

IESO Communication on Standards – Nuclear Plant Interface Coordination Standard (NUC-001)

Please note that NERC has posted the [Nuclear Plant Interface Coordination](#) standard for a 30-day pre-ballot review. The ballot for this standard also includes the Nuclear Plant Interface Coordination [Implementation Plan](#). This standard requires coordination between nuclear plant generator operators and transmission entities to ensure safe operation and shutdown of nuclear plants.

Webcast

The drafting team will be holding a Webcast to provide highlights of this standard on March 8 from 1–3 p.m. EST.

Ballot Pool

A new [ballot pool](#) to vote on this standard has been formed and will remain open until 8 a.m. (EST) Monday, March 19, 2007. During the pre-ballot window, members of the ballot pool may communicate with one another by using their “ballot pool list server.” The list server for this ballot pool is called: bp-nuclear_interface_in@nerc.com.

Ballot

The initial ballot for this standard will be conducted from 8 a.m. (EST) on Monday, March 19 through 8 p.m. (EST) on Friday, March 30, 2007.

Please let us know if additional information or clarification is required. A conference call or meeting could be facilitated if required.

Standard Development Roadmap

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. A SAR was received on October 20, 2004 from the Nuclear Energy Institute Grid Reliability Task Force.
2. The SAR was posted for comment from December 1, 2004 to January 7, 2005.
3. Nominations for a SAR drafting team were solicited from December 1 to December 21, 2004. The nomination period was extended to January 28, 2005 to solicit additional nominations.
4. The SAR was revised and draft 2 was posted from April 1 to April 30, 2005. The comment period was extended to May 16, 2005.
5. On May 25, 2005, the Standards Authorization Committee authorized development of a standard and appointed the SAR drafting team to serve as the standard drafting team, while soliciting additional members.
6. The first draft of the standard was posted for comment for the period December 1, 2005 through January 15, 2006.
7. The second draft of the standard was posted for comment for the period September 15, 2006 through October 16, 2006.

Description of Current Draft:

~~The drafting team has prepared a second draft of the proposed standard on nuclear power plant off-site power supply coordination for the purpose of soliciting public comment. The requested comment period is September 15, 2006 through October 16, 2006.~~

The drafting team posted its response to the comments received on the last draft of the standard and implementation plan and is posting the revised standards and implementation plan for a 30-day pre-ballot review period from February 15–March 16, 2007.

Future Development Plan:

Anticipated Actions	Anticipated Date
The drafting team plans to review stakeholder comments from the posting and make a recommendation whether to proceed to ballot or to a third draft of the standard. <u>Conduct first ballot.</u>	November 3 <u>March 19–30,</u> 2006
30-day pre-ballot posting. <u>Consider comments submitted with first ballot; post consideration of comments.</u>	November <u>April</u> 15, 2006
Ballot. <u>Conduct second ballot.</u>	December 15, 2006 <u>April</u> <u>16–26, 2007</u>
Post standards and implementation plan for 30-day review by board notice.	December 15, 2006 <u>April</u> <u>2–May 1</u>
Adoption by board. <u>Board adoption date.</u>	February 1 <u>May</u> 2, 2007

Draft 2: September 15, 20063: January 10, 2007

Proposed Effective Date: Eighteen First day of first quarter 15 months after BOT adoption, applicable regulatory approvals.

Definitions of Terms Used in Standard

This section includes all newly defined or revised terms used in the proposed standard. Terms already defined in the Reliability Standards Glossary of Terms are not repeated here. New or revised definitions listed below become approved when the proposed standard is approved. When the standard becomes effective, these defined terms will be removed from the individual standard and added to the Glossary.

Nuclear Plant Generator Operator: Any Generator Operator or Generator Owner that is a Nuclear Plant Licensee responsible for operation of a nuclear facility licensed to produce commercial power.

Nuclear Plant Off-site Power Supply (Off-site Power): The electric power supply provided from the ~~transmission~~electric system to the nuclear power plant distribution system as required per the nuclear power plant license.

Nuclear Plant Licensing Requirements (NPLRs): Requirements included in the design basis of the nuclear plant and statutorily mandated for the operation of the plant, including nuclear power plant licensing requirements for:

- 1) Off-site power supply to enable safe shutdown of the plant during an electric system or plant event; and
- 2) Avoiding preventable challenges to nuclear safety as a result of an electric system disturbance, transient, or condition.

