NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

White Paper on the MOD C Standards

MOD-016, MOD-017, MOD-018, MOD-019, and MOD-021

July 18, 2013

RELIABILITY | ACCOUNTABILITY

3353 Peachtree Road NE
Suite 600, North Tower
Atlanta, GA 30326
404-446-2560 | www.nerc.com

Table of Contents

Executive Summary

NERC Reliability Standards MOD-016, -017, -018, -019, and -021 (referred to herein as the "MOD C" standards), were approved in the Federal Energy Regulatory Commission's ("FERC" or "Commission") Order No. 693. Collectively, the MOD C standards pertain to the collection of data necessary to analyze the resource needs to serve peak demand while maintaining a sufficient margin to address operating events as follows:

- MOD-016-1.1 is the umbrella standard that contains the documentation required for the data collection requirements.
- MOD-017-0.1 provides for the data requirements for actual and forecast peak demand and net energy for load.
- MOD-018-0 provides for the treatment of nonmember demand data and how uncertainties are addressed in the forecasts of demand and net energy for load.
- MOD-019-0.1 provides for the collection of interruptible demands and direct control load management.
- MOD-020-0 addresses the need to provide interruptible demands and direct control load management data to System Operators and Reliability Coordinators.
- MOD-021-1 provides for the documentation of how Demand-Side Management demands are accounted for in demand and energy forecasts.

NERC initiated an informal development process to address directives in Order No. 693 to modify certain aspects of the MOD C standards. The first informal meeting was held in February 2013 at NERC's Washington, D.C. office. Participants were industry subject matter experts (SMEs), NERC staff, and staff from FERC's Office of Electric Regulation. The small ad hoc group of SMEs participated in discussions about the outstanding FERC directives and possible resolutions to address the directives. The group also discussed the six standards (MOD-016 through MOD-021) and identified issues with the present standards. The group very quickly identified MOD-020 as dealing with the operational time frame and concluded that it should not be addressed with the other standards at this time since they were applicable to the planning horizon.

Although a pure data reporting standard would be a candidate for retirement under Paragraph 81, the data being collected has a reliability purpose in the development of future assessments for resource adequacy. It was decided to present a pro forma standard that consolidates the remaining five MOD C standards into a single standard, which was supported as the group conducted informal development outreach. Creating a single standard provides a means of ensuring data will be collected and shared among the necessary parties (LSEs, BAs, TPs, etc.) in both the United States and Canada.

As detailed below, the MOD C informal ad hoc group discussed the outstanding directives from FERC Order No. 693 and, through the informal development, provided a resolution to address each one.

Purpose

The purpose of this white paper is to provide background and technical rationale for the proposed revisions to the group of approved MOD standards that have a common mission of collecting data used in the analysis of resource needs. This document outlines the next generation of these standards and proposes to combine the reliability components of this package of standards into one standard. The remaining requirements in this package would either be retired as administrative or captured as instructional or explanatory in a white paper.

This white paper lays out a common understanding of industry perspectives on topics included in these standards. It further provides an explanation of how NERC is addressing each of the outstanding FERC directives assigned to these FERC-approved standards. This paper will also provide technical justifications and support for the proposed requirements that are retained and placed into the pro forma standard. The contents of this paper are intended to assist the standard drafting team (SDT) assigned to MOD C and industry stakeholder participants with background information to move this standard package through the formal development process. Eventually, following industry and the NERC Board of Trustees' adoption of the proposed standard, this white paper will be used to support the filing to the applicable regulatory authorities.

Technical Discussion

The fundamental test for determining the adequacy of the bulk power system (BPS) is to determine the amount of resources and the certainty of these resources to be available to serve peak demand while maintaining a sufficient margin to address operating events. This test requires the collection and aggregation of demand forecasts on a normalized basis. This is defined as a forecast that has been adjusted to reflect normal weather conditions and is expected on a 50 percent probability basis, also known as a 50/50 forecast (i.e., there is a 50 percent probability that the actual peak realized will be either under or over the projected peak). This forecast can then be used to test against more extreme conditions.

The collection of demand projections requires coordination and collaboration between Planning Authorities/Planning Coordinators, Transmission and Resource Planners, and Load-Serving Entities. Ensuring that planners and operators have access to complete and accurate load forecasts—as well as the supporting methods and assumptions used to develop these forecasts—will ultimately enhance the reliability of the BPS. Consistent documenting and information-sharing activities will also improve the efficiency of planning practices and support the identification of needed system reinforcements. Furthermore, collection of actual demand and Demand-Side Management performance during the prior year will allow for comparison to prior forecasts and further contribute to enhanced accuracy of load forecasting practices.

