

Conference Call Agenda Project 2012-13 Nuclear Plant Interface Coordination Five-Year Review Team

July 8, 2013 | 11:00 a.m. to 2:00 p.m. ET

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Administrative

1. **Introductions**
2. **Review NERC Antitrust Compliance Guidelines and Public Announcement**
3. **FYRT Participant Conduct Policy**
4. **FYRT E-mail List Policy**
5. **Review Meeting Agenda and Objectives**

Agenda Items

1. **Review Previous Action Items***
 - a. A sub-team was tasked with developing a white paper to review the PRC standards and to provide a technical justification for potentially eliminating the use of the defined term "Protection Systems" in the NUC standard.
2. **Review and Finalize Discussion Document***
 - a. Discuss NUC-001-2 Sec. E. Regional Differences (Les Carter)
3. **Review Five-Year Review Recommendation (Template)***
4. **Next Steps**
 - a. Standard redlines
 - b. Standard Authorization Request (SAR)
5. **Discuss Future Meeting Dates**
 - a. July 16, 2013, 10:00 a.m to 12:00 p.m. ET
 - i. Finalize Five-Year Review Recommendation (Template).

- ii. Finalize standard redlines
- b. July 23, 2013, 10:00 a.m to 12:00 p.m. ET
 - i. Finalize SAR

6. Adjourn

*Background materials included.

Standards Development Process Participant Conduct Policy

I. General

To ensure that the standards development process is conducted in a responsible, timely and efficient manner, it is essential to maintain a professional and constructive work environment for all participants. Participants include, but are not limited to, members of the standard drafting team and observers.

Consistent with the NERC Rules of Procedure and the NERC Standard Processes Manual, participation in NERC's Reliability Standards development balloting and approval processes is open to all entities materially affected by NERC's Reliability Standards. In order to ensure the standards development process remains open and to facilitate the development of reliability standards in a timely manner, NERC has adopted the following Participant Conduct Policy for all participants in the standards development process.

II. Participant Conduct Policy

All participants in the standards development process must conduct themselves in a professional manner at all times. This policy includes in-person conduct and any communication, electronic or otherwise, made as a participant in the standards development process. Examples of unprofessional conduct include, but are not limited to, verbal altercations, use of abusive language, personal attacks or derogatory statements made against or directed at another participant, and frequent or patterned interruptions that disrupt the efficient conduct of a meeting or teleconference.

III. Reasonable Restrictions in Participation

If a participant does not comply with the Participant Conduct Policy, certain reasonable restrictions on participation in the standards development process may be imposed as described below.

If a NERC Standards Developer determines, by his or her own observation or by complaint of another participant, that a participant's behavior is disruptive to the orderly conduct of a meeting in progress, the NERC Standards Developer may remove the participant from a meeting. Removal by the NERC Standards Developer is limited solely to the meeting in progress and does not extend to any future meeting. Before a participant may be asked to leave the meeting, the NERC Standards Developer must first remind the participant of the obligation to conduct himself or herself in a professional manner and provide an opportunity for the participant to comply. If a participant is requested to leave a meeting by a NERC Standards Developer, the participant must cooperate fully with the request.

Similarly, if a NERC Standards Developer determines, by his or her own observation or by complaint of another participant, that a participant's behavior is disruptive to the orderly conduct of a

teleconference in progress, the NERC Standards Developer may request the participant to leave the teleconference. Removal by the NERC Standards Developer is limited solely to the teleconference in progress and does not extend to any future teleconference. Before a participant may be asked to leave the teleconference, the NERC Standards Developer must first remind the participant of the obligation to conduct himself or herself in a professional manner and provide an opportunity for the participant to comply. If a participant is requested to leave a teleconference by a NERC Standards Developer, the participant must cooperate fully with the request. Alternatively, the NERC Standards Developer may choose to terminate the teleconference.

At any time, the NERC Director of Standards, or a designee, may impose a restriction on a participant from one or more future meetings or teleconferences, a restriction on the use of any NERC-administered list server or other communication list, or such other restriction as may be reasonably necessary to maintain the orderly conduct of the standards development process. Restrictions imposed by the Director of Standards, or a designee, must be approved by the NERC General Counsel, or a designee, prior to implementation to ensure that the restriction is not unreasonable. Once approved, the restriction is binding on the participant. A restricted participant may request removal of the restriction by submitting a request in writing to the Director of Standards. The restriction will be removed at the reasonable discretion of the Director of Standards or a designee.

