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Initial Standard Review and Analysis Report
For
NERC Standard 600
Determine Facility Ratings, System Operating Limits, and Transfer Capabilities

NAESB WEQ Executive Committee
Standards Review Subcommittee
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Introduction

This document provides an initial review of the proposed NERC Standard 600 entitled "Determine Facility Ratings, System Operating Limits and Transfer Capabilities" in an effort to determine whether there is a need for companion business practice standards. This initial review does not constitute, but may result in, a proposed recommendation by the Standards Review Subcommittee to develop or propose a NAESB Standard.

Purpose and Status of NERC Standard 600

The stated purpose of Standard 600 is to determine facility ratings, system operating limits, and transfer capabilities necessary to plan and operate the bulk electric system within predefined facility and operating limits such that cascading outages, uncontrolled system separation, and voltage and transient instability are avoided. The standard is intended to apply to entities defined in the NERC functional model, but until such entities are certified, the standards will apply to existing entities effective upon adoption by the NERC Board of Trustees.

This document reviews Draft Standard Version 1 posted for comment from July 1, 2003 to August 29, 2003. Prior to the posting of the draft standard, four versions of a draft Standards Authorization Request were posted, with comment periods ranging from April 2, 2002 to January 31, 2003.

Actions Required Within the Standard

The standard is subdivided into six requirements and associated measures, two for each of the three components identified in the title to the standard. The first requirement is the development and availability of a methodology, and the second is the application of the defined methodology to determine and communicate the necessary values to those entities performing the reliability authority, planning authority, and transmission operator functions (i.e., the users). This results in the following standard requirements:

Facility Ratings	601	Transmission and generator owners document the methodology used to rate their facilities, identifying any assumptions and referencing industry rating practices or other standards.
	602	Transmission and generator owners establish their facility ratings based on the defined methodology, and communicate these to the user on a schedule established by that user.

System Operating Limits	603	The reliability authority, planning authority, and transmission operators document the methodology to determine the operating limits that do not violate applicable facility ratings, and that avoid system performance outside pre-defined normal and contingency conditions. The methodology must address applicable contingencies, accuracy and level of detail of system models, SPSs or remedial action plans, transmission system configuration, generation dispatch and load level, and any reliability margins. (Of note is the inclusion of regional differences for NPCC consisting of pre-defined conditions for loss of multiple elements.)
	604	The responsible entities establish their system operating limits based on the defined methodology, and communicate these to the transmission service providers and transmission operators on a schedule established by those users.
Transfer Capabilities	605	The reliability and planning authorities document the methodology used to determine transfer capabilities that adhere to system operating limits with reference to transmission system topology, system demand, generation dispatch, current and projected transmission uses, and applicable reliability margins.
	606	The responsible entities establish their transfer capabilities based on the defined methodology, and communicate them, as requested, to NERC and its Regions, reliability authorities, transmission service providers, planning authorities, and transmission operators on a schedule established by each.

Items for Consideration for a Companion Business Practice Standard

NERC's standard focuses on requirements that entities establish facility ratings and does not specify how or what methodology entities will employ to rate facilities. NAESB could consider establishing standard methodologies for ratings.

- Develop a standard methodology to rate transmission and/or generator facilities. At a minimum, such a standard could identify a minimum level of acceptable assumptions and relevant industry rating practices.
- Define standard formats and protocols for communication of facility ratings, operating limits and transfer capability.
- Develop a standard methodology for determining system operating limits. The NERC standard requires only that the methodology by which system operating limits are calculated be documented and made available to the compliance monitor, the Reliability Authority and the Planning Authority. In addition, the system operating limits must be made available to transmission service providers, presumably so they can provide transmission service up to the defined limit. The NERC standard does **not** require:
  - The publication, to the market, of the methodology used including an identification of the assumptions used for elements such as generator dispatch and reliability margins. The assumptions used could have significant commercial impacts.

  - The development of a standard methodology to determine what portion of the operating limit is being used at any point in time.
  - How the transmission service provider determines the remaining available capability.
- Footnotes to Table 1 of the Draft NERC Standard defining normal and contingency conditions permit system adjustments, includes "curtailments of contracted firm (non-recallable reserved) electric power transfers" to prepare for the next contingency. The methodology to undertake such curtailments should be defined in a business practice standard, as a companion to this reliability standard or in conjunction with another reliability standard.
- Develop a standard methodology to determine transfer capabilities. The transfer capability is defined as "the measure of the ability to move electric power from one area to another over all transmission lines between those areas under specified system conditions". This definition requires that the adjacent areas coordinate the calculation of the transfer capability, and define and agree on a methodology to incorporate simultaneous transfers. In the event transfers may occur over several lines, a standard methodology to calculate and assess simultaneous transfer feasibility may be required. The NERC standard requires only that the methodology by which transfer capabilities are calculated be documented and made available to the compliance monitor, the Reliability Authority and the Planning Authority. The assumptions used could have significant commercial impacts.

Discussion Issues for Consideration

The SRS identified some concerns regarding development of a NAESB Business Practice Standard to complement the NERC standard.

- What level of standardization is possible given the diverse regional and market methodologies and requirements employed today?
- What level of "granularity" (i.e.- general/broad requirements in a methodology) could a business practice standard be possible?
- What information (ratings) should be provided to the marketplace?
  - How and when should such information be communicated?
- What added value would such a standard provide to the market participants?
- Should NAESB set the numerical levels for ATC?