to Requirement R2 within 30 calendar days of a written request or did provide in greater than 75 calendar days.~~
R2~~3~~	Long-term Planning	Medium	The Balancing Authority, Generator Owner, Load Serving Entity, Resource Planner, <u>Transmission Owner,</u> or Transmission Service Provider provided steady-state, dynamics, and short circuit modeling data to its Transmission Planner(s) and Planning Coordinator(s), but failed to provide less	The Balancing Authority, Generator Owner, Load Serving Entity, Resource Planner, <u>Transmission Owner,</u> or Transmission Service Provider provided steady-state, dynamics, and short circuit modeling data to its Transmission Planner(s) and Planning Coordinator(s), but failed to provide	The Balancing Authority, Generator Owner, Load Serving Entity, Resource Planner, <u>Transmission Owner,</u> or Transmission Service Provider provided steady-state, dynamics, and short circuit modeling data to its Transmission Planner(s) and Planning Coordinator(s), but failed to provide	The Balancing Authority, Generator Owner, Load Serving Entity, Resource Planner, <u>Transmission Owner,</u> or Transmission Service Provider did not provide any steady-state, dynamics, and short circuit modeling data to its Transmission Planner(s) and Planning Coordinator(s);

			than or equal to 25% of the required data specified in Attachment 1; OR The Balancing Authority, Generator Owner, Load Serving Entity, Resource Planner, Transmission Owner, or Transmission Service Provider provided steady-state, dynamics, and short circuit modeling data to its Transmission Planner(s) and Planning Coordinator(s), but less than or equal to 25% of the required data failed to meet data format, shareability, level of detail, or case type specifications; OR The Balancing Authority, Generator	greater than 25% but less than or equal to 50% of the required data specified in Attachment 1; OR The Balancing Authority, Generator Owner, Load Serving Entity, Resource Planner, Transmission Owner, or Transmission Service Provider provided steady-state, dynamics, and short circuit modeling data to its Transmission Planner(s) and Planning Coordinator(s), but greater than 25% but less than or equal to 50% of the required data failed to meet data format, shareability, level of detail, or case type specifications; OR	greater than 50% but less than or equal to 75% of the required data specified in Attachment 1; OR The Balancing Authority, Generator Owner, Load Serving Entity, Resource Planner, Transmission Owner, or Transmission Service Provider provided steady-state, dynamics, and short circuit modeling data to its Transmission Planner(s) and Planning Coordinator(s), but greater than 50% but less than or equal to 75% of the required data failed to meet data format, shareability, level of detail, or case type specifications; OR	OR The Balancing Authority, Generator Owner, Load Serving Entity, Resource Planner, Transmission Owner, or Transmission Service Provider provided steady-state, dynamics, and short circuit modeling data to its Transmission Planner(s) and Planning Coordinator(s), but failed to provide greater than 75% of the required data specified in Attachment 1; OR The Balancing Authority, Generator Owner, Load Serving Entity, Resource Planner, or Transmission Service Provider provided steady-state,

Owner, Load Serving Entity, Resource Planner, Transmission Owner, or Transmission Service Provider failed to provide steady-state, dynamics, and short circuit modeling data to its Transmission Planner(s) and Planning Coordinator(s) within the schedule specified by the data requirements and reporting procedures but did provide the data in less than or equal to 15 calendar days after the specified date.	The Balancing Authority, Generator Owner, Load Serving Entity, Resource Planner, Transmission Owner, or Transmission Service Provider failed to provide steady-state, dynamics, and short circuit modeling data to its Transmission Planner(s) and Planning Coordinator(s) within the schedule specified by the data requirements and reporting procedures but did provide the data in greater than 15 but less than or equal to 30 calendar days after the specified date.	The Balancing Authority, Generator Owner, Load Serving Entity, Resource Planner, Transmission Owner, or Transmission Service Provider failed to provide steady-state, dynamics, and short circuit modeling data to its Transmission Planner(s) and Planning Coordinator(s) within the schedule specified by the data requirements and reporting procedures but did provide the data in greater than 30 but less than or equal to 45 calendar days after the specified date.	dynamics, and short circuit modeling data to its Transmission Planner(s) and Planning Coordinator(s), but greater than 75% of the required data failed to meet data format, shareability, level of detail, or case type specifications; OR The Balancing Authority, Generator Owner, Load Serving Entity, Resource Planner, Transmission Owner, or Transmission Service Provider failed to provide steady-state, dynamics, and short circuit modeling data to its Transmission Planner(s) and Planning Coordinator(s) within the schedule specified by the data requirements and

