

1.0 Overview

The purpose of this document is to outline the basic criteria, assumptions and data that underlie the NL Transmission Planning Process for the Newfoundland and Labrador Interconnected System. The *NL Transmission Planning Guidelines* will be made available to stakeholders in the transmission planning section of the NLSO's OASIS. These guidelines include: the criteria used for analysis of the NL Transmission System, including power flow, stability, short-circuit, and voltage collapse analyses; adherence to NL reliability standards; treatment of NL Native load; transmission contingencies and measurements; thermal and voltage limits; and modeling considerations. Where there are applicable planning criteria that exist in other documents, care has been taken not to reproduce those criteria in this document, but to reference the documents in which it appears. Referenced documents will also be made available on the NLSO's OASIS.

This document is not intended to describe the NL Transmission Planning Process. The NL Transmission Planning Process is defined in its own document titled *NL Transmission Planning Process*, available on the NLSO's OASIS website.

Capitalized terms in this document, if not defined in Section 2.0 of this document, are defined in Section 2.0 of the *NL Transmission Policies and Procedures*.

2.0 Definitions

Dynamic Stability: In a system of two or more synchronous machines connected through an electric network, the condition in which the difference of the angular positions of the rotors of the machines either remains constant while not subjected to a disturbance, or becomes constant following an aperiodic disturbance. (IEEE Standard Dictionary of Electrical and Electronics Terms – IEEE Std. 100-1992)

NL Native Load: Those entities, including both retail and wholesale customers, on whose behalf NLH, by statute, franchise or contract, has undertaken the obligation to plan, construct, and operate its system to provide Reliable delivery of Energy and Ancillary Services.

Newfoundland and Labrador Interconnected System: The transmission facilities located within Newfoundland and Labrador operating at a voltage level of 46 kV and above. It includes the NL Transmission System and the NL Sub-Transmission System.

Short Circuit: An abnormal connection (including an arc) of relatively low impedance, whether made accidentally or intentionally, between two points of different potential. *Note:* The term **fault** or short-circuit **fault** is used to describe a short circuit.

Steady State Stability: The capability of an electric power system to maintain its initial condition after a small interruption or to reach a condition very close to the initial one when the disturbance is still present.

Transmission Plan: A report identifying a collection of projects reflecting committed and scheduled investments in transmission facilities and transmission system expansion plans, new or modified facilities approved by the transmission provider, and investments in transmission facilities required to maintain the reliability of the Newfoundland and Labrador Interconnected System.

Voltage Collapse: Occurs when the reactive power demand of load is not being met due to a shortage in reactive power production and transmission.

3.0 Roles and Responsibilities

The NLSO's Transmission Planning group is responsible for developing and maintaining the *NL Transmission Planning Guidelines*.

4.0 Criteria for Analysis

4.1. Steady State Stability

The NLSO's transmission planning document titled *Transmission Planning Criteria* defines the analysis criteria for steady state voltage and performance requirements.

4.2. Dynamic Stability

The NLSO's transmission planning document titled *Transmission Planning Criteria* defines the analysis criteria for dynamic stability voltage and performance requirements.

4.3. Short Circuit

The NLSO's transmission planning document titled *Transmission Planning Criteria* defines the criteria for performing short circuit analyses.

4.4. Voltage Collapse

A major disturbance on the Newfoundland and Labrador Interconnected System may result in certain areas experiencing frequency and/or voltage excursions. To minimize the probability of voltage collapse, the transmission system shall be planned for and operated in accordance with the requirements specified in the NLSO's transmission planning document titled *Transmission Planning Criteria*.

5.0 Reliability Standards

The NLSO transmission planning document titled *Transmission Planning Criteria* defines the specific acceptable pre- and post-contingency response of the Newfoundland and Labrador Interconnected System for all elements 46 kV and above.

6.0 Treatment of NL Native Load

The treatment of NL Native Load with respect to under frequency load shedding is described in the NLSO's transmission planning document titled *Transmission Planning Criteria*.

7.0 Transmission Contingencies

Transmission contingency criteria for the Newfoundland and Labrador Interconnected System are described in the NLSO's transmission planning document titled *Transmission Planning Criteria*.

In addition to this, the NLSO's Transmission Planning group maintains a list of contingencies for study purposes. This list includes events that demonstrate the ability of the system to remain within acceptable voltage and MVA limits and to maintain system stability. Full details are described in the NLSO's transmission planning document titled *Transmission Planning Criteria*.

8.0 Voltage Limits

The applicable voltage limits for the Newfoundland and Labrador Interconnected System are described in the NLSO's transmission planning documents titled *Transmission Planning Criteria* and *Transmission Facilities Rating Guide*.

9.0 Thermal Limits

The applicable MVA limits for the Newfoundland and Labrador Interconnected System are described in the NLSO's transmission planning document titled *Transmission Facilities Rating Guide*.

10.0 Modeling Considerations

The NLSO's Transmission Planning group maintains system models in the current version of PSS®E used by NPCC¹ for performing studies necessary to complete the Planning Assessments of the Newfoundland and Labrador Interconnected System. The requirements for system models are described in the NLSO's transmission planning document titled *Annual Planning Assessment*.

¹ The NLSO transmission planning models in PSS®E use the same version as NPCC to ensure efficient data exchange with neighbouring entities.