Nuclear Plant Interface Requirements (NPIRs): The ~~agreed upon criteria to meet the requirements, based on~~ NPLRs and Bulk Electric System requirements, that have been mutually agreed to by the Nuclear Plant Generator Operator and the applicable Transmission Entities.

A. Introduction

1. **Title:** Nuclear Plant Interface Coordination
2. **Number:** NUC-001-1
3. **Purpose:** This standard requires coordination between Nuclear Plant Generator Operators and Transmission Entities for the purpose of ensuring nuclear plant safe operation and shutdown.
4. **Applicability**
 - 4.1. Nuclear Plant Generator Operator.
 - 4.2. Transmission Entities, shall mean all entities that are responsible for providing services related to Nuclear Plant Interface Requirements (NPIRs) ~~in accordance with the terms of the Agreements developed in this standard.~~ Such entities may include one or more of the following:
 - 4.2.1 Transmission Operators
 - 4.2.2 Transmission Owners
 - 4.2.3 Transmission Planners
 - 4.2.4 Transmission Service Providers
 - 4.2.5 Balancing Authorities
 - 4.2.6 Reliability Coordinators
 - 4.2.7 Planning Authorities
 - 4.2.8 Distribution Providers
 - 4.2.9 Load-serving Entities
 - 4.2.10 Generator Owners
 - 4.2.11 Generator Operators
5. **Proposed Effective Date:** ~~Eighteen~~ First day of first quarter 15 months after ~~BOT adoption~~ applicable regulatory approvals.

B. Requirements

- R1.** The Nuclear Plant Generator Operator shall provide the proposed NPIRs in writing to the applicable Transmission Entities and shall verify receipt ~~of the NPIRs.~~ [Risk Factor: Lower]
- R2.** The Nuclear Plant Generator Operator and the applicable Transmission Entities shall have in effect one or more Agreements¹ that include mutually agreed to NPIRs and document how ~~NPIRs~~ the Nuclear Plant Generator Operator and the applicable Transmission Entities shall be addressed and implemented. address and implement these NPIRs. [Risk Factor: Lower]
- R3.** Per the Agreements developed in accordance with this standard, the applicable Transmission ~~Entity~~ Entities shall incorporate the NPIRs into ~~the~~ their planning analyses of

¹ Agreements may include mutually agreed upon procedures or protocols.

the electric system and shall communicate the results of ~~the~~these analyses to the Nuclear Plant Generator Operator. [Risk Factor: Medium-]

- R4.** Per the Agreements developed in accordance with this standard, the applicable Transmission Entities shall: [Risk Factor: Medium]
- R4.1.** Incorporate the NPIRs into ~~the~~their operating ~~reliability analysis~~analyses of the electric system.
- ~~**R4.2.**—Operate the electric system to meet the NPIRs, while respecting System Operating Limits (SOL).~~
- ~~**R4.2.** Inform the Nuclear Plant Generator Operator and coordinate mitigating actions when NPIRs cannot be met.~~
- R4.3.** Inform the Nuclear Plant Generator Operator when the ~~Transmission Entity loses the~~ ability to assess the operation of the ~~transmission~~electric system affecting NPIRs is lost.
- R5.** The Nuclear Plant Generator Operator shall operate per the Agreements developed in accordance with this standard. [Risk Factor: Medium]
- R6.** Per the Agreements developed in accordance with this standard, the ~~designated~~applicable Transmission Entities and the Nuclear Plant Generator Operator shall coordinate outages and maintenance activities which affect the NPIRs. [Risk Factor: Medium]
- R7.** ~~The~~Per the Agreements developed in accordance with this standard, the Nuclear Plant Generator Operator shall inform the applicable Transmission Entities of actual or proposed changes to nuclear plant design, configuration, operations, limits, protection systems, or capabilities that may impact the ability of the ~~transmission~~electric system to meet the NPIRs. [Risk Factor: Medium]
- R8.** ~~The~~Per the Agreements developed in accordance with this standard, the applicable Transmission Entities shall inform the Nuclear Plant Generator Operator of actual or proposed changes to electric system design, configuration, operations, limits, protection systems, or capabilities that may impact the ability of the ~~transmission~~electric system to meet the NPIRs. [Risk Factor: Medium]
- R9.** The Nuclear Plant Generator Operator and the applicable Transmission Entities shall include, as a minimum, the following elements within the agreement(s) identified in R2: [Risk Factor: Lower]
- R9.1.** Administrative elements:
- R9.1.1.** Definitions of key terms used in the agreement.
- R9.1.2.** Names of the responsible entities, organizational relationships, and responsibilities related to the NPIRs.
- R9.1.3.** A requirement to review the agreement(s) at least every three years.
- R9.1.4.** A dispute resolution mechanism.
- R9.2.** Technical requirements and analysis:
- R9.2.1.** Identification of parameters, limits, configurations, and operating scenarios ~~that constitute~~included in the ~~NPIR~~NPIRs and, as applicable, procedures for providing any specific data not provided within the agreement.