						reporting procedures but did provide the data in greater than 45 calendar days after the specified date.
R~~3~~4	**Long-term Planning**	**Lower**	The Balancing Authority, Generator Owner, Load Serving Entity, Resource Planner, <u>Transmission Owner,</u> or Transmission Service Provider failed to provide a written response to its Transmission Planner(s) or Planning Coordinator(s) according to the specifications of Requirement R4 within ~~30~~<u>90</u> calendar days (or within a longer period agreed upon by the notifying Planning Coordinator or Transmission Planner), but did provide the response within ~~45~~ <u>105</u> calendar days (or within 15 calendar	The Balancing Authority, Generator Owner, Load Serving Entity, Resource Planner, <u>Transmission Owner,</u> or Transmission Service Provider failed to provide a written response to its Transmission Planner(s) or Planning Coordinator(s) according to the specifications of Requirement R4 within ~~30~~<u>90</u> calendar days (or within a longer period agreed upon by the notifying Planning Coordinator or Transmission Planner), but did provide the response within greater than ~~45~~<u>105</u> calendar days but less	The Balancing Authority, Generator Owner, Load Serving Entity, Resource Planner, <u>Transmission Owner,</u> or Transmission Service Provider failed to provide a written response to its Transmission Planner(s) or Planning Coordinator(s) according to the specifications of Requirement R4 within ~~30~~ <u>90</u> calendar days (or within a longer period agreed upon by the notifying Planning Coordinator or Transmission Planner), but did provide the response within greater than ~~60~~<u>120</u> calendar days but less	The Balancing Authority, Generator Owner, Load Serving Entity, Resource Planner, <u>Transmission Owner,</u> or Transmission Service Provider failed to provide a written response to its Transmission Planner(s) or Planning Coordinator(s) according to the specifications of Requirement R4 within ~~30~~ <u>135</u> calendar days (or within a longer period agreed upon by the notifying Planning Coordinator or Transmission Planner)<u>.</u>~~;~~ ~~OR~~ ~~The Balancing~~

			days after the longer period agreed upon by the notifying Planning Coordinator or Transmission Planner).	than or equal to ~~60~~ 120 calendar days (or within greater than 15 calendar days but less than or equal to 30 calendar days after the longer period agreed upon by the notifying Planning Coordinator or Transmission Planner).	than or equal to ~~75~~ 135 calendar days (or within greater than 30 calendar days but less than or equal to 45 calendar days after the longer period agreed upon by the notifying Planning Coordinator or Transmission Planner).	~~Authority, Generator Owner, Load Serving Entity, Resource Planner, or Transmission Service Provider did provide a written response to its Transmission Planner(s) or Planning Coordinator(s) according to the specifications of Requirement R4 but not within greater than 75 calendar days (or within greater than 45 calendar days after the longer period agreed upon by the notifying Planning Coordinator or Transmission Planner).~~
R~~5~~4	**Long-term Planning**	**Medium**	The Planning Coordinator ~~submitted~~ made available the required data to the ERO or its designee but failed to provide less than or equal to 25% of the required data in the format	The Planning Coordinator ~~submitted~~ made available the required data to the ERO or its designee but failed to provide greater than 25% or less than or equal to 50% of the required	The Planning Coordinator ~~submitted~~ made available the required data to the ERO or its designee but failed to provide greater than 50% or less than or equal to 75% of the required	The Planning Coordinator ~~submitted~~ available the required data to the ERO or its designee but failed to provide greater than 75% of the required data in the format specified by the ERO

