

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 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 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). 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:** First day of first quarter 15 months after 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 [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 the Nuclear Plant Generator Operator and the applicable Transmission Entities shall address and implement these NPIRs. [Risk Factor: Lower]

1. Agreements may include mutually agreed upon procedures or protocols.

- R3.** Per the Agreements developed in accordance with this standard, the applicable Transmission Entities shall incorporate the NPIRs into their planning analyses of the electric system and shall communicate the results of 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 their operating analyses of the electric system.
 - R4.2.** Operate the electric system to meet the NPIRs.
 - R4.3.** Inform the Nuclear Plant Generator Operator when the ability to assess the operation of the 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 applicable Transmission Entities and the Nuclear Plant Generator Operator shall coordinate outages and maintenance activities which affect the NPIRs. [Risk Factor: Medium]
- R7.** 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 electric system to meet the NPIRs. [Risk Factor: Medium]
- R8.** 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 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 included in the 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 the NPIRs.
- R9.2.3.** Types of planning and operational analyses performed specifically to support 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.** Provisions to address mitigating actions needed to avoid violating NPIRs and to address periods when responsible Transmission Entity loses the ability to assess the capability of the electric system to meet the NPIRs. 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 required by the 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 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 analysis of the electric system. (Requirement 4.1)

M4.2 The electric system was operated to meet the NPIRs. (Requirement 4.2)

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 4.3)

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, 6 and 8, the Transmission Entity shall keep evidence for two years plus current.

For Measures 5, 6 and 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. Violation Severity Levels

R #	Lower VSL	Moderate VSL	High VSL	Severe VSL
R1.	The Nuclear Plant Generator Operator did not verify receipt of the proposed NPIRs.	The Nuclear Plant Generator Operator submitted an incomplete proposed NPIR to the applicable transmission entities.	The Nuclear Plant Generator Operator did not provide the proposed NPIR's to some applicable entities.	The Nuclear Plant Generator Operator did not provide the proposed NPIR's to any applicable entities.
R2.				The Nuclear Plant Generator Operator or the applicable Transmission Entity does not have in effect one or more agreements that include NPIRs and documents the implementation of the NPIRs.
R3.	The applicable Transmission Entity incorporated the NPIRs into its planning analyses and identified no areas of concern but it did not communicate these results to the Nuclear Plant Generator Operator.	The applicable Transmission Entity incorporated the NPIRs into its planning analyses and identified one or more areas of concern but did not communicate these results to the Nuclear Plant Generator Operator.	The applicable Transmission Entity did not incorporate the NPIRs into its planning analyses of the electric system.	
R4.	The applicable Transmission entity failed to incorporate some minor NPIR elements into the operating analyses OR The applicable Transmission entity failed to operate the system to meet minor NPIR	The applicable Transmission entity failed to incorporate significant NPIR elements into the operating analyses OR The applicable Transmission entity failed to operate the system to meet significant	The applicable Transmission Entities did not incorporate the NPIRs into operating analyses OR The applicable Transmission entity did not operate the system to meet any NPIRs, OR	

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R #	Lower VSL	Moderate VSL	High VSL	Severe VSL
	elements.	NPIR elements.	The applicable Transmission entity did not inform the Nuclear Plant Generator Operator when the ability to assess the operation of the electric system affecting NPIRs was lost.	
R5.	The Nuclear Plant Generator Operator failed to operate the plant with respect to some minor elements contained in the agreements.	The Nuclear Plant Generator Operator failed to operate the plant with respect to significant elements contained in the agreements.	The Nuclear Plant Generator Operator did not operate the plant with respect to a material number of elements in the agreements.	
R6.	The responsible entity has coordinated/communicated with others with some exception and is mostly compliant with the directives of the requirement	The responsible entity has coordinated/communicated with others but was substantially deficient in meeting the directives of the requirement	The responsible entity has failed to coordinate/communicate with others as directed by the requirement	
R7.	The Nuclear Plant Generator Operator did not inform the applicable Transmission Entities of <u>proposed</u> changes to nuclear plant design, configuration, operations, limits, protection systems, or capabilities that may impact the ability of the electric system to meet the NPIRs.	The Nuclear Plant Generator Operator did not inform the applicable Transmission Entities of <u>actual</u> changes to nuclear plant design, configuration, operations, limits, protection systems, or capabilities that <u>may</u> impact the ability of the electric system to meet the NPIRs.	The Nuclear Plant Generator Operator did not inform the applicable Transmission Entities of <u>actual</u> changes to nuclear plant design, configuration, operations, limits, protection systems, or capabilities that <u>directly impact</u> the ability of the electric system to meet the NPIRs.	

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R #	Lower VSL	Moderate VSL	High VSL	Severe VSL
R8.	The applicable Transmission Entities did not inform the Nuclear Plant Generator Operator of <u>proposed</u> changes to transmission system design, configuration, operations, limits, protection systems, or capabilities that may impact the ability of the electric system to meet the NPIRs.	The applicable Transmission Entities did not inform the Nuclear Plant Generator Operator of <u>actual</u> changes to transmission system design, configuration, operations, limits, protection systems, or capabilities that <u>may</u> impact the ability of the electric system to meet the NPIRs.	The applicable Transmission Entities did not inform the Nuclear Plant Generator Operator of <u>actual</u> changes to transmission system design, configuration, operations, limits, protection systems, or capabilities that <u>directly impact</u> the ability of the electric system to meet the NPIRs.	
R9.	The agreement identified in R2. between the Nuclear Plant Generator Operator and the applicable Transmission Entities is missing one or more sub-components of R9.1.	The agreement identified in R2. between the Nuclear Plant Generator Operator and the applicable Transmission Entities is missing from one to five of the combined sub-components in R9.2, R9.3 and R9.4.	The agreement identified in R2. between the Nuclear Plant Generator Operator and the applicable Transmission Entities is missing from six to ten of the combined sub-components in R9.2, R9.3 and R9.4.	The agreement identified in R2. between the Nuclear Plant Generator Operator and the applicable Transmission Entities is missing eleven or more of the combined sub-components in R9.2, R9.3 and R9.4.

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 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