- R9.2.2. Identification of facilities, components, and configuration restrictions that are essential for meeting ~~NPIR~~the NPIRs.
- R9.2.3. Types of planning and operational analyses performed specifically to support ~~NPIR~~the NPIRs, including the frequency of studies and types of Contingencies and scenarios required.
- R9.3. Operations and maintenance coordination:
 - R9.3.1. Designation of ownership of electrical facilities at the interface between the electric system and the nuclear plant and responsibilities for operational control coordination and maintenance of these facilities.
 - R9.3.2. Identification of any maintenance requirements for equipment not owned or controlled by the Nuclear Plant Generator Operator that are necessary to meet the NPIRs.
 - R9.3.3. Coordination of testing, calibration and maintenance of on-site and off-site power supply systems and related components.
 - R9.3.4. ~~Provision~~Provisions to address mitigating actions needed to avoid violating NPIRs and to address periods when ~~the electric system cannot meet NPIRs or the~~ responsible Transmission Entity loses the ability to assess the capability of the electric system to meet the NPIRs. ~~This provision~~These provisions shall include responsibility to notify the Nuclear Plant Generator Operator within a specified time frame.
 - R9.3.5. Provision to consider nuclear plant coping times ~~as~~ required by the NPLR in NPLRs and their relation to the coordination of grid and nuclear plant restoration following a nuclear plant loss of Off-site Power.
 - R9.3.6. Coordination of physical and cyber security protection of the ~~bulk electric system~~Bulk Electric System at the nuclear plant interface to ensure each asset is covered under at least one entity's plan.
 - R9.3.7. Coordination of the NPIRs with transmission system Special Protection Systems and under-frequency and under-voltage load shedding programs.
- R9.4. Communications and training:
 - R9.4.1. Provisions for communications between the Nuclear Plant Generator Operator and Transmission Entities, including communications protocols, notification time requirements, and definitions of terms.
 - R9.4.2. Provisions for coordination during an off-normal or emergency event affecting the NPIRs, including the need to provide timely information explaining the event, an estimate of when the system will be returned to a normal state, and the actual time the system is returned to normal.
 - R9.4.3. Provisions for coordinating investigations of causes of unplanned events affecting the NPIRs and developing solutions to minimize future risk of such events.
 - R9.4.4. Provisions for supplying information necessary to report to government agencies, as related to NPIRs.
 - R9.4.5. Provisions for personnel training, as related to NPIRs.

C. Measures

- M1. The Nuclear Plant Generator Operator shall, upon request of the Compliance Monitor, provide a copy of the transmittal and receipt of transmittal of the proposed NPIRs to the responsible Transmission Entities. (Requirement 1)
- M2. The Nuclear Plant Generator Operator and each Transmission Entity shall each have a copy of the Agreement(s) addressing the elements in Requirement 9 available for inspection upon request of the Compliance Monitor. (Requirement 2 and 9)
- M3. Each Transmission Entity responsible for planning analyses in accordance with the Agreement shall, upon request of the Compliance Monitor, provide a copy of the planning analyses results transmitted to the Nuclear Plant Generator Operator, showing incorporation of the NPIRs. The Compliance Monitor shall refer to the Agreements developed in accordance with this standard for specific requirements. (Requirement 3)
- M4. Each Transmission Entity responsible for operating the electric system in accordance with the Agreement shall demonstrate or provide evidence of the following, upon request of the Compliance Monitor:
 - M4.1 The NPIRs have been incorporated into the current operating ~~reliability~~ analysis of the electric system. (Requirement 4.1)
 - ~~M4.2 The electric system is being was operated to meet the NPIR, to the extent practicable under electric system conditions. (Requirement 4.2)~~
 - ~~M4.2 When NPIRs could not be met, the Transmission Entity informed the Nuclear Plant Generator Operator and coordinated the mitigating actions. (Requirement 4.3)~~
 - M4.3 The Transmission Entity informed the Nuclear Plant Generator Operator when it became aware it lost the capability to assess the operation of the electric system affecting the NPIRs. (Requirement 4.4)3)
- M5. The Nuclear Plant Generator Operator shall, upon request of the Compliance Monitor, demonstrate or provide evidence that the Nuclear Power Plant is being operated consistent with the Agreements developed in accordance with this standard. (Requirement 5)
- M6. The Transmission Entities and Nuclear Plant Generator Operator shall, upon request of the Compliance Monitor, provide evidence of the coordination between the Transmission Entities and the Nuclear Plant Generator Operator regarding outages and maintenance activities which affect the NPIRs. (Requirement 6)
- M7. The Nuclear Plant Generator Operator shall provide evidence that it informed the applicable Transmission Entities of changes to nuclear plant design, configuration, operations, limits, protection systems, or capabilities that would impact the ability of the Transmission Entities to meet the NPIRs. (Requirement 7)
- M8. The Transmission Entities shall each provide evidence that it informed the Nuclear Plant Generator Operator of changes to electric system design, configuration, operations, limits, protection systems, or capabilities that would impact the ability of the Nuclear Plant Generator Operator to meet the NPIRs. (Requirement 8)