				specified by the ERO or its designee.~~;~~ ~~OR~~ ~~The Planning Coordinator failed to provide the required data according to the schedule specified by the ERO or its designee but did provide the data within 15 calendar days after the specified date;~~ ~~OR~~ ~~The Planning Coordinator submitted the required data to the ERO or its designee but failed to include documentation and reasons for any data modifications.~~	data in the format specified by the ERO or its designee.~~;~~ ~~OR~~ ~~The Planning Coordinator failed to provide the required data according to the schedule specified by the ERO or its designee but did provide the data in greater than 15 calendar days but less than or equal to 30 calendar days after the specified date.~~	data in the format specified by the ERO or its designee.~~;~~ ~~OR~~ ~~The Planning Coordinator failed to provide the required data according to the schedule specified by the ERO or its designee but did provide the data in greater than 30 calendar days but less than or equal to 45 calendar days after the specified date.~~	or its designee.~~;~~ ~~OR~~ ~~The Planning Coordinator failed to provide the required data according to the schedule specified by the ERO or its designee and did not provide the data within 45 calendar days after the specified date.~~

D. Regional Variances

None.

E. Interpretations

None.

F. Associated Documents

None.

MOD-032-01 – ATTACHMENT 1:

"At a minimum" Data Reporting Requirements

The table, below, indicates the "at a minimum" information that is required to effectively model the interconnected transmission system for the Near-Term Transmission Planning Horizon and Long-Term Transmission Planning Horizon. Data must be shareable on an interconnection-wide basis to support use in the Interconnection-wide cases. A Planning Coordinator may specify additional information that includes specific information required for each item in the table below. Each functional entity[1] responsible for reporting the respective data in the table is identified by brackets "[functional entity]" adjacent to and following each data item. The data reported shall be as identified by the bus number, name, and/or identifier that is assigned in conjunction with the PC, TO, or TP.

steady-state *(Items marked with an asterisk indicate data that vary with system operating state or conditions. Those items may have different data provided for different modeling scenarios)*	dynamics *(If a user-written model(s) is submitted in place of a generic or library model, it must include the characteristics of the model, including block diagrams, values and names for all model parameters, and a list of all state variables)*	~~short-circuit~~short circuit

1. Each ~~B~~bus [TO]
  a. nominal voltage
  b. area, zone and owner
 2. Aggregate Demand ~~at each bus~~[2] [LSE]
  a. real and reactive power*
  b. in-service status*
  ~~c. load type (e.g., firm, interruptible, scalable, etc.)~~
 3. Generating Units[3] [GO, RP (for future planned resources only)]
  a. real power capabilities - gross maximum and minimum values
  b. reactive power capabilities - maximum and minimum values at real power capabilities in 3a above
	~~1.~~ Generator [GO, RP (for future planned resources only)]
	  ~~a. Synchronous machines, including, as appropriate to the model:~~
	  ~~i. inertia constant~~
	  ~~i. damping coefficient~~
	  ~~i. saturation parameters~~
	  ~~i. direct and quadrature axes reactances and time constants~~
	  ~~b. Other technologies, including, as appropriate to the model:~~
		1. Provide for all applicable elements in column "steady-state" [GO, RP, TO]
		  a. Positive Sequence Data
		  b. Negative Sequence Data
		  c. Zero Sequence Data
		 ~~1. provide for all applicable elements in column "steady-state" [GO, TO]~~
		 ~~2. Negative Sequence Data – provide for all applicable elements in column "steady-state" [GO, TO]~~

---

[1] For purposes of this attachment, the functional entity references are represented by abbreviations as follows: Balancing Authority (BA), Generator Owner (GO), Load Serving Entity (LSE), Planning Coordinator (PC), Resource Planner (RP), Transmission Owner (TO), ~~Transmission Operator (TOP),~~ Transmission Planner (TP), and Transmission Service Provider (TSP).