The ad hoc group identified two options to address MOD-016 through MOD-019 and MOD-021. The first option was to retire the five standards and include the data being collected in the *Long-Term Reliability Assessment* (LTRA). The second option was to combine the five standards into a single standard with three or four clear requirements.

Initially, the ad-hoc group suggested tying the standard to the LTRA. Currently, the majority of LTRA data is required for the completion of the Form EIA-411, administered by the Energy Information Administration (EIA). Accordingly, failure by the Regional Entities to provide this data to NERC on an annual basis is in violation of federal law. In the absence of a standard however, NERC has no ability to directly address an entity that fails to provide requested LTRA data. This especially applies for Canadian provinces that do not provide data for the Form EIA-411.

A second alternative to addressing data requirements in the absence of a standard is the implementation of either a Section 800 or Section 1600 data request. This approach, while effective, has a number of disadvantages. First, some Canadian provinces are not subject to FERC rule, which makes it more difficult for NERC to enforce an 800 or 1600 data request. The second issue is with entities within the continental United States. The 800 or 1600 data request is not mandatory and does not provide a mechanism to compel participation other than pursuing federal action under Section 215 of the Federal Power Act. In addition, using either of these approaches does not provide a mechanism for other LSEs, DPs, BAs or TPs to obtain the data from a neighboring entity.

The recommended option of modifying the existing standards to remove the ambiguity and address the FERC directives solves the issues identified with the first two options. Creating a single standard provides a means of ensuring data will be collected and shared among the necessary parties (LSEs, BAs, TPs, etc.) in both the United States and Canada. The informal development effort resulted in the recommendation for the development of a standard and has provided a draft version that combines the five existing standards into a single, comprehensive, and clear standard with three requirements.

Outstanding FERC Directives

There are 11 outstanding FERC directives from Order 693. Each of the directives was discussed in detail during the informal development stage, and summaries of the discussions can be found below. The ad hoc group extensively reviewed each of the directives with consideration of where the existing standards are today, where the group landed with the pro forma standard following its extensive industry outreach, and how the group addressed each directive.

The "Paragraph 81 initiative," which was issued by FERC in their March 15, 2012,[1] invited the ERO to identify possible requirements that have little to no effect on reliability that could be removed from the NERC Reliability Standards. The ad hoc group took the information from the FERC order into consideration when it discussed the directives related to the MOD C initiative.

Para 1232

Supported by many commenters, **the Commission directs the ERO to modify MOD-016-1 and expand the applicability section to include the transmission planner, on the basis that under the NERC Functional Model the transmission planner is responsible for collecting system modeling data, including actual and forecast load, to evaluate transmission expansion plans**. We disagree with EEI that this Reliability Standard should not be applied to the transmission planner because load-related data for controllable DSM is not only needed for distribution and transmission operations, but is also necessary for the transmission planner to take controllable DSM into account in planning the transmission system. Requirement R1.1 relates to data submittal, and requires data to be consistent with that supplied for the TPL-005 and TPL-006 standards, which clearly apply to transmission planners. We approve the ERO's definition in the glossary of DSM as "all activities or programs undertaken by a Load-Serving Entity or its customers to influence the amount or timing of electricity they use." Only activities or programs that meet the ERO definition, with the modification directed below, may be treated as DSM for purposes of the Reliability Standards. Recognizing the potential role that industrial customers who do not take service through an LSE and load aggregators, for example, may play in meeting the Reliability Standards, we direct the ERO to modify the definition of DSM. **Specifically, we direct the ERO to add to its definition of DSM "any other entities" that undertake activities or programs to influence the amount or timing of electricity they use without violating other Reliability Standard Requirement.**

Consideration of Directive

With regard to the first directive, the ad hoc group is recommending that the Transmission Planner be added to the Applicability Section of the proposed standard MOD-031-1 Demand Data Reporting.

Regarding the second directive, the ad hoc group is proposing a modified definition for Demand-Side Management (DSM). However, the group felt that the FERC proposed definition needed further clarity, so they modified it in an equally effective and efficient manner. It now reads:

> **Demand-Side Management:** The term for all activities or programs undertaken by any applicable entity to influence the amount or timing of electricity they use.