Any participant who has concerns about NERC's Participant Conduct Policy may contact NERC's General Counsel.

NERC Email List Policy

NERC provides email lists, or “listservs,” to NERC committees, groups, and teams to facilitate sharing information about NERC activities; including balloting, committee, working group, and drafting team work, with interested parties. All emails sent to NERC listserv addresses must be limited to topics that are directly relevant to the listserv group’s assigned scope of work. NERC reserves the right to apply administrative restrictions to any listserv or its participants, without advance notice, to ensure that the resource is used in accordance with this and other NERC policies.

Prohibited activities include using NERC-provided listservs for any price-fixing, division of markets, and/or other anti-competitive behavior.¹ Recipients and participants on NERC listservs may not utilize NERC listservs for their own private purposes. This may include announcements of a personal nature, sharing of files or attachments not directly relevant to the listserv group’s scope of responsibilities, and/or communication of personal views or opinions, unless those views are provided to advance the work of the listserv’s group. Use of NERC’s listservs is further subject to NERC’s Participant Conduct Policy for the Standards Development Process.

- *Updated April 2013*

¹ Please see NERC’s Antitrust Compliance Guidelines for more information about prohibited antitrust and anti-competitive behavior or practices. This policy is available at <http://www.nerc.com/commondocs.php?cd=2>

DRAFT 7/03/2013

NUC-001-2: Requirements R7 and R8 – Protection Systems

Position: The NUC-001-2 Five Year Review Team recommends deletion of "Protection Systems" in requirements R7 and R8 since it is a subset of the "nuclear plant design" and "electric system design" elements currently contained in R7 and R8 respectively. The use within R7 and R8 of the capitalized term "Protection Systems" as defined in the NERC Glossary of Terms extends the scope of changes that must be communicated between the Nuclear Plant Generator Operator and the Transmission Entities beyond the scope intended by the original NUC-001 SDT. The focus of the original SDT was on communication of the protective setpoint changes that could impact nuclear plant safe operation and shutdown. The communication and coordination of protection system changes beyond those that are unique to nuclear plants is addressed in NERC Standard PRC-001.

Background:

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: High*] (Capitalization of "Protection Systems" approved by the SC but not yet filed at FERC.)

Definition of Protection System (FERC approved 2/3/2012):

Protection System –

- Protective relays which respond to electrical quantities,
- Communications systems necessary for correct operation of protective functions
- Voltage and current sensing devices providing inputs to protective relays,
- Station dc supply associated with protective functions (including batteries, battery chargers, and non-battery-based dc supply), and
- Control circuitry associated with protective functions through the trip coil(s) of the circuit breakers or other interrupting devices.

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: High*] (Capitalization of "Protection Systems" approved by the SC but not yet filed at FERC.)

Discussion:

Requirement R7:

Protection systems are a subset of the nuclear plant design and represent only one of numerous nuclear plant systems that could be changed that may impact the ability of the electric system to

meet the NPIRs. Discussions with members of the original NUC-001 SDT identified that inclusion of protection system changes was meant to be an example of the type of change to the nuclear plant design that could potentially impact the ability of the electric system to meet the NPIRs and was used in reference to those protection systems unique to nuclear plants such as those associated with reactor coolant pumps, reactor protection systems, and emergency bus degraded grid relays. These nuclear plant protection systems can impose unique frequency and voltage requirements that can impact the NPIRs, however they are all just a subset of the overall nuclear plant design that can impact the NPIRs.

With regard to the capitalization of "Protection Systems", the use of protection systems by the original SDT was not intended to refer to a specifically defined term that is overly broad in application here, and that has other NERC compliance implications. The SDT use of protection systems was focused on the attributes that could impact the NPIRs such as frequency or voltage set points (i.e. relay settings) and not the expanded five elements of "Protection Systems" as defined in the NERC Glossary of Terms. For example, with reference to the fore mentioned nuclear plant unique protection systems, changes to the station dc supply, control circuitry, or sensing devices would not impact the NPIRs or the ability of the electric system to meet the NPIRs and as such do not need to be communicated to the transmission entities.