D. Compliance

- 1. Compliance Monitoring Process
 - 1.1. Compliance Monitoring Responsibility
 - Regional Reliability Organization.

1.2. **Compliance Monitoring Period and Reset Time Frame**

One calendar year.

1.3. **Data Retention**

For Measure 1, the Nuclear Plant Generator Operator shall keep its latest transmittals and receipts.

For Measure 2, the Nuclear Plant Generator Operator and each Transmission Entity shall have its current, in-force agreement.

For Measure 3, the Transmission Entity shall have the latest planning analysis results.

For Measures 4.3, 4.4, 6 and ~~7~~⁸, the Transmission Entity shall keep evidence for two years plus current.

For Measures 5, 6 and ~~8~~⁷, the Nuclear Plant Generator Operator shall keep evidence for two years plus current.

If an entity is found non-compliant the entity shall keep information related to the noncompliance until found compliant or for two years plus the current year, whichever is longer.

Evidence used as part of a triggered investigation shall be retained by the entity being investigated for one year from the date that the investigation is closed, as determined by the Compliance Monitor.

The Compliance Monitor shall keep the last periodic audit report and all requested and submitted subsequent compliance records.

1.4. **Additional Compliance Information**

The Nuclear Plant Generator Operator and Transmission Entities shall each demonstrate compliance through self-certification or audit (periodic, as part of targeted monitoring or initiated by complaint or event), as determined by the Compliance Monitor.

2.1. Levels of Non-Compliance Violation Severity Levels

2.1.1.1. Level 1 Lower: Agreement(s) exist per this standard and NPIRs ~~are were~~ identified and implemented, but documentation ~~is missing~~^{described in M1-M8 was not provided}.

2.1.1.2. Level 2 Moderate: Agreement(s) exist per R2 and NPIRs ~~are were~~ identified and implemented, but one or more elements of the Agreement in R9 ~~are were~~ not met.

2.1.1.3. Level 3 High: One or more requirements of R3 ~~to through~~ R8 were not met.

2.1.1.4. Level 4 Severe: No proposed NPIRs were submitted per R1, no Agreement exists per this standard, or the Agreements ~~are were~~ not implemented.

E. Regional Differences

The design basis for Canadian (CANDU) NPPs does not result in the same licensing requirements as U.S. NPPs. NRC design criteria specifies that in addition to emergency on-site electrical power, electrical power from the ~~transmission~~^{electric} network also be provided to permit safe shutdown. This requirement is specified in such NRC Regulations as *10 CFR 50 Appendix A - General Design Criterion 17* and *10 CFR 50.63 Loss of all alternating current power*. There are no equivalent Canadian Regulatory requirements for *Station Blackout (SBO)* or *coping times* as they do not form part of the licensing basis for CANDU NPPs.

Therefore the definition of NPLR for Canadian CANDU units will be as follows:

Nuclear Plant Licensing Requirements (NPLR), are requirements included in the design basis of the nuclear plant and are statutorily mandated for the operation of the plant; when used in this standard, NPLR shall mean nuclear power plant licensing requirements for avoiding preventable challenges to nuclear safety as a result of an electric system disturbance, transient, or condition.

Version History

Version	Date	Action	Change Tracking