Para 1249

The Commission also directs the ERO to modify the Reliability Standard to require reporting of temperature and humidity along with peak load because actual load must be weather normalized for meaningful comparison with forecasted values. In response to MidAmerican's observation that it sees little value in collecting this data, we believe that collecting it will allow all load data to be weather-normalized, which will provide greater confidence when comparing data accuracy, which ultimately will enhance reliability. As a result, we reject Xcel's proposal that the standard be revised to include only the generic term "peak producing weather conditions" because it is too generic for a mandatory Reliability Standard.

[1] http://www.nerc.com/files/OrderConditionallyAcceptingNewEnfocementMechFiling_031512.pdf

Consideration of Directive

The informal ad hoc group developed Requirement R1 of the proposed standard MOD-031-1 Demand Data Reporting. Requirement R1 now requires weather-normalized actual demand data to be reported (Requirement R1 part 1.4.3). The requirement now states that an entity must provide an explanation of how it used temperature and humidity to weather normalize its actual demands (Requirement R1 part 1.7.4).

Para 1250

We also reject Alcoa's proposal that the reporting of temperature and humidity along with peak loads should apply only to load that varies with temperature and humidity because it essentially is a request for an exemption from the requirements of the Reliability Standard and should therefore be directed to the ERO as part of the Reliability Standards development process. We agree, however, with APPA that certain types of load are not sensitive to temperature and humidity. **We therefore find that the ERO should address Alcoa's concerns in its Reliability Standards development process.**

Consideration of Directive

The informal ad hoc group discussed this issue at length and decided that there should not be an exemption. The group believes that if the load is not weather-sensitive then an explanation will be provided (Requirement R1 part 1.7.4), which will accomplish the same objective as providing an exemption.

Para 1251

The Commission adopts the NOPR proposal directing the ERO to modify the Reliability Standard to require reporting of the accuracy, error and bias of load forecasts compared to actual loads with due regard to temperature and humidity variations. This requirement will measure the closeness of the load forecast to the actual value. We understand that load forecasting is a primary factor in achieving Reliable Operation. Underestimating load growth can result in insufficient or inadequate generation and transmission facilities, causing unreliability in real-time operations. Measuring the accuracy, error and bias of load forecasts is important information for system planners to include in their studies, and also improves load forecasts themselves.

Consideration of Directive

The informal ad hoc group developed Requirement R1 of the proposed standard MOD-031-1 Demand Data Reporting. The requirement now states that an entity must provide an explanation of how the actual and forecast demand compared (Requirement R1 part 1.7.4).

Para 1252

The Commission agrees with APPA that accuracy, error and bias of load forecasts alone will not increase the reliability of load forecasts, and, as a result, will not affect system reliability. Understanding of the differences without action based on that understanding would not change anything. Therefore, **we direct the ERO to add a Requirement that addresses correcting forecasts based on prior inaccuracies, errors and bias.**

Consideration of Directive

The informal ad hoc group developed Requirement R1 of the proposed standard MOD-031-1 Demand Data Reporting. The requirement now states that an entity must provide an explanation of how the assumptions and methods for future forecasts were adjusted (Requirement R1 part 1.7.4).

Para 1255

We agree with FirstEnergy that transmission planners should be added as reporting entities, and direct the ERO to modify the standard accordingly. We agree that in the NERC Functional Model, the transmission planner is responsible for collecting system modeling data including actual and forecast demands to evaluate transmission expansion plans.

Consideration of Directive

The informal ad hoc group, as a result of its informal outreach, is recommending that the Transmission Planner be added to the Applicability Section of the proposed standard MOD-031-1 Demand Data Reporting.

Para 1256

The Commission disagrees in general with MISO's recommendation to allow some exceptions to the requirement to provide hourly demand data. However, the metering for some customer classes may not be designed to provide certain types of data. **The Commission therefore directs the ERO to consider MISO's concerns in the Reliability Standards development process.**

Consideration of Directive

The informal ad hoc group discussed this issue at length with industry participants during informal outreach and decided that there should not be an exemption. The group believes that all load data should be reported to accurately model the Bulk Power System.

Para 1265

Regarding TAPS's concern that small entities should not be required to comply with MOD-018-0 because their forecasts are not significant for system reliability purposes, **the Commission directs the ERO to address this matter in the Reliability Standards development process.**

Consideration of Directive

The informal ad hoc group discussed this issue at length during its outreach and concluded that there should not be an exemption. The group believes that all load data should be reported to accurately model the Bulk Power System.