Protection system changes other than those unique to the nuclear plant design discussed above are coordinated between the Nuclear Plant Generator Operators and the applicable Transmission Entities in accordance with the requirements of NERC Standard PRC-001. Specifically PRC-001 requires coordination as follows:

R2. A Generator Operator or Transmission Operator shall coordinate new protective systems and changes as follows.

R2.1. Each Generator Operator shall coordinate all new protective systems and all protective system changes with its Transmission Operator and Host Balancing Authority. *[Violation Risk Factor: High][Time Horizon: Operations Planning, Same-day Operations, Real-time Operations]*

R3. Each Transmission Operator shall coordinate Protection Systems on major transmission lines and interconnections with neighboring Generator Operators, Transmission Operators, and Balancing Authorities. *[Violation Risk Factor: High][Time Horizon: Operations Planning, Same-day Operations, Real-time Operations]*

The NUC-001-2 Five Year Review Team recommends based on the above that "Protection Systems" be removed from R7 since changes to protection systems are already addressed in "changes to nuclear plant design" and for those protection systems in the scope of the NERC PRC standards, coordination between the Nuclear Plant Generator Operator and the Transmission Operator is addressed in PRC-001. The NUC-001-2 Five Year Review Team recommends that the parenthetic clause (e.g. protective setpoints) be added to R7 following "nuclear plant design" to keep an awareness of the importance of this design subset.

Requirement R8:

Protection systems are a subset of the electric system design and represent only one of numerous aspects of the electric system that could be changed that may impact the ability of the electric system to meet the NPIRs. Discussions with members of the original NUC-001 SDT identified that inclusion of protection system changes was meant to be an example of the type of change to the electric system design that could potentially impact the ability of the electric system to meet the NPIRs.

Similar to R7, with regard to the capitalization of "Protection Systems", the use of protection systems by the original SDT was not intended to refer to a specifically defined term that is overly broad in application here, and that has other NERC compliance implications. The SDT use of protection systems was focused on the attributes that could impact the NPIRs such as frequency or voltage set points (i.e. relay settings) and not the expanded five elements of "Protection Systems" as defined in the NERC Glossary of Terms.

Transmission Entity protection system changes within the scope of NERC Standard PRC-001 are coordinated between the Nuclear Plant Generator Operators and the applicable Transmission Entities in accordance with the requirements PRC-001.

Similar to R7, the NUC-001-2 Five Year Review Team recommends based on the above that "Protection Systems" be removed from R8 since changes to protection systems are already addressed in "changes to electric system design" and for those protection systems in the scope of the NERC PRC standards, coordination between the Transmission Operator and the Nuclear Plant Generator Operator is addressed in PRC-001. The NUC-001-2 Five Year Review Team recommends that the parenthetical clause (e.g. protective setpoints) be added to R8 following "electric system design" to keep an awareness of the importance of this design subset.

DRAFT 7/03/2013

NUC-001-2: Requirement R9.3.7 - Coordination of Special Protection Systems and underfrequency and undervoltage load shedding programs with NPIRs

Position: The NUC-001-2 Five Year Review Team recommends affirming the NUC-001-2 requirement R9.3.7 based on the importance that proper coordination of the NPIRs with Special Protection Systems (SPSs) and load shedding programs has with respect to nuclear plant safe operation and shutdown and the finding that no other NERC Standard addresses this coordination.

Background:

R9.3.7. Coordination of the NPIRs with transmission system Special Protection Systems and underfrequency and undervoltage load shedding programs.

Definition of Special Protection System

"An automatic protection system designed to detect abnormal or predetermined system conditions, and take corrective actions other than and/or in addition to the isolation of faulted components to maintain system reliability. Such action may include changes in demand, generation (MW and Mvar), or system configuration to maintain system stability, acceptable voltage, or power flows. An SPS does not include (a) underfrequency or undervoltage load shedding or (b) fault conditions that must be isolated or (c) out-of-step relaying (not designed as an integral part of an SPS). Also called Remedial Action Scheme."