[2] For purposes of this item, aggregate Demand is the Demand aggregated at each bus under item 1 that is identified by a Transmission Owner as a load serving bus. An LSE is responsible for providing this information, generally through coordination with the Transmission Owner.

[3] Including synchronous condensers, and pumped storage, ~~etc~~.

steady-state *(Items marked with an asterisk indicate data that vary with system operating state or conditions. Those items may have different data provided for different modeling scenarios)*	dynamics *(If a user-written model(s) is submitted in place of a generic or library model, it must include the characteristics of the model, including block diagrams, values and names for all model parameters, and a list of all state variables)*	~~short circuit~~short circuit

c. station service auxiliary load for normal plant configuration (provide data in the same manner as that required for aggregate Demand under item 2, above).
~~d.~~ regulated bus* and voltage set point
~~e.~~d. ~~voltage set point~~* (as provided to the GO by the TOP)
~~f. owner(s) information (including percentage of ownership if jointly owned)~~
~~g.~~e. machine MVA base
~~h. share of reactive contribution for voltage regulation*~~
~~i.~~f. generator step up transformer data (provide same data as that required for transformer under item 6, below)
g. generator ~~prime mover and fuel~~ type (hydro, wind, fossil, solar, nuclear, etc)
~~j.~~h. in-service status*
4. AC Transmission Line or Circuit ~~(series capacitors and reactors shall be explicitly modeled as individual line segments)~~ [TO]
  a. impedance parameters (positive sequence)
  ~~i. resistance~~
  ~~ii. reactance~~
  ~~iii.~~b. susceptance (line charging)
  ~~b.~~c. ratings (normal and emergency)*
~~c. equipment~~ in-service status*
  d.
5. DC Transmission systems [TO] ~~– identified by DC line name or number [TO]~~
~~a. AC bus number and name for each converter~~
~~b. line parameters~~
~~c. ratings~~
~~d.~~5. rectifier and inverter data
6. Transformer (voltage and phase-shifting) [TO]
  a. nominal voltages of windings
  b. impedance(s)
  c. tap ratios (voltage or phase angle)*
	~~i. inertia constant~~
	~~i. damping coefficient~~
	~~i. saturation parameters~~
	~~iv.~~1. direct and quadrature axes reactances and time constants
	2. Excitation System [GO, RP(for future planned resources only)]
	3. Governor [GO, RP(for future planned resources only)]
	4. Power System Stabilizer [GO, RP(for future planned resources only)]
	5. Demand [LSE] ~~(consistent with system load representation (composite load model) and components as a function of frequency and voltage)~~
	6. Wind Turbine Data [GO]
	7. Photovoltaic systems [GO]
	8. Static Var Systems and FACTS [GO, TO, LSE]
	9. DC system models [TO]
	~~9.~~10. Other information requested by the Planning Coordinator or Transmission Planner necessary for modeling purposes. [BA, GO, LSE, TO, TSP]
		~~3. Zero Sequence Data – provide for all applicable elements in column "steady-state" [GO,TO]~~
		~~a. Bus~~
		~~b. Generator~~
		~~c. Transmission line~~
		~~d. Transformer (to include connection type)~~
		2. Mutual Line Impedance Data [TO]
		3. Other information requested by the Planning Coordinator or Transmission Planner necessary for modeling purposes. [BA, GO, LSE, TO, TSP]
		~~4.~~

steady-state *(Items marked with an asterisk indicate data that vary with system operating state or conditions. Those items may have different data provided for different modeling scenarios)*	dynamics *(If a user-written model(s) is submitted in place of a generic or library model, it must include the characteristics of the model, including block diagrams, values and names for all model parameters, and a list of all state variables)*	~~short circuit~~short circuit