Para 1276

The Commission adopts the NOPR proposal directing the ERO to modify this standard to require reporting of the accuracy, error and bias of controllable load forecasts. This requirement will enable planners to get a more reliable picture of the amount of controllable load that is actually available, therefore allowing planners to conduct more accurate system reliability assessments. The Commission finds that controllable load can be as reliable as other resources, and therefore should also be subject to the same reporting requirements. Although we recognize that verifying load control devices and interruptible loads may be complex, we do not believe that it is overly so. **Further, we believe that the ERO, through its Reliability Standards development process can develop innovative solutions to the Commission's concern.** We also note that EEI is concerned about such testing at times of peak load. We clarify that we are not requiring the testing to be conducted at peak load conditions. Consequently, we reject the proposals of EEI, FirstEnergy and International Transmission to discard the requirement for reporting of the accuracy, error and bias of controllable load forecasts.

Consideration of Directive

The SDT developed Requirement R1 of the proposed standard MOD-031-1 Demand Data Reporting. The requirement now states that an entity must provide an explanation of how the assumptions and methods for future forecasts were adjusted (Requirement R1 part 1.7.4).

Para 1277

We direct the ERO to include APPA's proposal in the Reliability Standards development process to add a new requirement to MOD-019-0 that would oblige resource planners to analyze differences between actual and forecasted demands for the five years of actual controllable load and identify what corrective actions should be taken to improve controllable load forecasting for the 10-year planning horizon.

Consideration of Directive

The informal ad hoc group developed Requirement R1 of the proposed standard MOD-031-1 Demand Data Reporting. The requirement now states that an entity must provide an explanation of how the assumptions and methods for future forecasts were adjusted (Requirement R1 part 1.7.4).

Para 1298

We agree with FirstEnergy and SMA that standardization of principles on reporting and validating DSM program information will provide consistent and uniform evaluation of demand response to facilitate system operator confidence in relying on such resources, which will further increase accuracy of transmission system reliability assessment and

consequently enhance overall reliability. We direct the ERO to modify this Reliability Standard to allow resource planners to analyze the causes of differences between actual and forecasted demands, and to identify any corrective actions that should be taken to improve forecasted demand responses for future forecasts. **Therefore, we adopt the NOPR proposal and direct the ERO to modify MOD-021-0 by adding a requirement for standardization of principles on reporting and validating DSM program information.**

Consideration of Directive

The informal ad hoc group developed Requirement R1 of the proposed standard MOD-031-1 Demand Data Reporting. The requirement now states that an entity must provide an explanation of how DSM is forecasted and adjusted for errors (Requirement R1 part 1.7.3).

Conclusion

In developing the MOD C initiative, the informal ad hoc group and entities that participated in informal development discussed the key reliability impacts of the existing MOD C NERC Reliability Standards. The group identified and discussed issues at varying lengths early in the process and decided to consolidate the existing five standards into one pro forma standard. The approach is intended to maintain NERC's focus on developing and retaining requirements that support the reliable operation of the Bulk Power System.

This white paper provides a record of how the ad hoc group and industry participants in the informal development decided to address the outstanding directives from FERC Order 693, along with the other components of the results-based standards, such as a risk-based and performance-based standard, along with incorporating the Paragraph 81 initiative.

Appendix A: Entity Participants

The below entities represent a nonexhaustive list of entities that had personnel that participated in the MOD-C informal development effort in some manner, which may include one of the following: direct participation on the ad hoc group, inclusion on the wider distribution (the "plus") list, attendance at workshops or other technical discussions, or by providing feedback to the group through a variety of methods (e.g., email, phone calls, etc.). Additionally, though not listed here, announcements were distributed to wider NERC distribution lists to provide the opportunity for entities that were not actively participating to join the effort.

Table 1: Entity Participation in MOD C Informal Development				
Austin Energy	Hydro Quebec	MISO	PG&E	PSEG
American Transmission Co.	MEAG Power	NI Source	PJM	XCEL Energy
CenterPoint Energy	Flathead Coop	FERC	PSEG	MidAmerican
ERCOT				
Regional Entities				
FRCC				
MRO				
NPCC				
RFC				
SERC				
SPP				
TRE				
WECC				

Table 2: Presentations and Events	
NERC News	NERC Standards and Compliance Workshop
NERC Operating Committee	Reliability Assessment Subcommittee
NERC Planning Committee	Reliability Assessment Data Working Group
NERC Standards Committee	