Discussion:

It is important to nuclear plant safe operation and shutdown that the Nuclear Plant Generator Operator fully understands how Transmission Entity owned Special Protection Systems and underfrequency and undervoltage load shedding programs impact the NPIRs. It is essential that the design and implementation of the Special Protection Systems and load shedding programs minimize the potential risk to nuclear safety and that the Nuclear Plant Generator Operator is aware of the potential for actuation of these SPSs and load shedding programs in real time operations. Specifically, SPSs that may trip the nuclear plant and thereby challenge nuclear safety or SPSs and load shedding programs that may impact nuclear plant offsite power must be fully coordinated amongst the Nuclear Plant Generator Operator and the Transmission Entities.

A review of other NERC Standards did not identify any requirement for the Transmission Entities to coordinate transmission system Special Protection Systems and underfrequency and undervoltage load shedding programs with the NPIRs. This review included the following NERC Standards:

PRC-012-0: Special Protection System Review Procedure
PRC-015-0: Special Protection System Data and Documentation

PRC-006-1: Automatic Underfrequency Load Shedding
EOP-003-1: Load Shedding Plans

The NUC-001-2 Five Year Review Team recommends that R9.3.7 be affirmed and remain within the NUC-001 Standard. This is based on the importance to nuclear plant safe operation and shutdown and the finding that no other NERC Standard addresses the coordination of transmission system Special Protection Systems and underfrequency and undervoltage load shedding programs with the NPIRs.

Discussion Point: The ordering of the requirements may not be perceived as optimal, and there may be opportunities for consolidation to as few as four requirements.

Comments: Several members expressed caution about reordering or consolidating requirements. Reordering could cause the standard to be out of step with existing contracts. However, there appears to be agreement that reordering or consolidation may be warranted as part of a larger effort to make substantive revisions, but not purely for standard brevity.

Recommendation: Changes as specified below.

A. Introduction

1. **Title:** Nuclear Plant Interface Coordination
2. **Number:** NUC-001-2
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.

Discussion Point: Consider modifying text to “the safe operation and shutdown of nuclear plants.”

Comments: There is no opposition to this suggestion if such non-substantive changes are made as part of broader substantive revisions of the standard.

Recommendation: No change.

4. **Applicability:**
 - 4.1. Nuclear Plant Generator Operator.

Discussion Point: Consider modifying term to “Nuclear Plant Generator Operators.”

Comments: There is no opposition to this suggestion if such non-substantive changes are made as part of broader substantive revisions of the standard.

Recommendation: ~~Make change~~Revise.

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 Coordinators.
- 4.2.8 Distribution Providers.
- 4.2.9 Load-serving Entities.
- 4.2.10 Generator Owners.
- 4.2.11 Generator Operators.

5. **Effective Date:** April 1, 2010

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*]

Discussion Point: R1, R2, and R9 require an Agreement about the type of information an Agreement must include. It may be argued that R1 is not a Results-Based Standard (RBS) requirement and therefore is a candidate for P81 retirement. Alternatively or in addition, there may be some opportunities for consolidation of these three requirements.

Comments: At least one member suggested that R1 should be retired under P81 principles. Another member indicated that R1 and R2 necessarily require agreements to support NPIRs, and specify how that is done. Several noted the importance of considering how a new nuclear plant or transmission entity would have to reach agreement on NPIRs. Without an NPIR requirement, how would entities monitor changes? In Canada there are some cases where the transmission entity and operator are owned by the same organization, and R1 therefore still needs to require NPIRs to maintain that link. R1 may be the only place in the document that drives that. Early consensus appears to favor affirming R1.

NERC Staff: “Risk Factor: Lower” implies that R1 is a candidate for P81 retirement, or that the Risk Factor is artificially low.

Recommendation: ~~TBD~~—Affirm.

- 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: Medium*]

See R1 discussion and comments.

Recommendation: Affirm.

- 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*]

Discussion Point: This requirement appears to satisfy the Competency RBS criterion.

Recommendation: Affirm.

- R4.** Per the Agreements developed in accordance with this standard, the applicable Transmission Entities shall: [*Risk Factor: High*]
- 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.