d. minimum and maximum tap position limits
e. number of tap positions (for both the ULTC and NLTC)
f. regulated bus (for voltage regulating transformers)*
~~g. regulated voltage limits or MW band limits*~~
g. ratings (normal and emergency)*
h. in-service status*
~~h.~~
7. Reactive compensation (shunt capacitors and reactors) [TO]
   a. admittances (MVars) of each capacitor and reactor
   b. regulated voltage band limits
   c. mode of operation (fixed, discrete, continuous, etc.)
   d. regulated bus*
   e. in-service status*
   ~~d.~~
   ~~e. share of reactive contribution for voltage regulation*~~
8. Static Var Systems [TO]
   a. reactive limits
   b. voltage set point*
   c. fixed/switched shunt ~~switching~~, if applicable
   d. in-service status*
   ~~c.~~
   ~~d. share of reactive contribution for voltage regulation*~~
9. Other information requested by the Planning Coordinator or Transmission Planner necessary for modeling purposes. [BA, GO, LSE, TO, TSP]		

Formatted Table

Application Guidelines

Guidelines and Technical Basis

If a Transmission Planner (TP) and Planning Coordinator (PC) mutually agree, a ~~Transmission Planner~~TP may collect and aggregate some or all data from providing entities, and the ~~Transmission Planner~~TP may then provide that data directly to the ~~Planning Coordinator~~PC(s) on behalf of the providing entities. The submitting entities are responsible for getting the data to both the TP and the PC, but nothing precludes them from arriving at mutual agreements for them to provide it to the TP, who then provides it to the PC. Such agreement does not relieve the submitting entity from responsibility under the standard, nor does it make the consolidating entity liable for the submitting entities' compliance under the standard (in essence, nothing precludes parties from agreeing to consolidate or act as a conduit to pass the data, and it is in fact encouraged in certain circumstances, but the requirement is aimed at the act of submitting the data). Notably, there is no requirement for the TP to provide data to the PC. The intent, in part, is to address potential concerns from entities that they would otherwise be responsible for the quality, nature, and sufficiency of the data provided by other entities.

The requirement in Part 1.3 to include specifications for distribution or posting of the data requirements and reporting procedures could be accomplished in many ways, to include posting on a Web site, distributing directly, or through other methods that the Planning Coordinator and each of its Transmission Planners develop.

An entity submitting data per the requirements of this standard who needs to determine the PC for the area, as a starting point, should contact the local Transmission Owner (TO) for information on the TO's PC. Typically, the PC will be the same for both the local TO and those entities connected to the TO's system. If this is not the case, the local TO's PC can typically provide contact information on other PCs in the area. If the entity (e.g., a Generator Owner [GO]) is requesting ~~interconnection for~~connection of a new generator, the entity can determine who the PC is for that area at the time a generator ~~interconnection~~ connection request is submitted. Often the TO and PC are the same entity, or the TO can provide information on contacting the PC. The entity should specify as the reason for the request to the TO that the entity needs to provide data to the PC according to this standard. Nothing in the proposed requirement language of this standard is intended to preclude coordination between entities such that one entity, serving only as a conduit, provides the other entity's data to the PC. This can be accomplished if it is mutually agreeable by, for example, the GO (or other entity), TP, and the PC. This does not, however, relieve the original from its obligations under the standard to provide data, nor does it pass on the compliance obligation of the entity. The original entity is still accountable for making sure that the data has been provided to the PC according to the requirements of this standard.

The standard language recognizes that differences exist among the ~~three i~~Interconnections ~~(Eastern, ERCOT and WECC)~~. Presently, the Eastern/Quebec and Texas Interconnections ~~on an annual basis~~ build seasonal cases on an annual basis, while the ~~WECC~~ Western Interconnection builds cases on a continuous basis throughout the year. The intent of the standard is not to change established processes and procedures in each of the Interconnections, but to create a framework to support both what is already in place or what it may transition into in the future,

Application Guidelines

and to provide further guidance in a common platform for the collection of data that is necessary for the building of the Interconnection-wide case model(s).

The construct that these standards replace did not specifically list which Functional Entities were required to provide specific data. Attachment 1 specifically identifies the entities responsible for the data required for the building of the Interconnection-wide case model(s).