Mr. Henry Masti, Chair - Reliability Coordinating Committee
Members, Reliability Coordinating Committee

Re: TFCP Guidance for Transmission Design Studies

TFCP prepared the attached document upon the request of Dave Conroy, from the Central Maine Power Company, who is involved in a regulatory proceeding on a transmission reinforcement project. This TFCP guidance document provides a compilation of NPCC criteria and NERC standards which reference study conditions to be assumed when conducting Transmission Design Studies. TFSS concurs with the TFCP guidance provided, and we are seeking RCC acceptance of this document.

Very truly yours,

John Sabiston

John Sabiston
Chair of the Task Force on Coordination of Planning

Attachment – “TFCP Guidance for Transmission Design Studies regarding the application of Criteria & Reliability Standards”

cc: TFCP, Task Force on Coordination of Planning
TFSS, Task Force on System Studies
TFCP Guidance for Transmission Design Studies regarding the application of Criteria & Reliability Standards

Within NPCC, criteria document A-2 provides the design criteria to be followed for system design. The criteria within the NPCC document are consistent with NERC Planning criteria contained in the NERC TPL Reliability Standards, TPL-001-0.1, TPL-002a and TPL-003a. The following are excerpts from NPCC A-2 and the NERC TPL Reliability Standards that provide guidance to the Planning Coordinators and Transmission Planners within NPCC for the appropriate system conditions to be modeled for transmission system design studies.

NPCC Basic Criteria references

Below are excerpts from NPCC Basic Criteria (Document A-2) which indicate testing assumptions required to meet the NPCC criteria.

§2.1 “Design studies shall assume power flow conditions utilizing transfers, load and generation conditions which stress the system.”

§5.0 “The portion of the bulk power system in each Area and of each member system shall be designed with sufficient transmission capability to serve forecasted loads under the conditions noted in Sections 5.1 and 5.2.”

§5.0 “Anticipated transfers of power from one Area to another, as well as within Areas, shall be considered in the design of inter-Area and intra-Area transmission facilities.”

§5.0 “These criteria will also apply after any critical generator, transmission circuit, transformer, series or shunt compensating device or HVdc pole has already been lost, assuming that the Area generation and power flows are adjusted between outages by the use of ten-minute reserve and where available, phase angle regulator control and HVdc control.”

§5.2a “Each Area shall design its system in accordance with these criteria and its own voltage control procedures and criteria, and coordinate these with adjacent Areas and control areas.”

NERC TPL Reliability Standard references

Below are excerpts from NERC TPL Reliability Standards (TPL-001-0.1, TPL-002a, and TPL-003a) which indicate testing assumptions required to meet the reliability standards.

R1 “…its portion of the interconnected transmission system is planned such that the Network can be operated to supply projected customer demands and projected
Firm (non-recallable reserved) Transmission Services, at all demand levels over the range of forecast system demands…” (TPL-001 & TPL-002 & TPL-003)

R1.3.1 “Be performed and evaluated only for those…contingencies that would produce the more severe System results or impacts.” (TPL-002 & TPL-003)

R1.3.2 “Cover critical system conditions and study years…..” (TPL-002 & TPL-003, and TPL-001 as R1.3.1)

R1.3.5 “Have all projected firm transfers modeled.” (TPL-001 & TPL-002 & TPL-003)

Appendix 1 “a Planning Coordinator would formulate critical system conditions that may involve a range of critical generator unit outages as part of the possible generator dispatch scenarios.” (TPL-002 & TPL-003)

**Transmission Design Study Assumptions consistent with criteria and standards**

**Dispatch:**
Using a variety of base case dispatch conditions with more than a single generator off-line is a proper application of NPCC criteria specifications to model “conditions which stress the system” and of NERC standard specification of “a range of critical generator unit outages as part of the possible generator dispatch scenarios.”

**Transfers:**
Modeling several transfer conditions which include firm transfer capability or Total Transfer Capability in both directions, is a proper application of NPCC criteria specifications to model “conditions which stress the system” and the NPCC requirement to consider “anticipated transfers of power from one Area to another, as well as within Areas”; and the NERC standard specification to “have all projected firm transfers modeled.”

**Operating adjustments for N-1-1:**
NPCC criteria require coordination between Areas in making assumptions regarding adjacent area’s procedures and criteria, and the areas’ ability to make such system adjustments within 10 minutes. For example, use of an assumption of 700 MW ramp-down of the New Brunswick-New England interconnection flows within 10 minutes by the New Brunswick System Operator, without any coordination between ISO New England and New Brunswick personnel is not consistent with NPCC criteria specifications to “coordinate these with adjacent Areas and control areas.”

**Load Level:**
Contingency analysis should be conducted at system peak load, and other load levels if they represent more stressed system conditions. This is a proper application of NPCC criteria
Specifications to model “conditions which stress the system” and NERC standard specification to plan the system “at all demand levels over the range of forecast system demands.”

Compiled by the NPCC Task Force on Coordination of Planning (TFCP)
October 28, 2009