Discussion Point: This requirement appears to satisfy the Performance and Competency RBS criteria.

Recommendation: Affirm.

- R5.** The Nuclear Plant Generator Operator shall operate per the Agreements developed in accordance with this standard. [*Risk Factor: High*]

Discussion Point: This requirement appears to satisfy the Performance RBS criterion.

1. Agreements may include mutually agreed upon procedures or protocols in effect between entities or between departments of a vertically integrated system.

Recommendation: Affirm.

- 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*]

Discussion Point: This requirement appears to satisfy the Performance RBS criterion.

Recommendation: Affirm.

- 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: High*]
(Capitalization of “Protection Systems” approved by the SC but not yet filed at FERC.)

Definition of Protection System (FERC approved 2/3/2012):

Protection System –

- **Protective relays** which respond to electrical quantities,
- Communications systems necessary for correct operation of protective functions
- Voltage and current sensing devices providing inputs to protective relays,
- Station dc supply associated with protective functions (including batteries, battery chargers, and non-battery-based dc supply), and
- Control circuitry associated with protective functions through the trip coil(s) of the circuit breakers or other interrupting devices.

Discussion Point: This requirement appears to satisfy the Performance RBS criterion. Several expressed concern about incorporating the NERC glossary definition of “Protection System,” which includes five different elements (see definition above). The original SDT had a more focused definition than the glossary definition, specifically, “protection systems” was intended to just be an example of a type of change that may impact the NPIRs. It was not intended to refer to a specifically defined term that has other NERC compliance implications. One previous SDT member suggested rewording R7 and R8 to state: . . . changes that may affect the ability of the electric system to meet the NPIRs, such as changes to nuclear plant design, configuration, . . .”

Options discussed included maintain the status quo by capitalizing “Protection Systems,” use lower case “protection systems,” or remove the term altogether and rely on the PRC standards to ensure no reliability gap. Discussion of whether PRC-001 is the same scope as what the FYRT wants here. However, another cautioned that relying on another standard could create a reliability gap risk.

NERC Staff: Use of “Protection Systems” in NUC-001-2 has been mandated by the Standards Committee and approved by FERC through its approval of the NERC Implementation Plan. Therefore, using the small caps “protection systems” is not a realistic option unless the FYRT can show that option is equally effective and efficient as “Protection Systems.” Carving out elements of “Protection Systems” to more closely match the SDT’s intent is perhaps a more viable option. However, any deviation from “Protection Systems” requires a sound technical basis. Reliance on the PRC standards requires reviewing the existing standards and potential changes to the PRC standards, and using that analysis as a foundation for articulating a rationale supporting deviation from the defined term, “Protection Systems.”

Recommendation: See below.

ASSIGNMENT 1: Develop white paper. Possible position: Items covered by PRC-001 may not need to be addressed in NUC-001, only protection elements that are unique to the nuclear power plant. John, George, and Pete.

- 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: High*]
(Capitalization of “Protection Systems” approved by the SC but not yet filed at FERC.)

Discussion Point: This requirement appears to satisfy the Performance RBS criterion. See also R7 discussion and comments.

NERC Staff: FERC Order No. 693 notes that NUC-001-2 R8 covers nuclear power plant voltage requirement information flowing back to the nuclear plant operator, and the scope of the proposed change does not appear to impact that statement.

Recommendation: White paper will address.

- 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: Medium*]

Discussion Point: See R1 discussion and comments. Several commented on the complexity of R9, and that it is more difficult to comply with multiple sub requirements. Other members questioned whether R9.1 should have been retired under P81 Phase 1, and that perhaps the retired requirements should be reinserted into the standard. Others argued that additional requirements should be retired under P81, as the reliability concern is adequately addressed in the PER standards, e.g., PER-005 (R9.4.5 below). Others suggested creating a guidance document to capture important elements that industry may deem “administrative,” but should be included in an agreement.

NERC Staff: Existing P81 retirements have already been vetted through the stakeholder process and approved by the SC. While it may be possible to provide a technical basis sufficiently strong to persuade the SC and over 90% of industry that voted to retire these requirements to reverse that action, that possibility is remote, at best. Moreover, such an effort could distract industry focus from potentially more significant recommendations. The FYRT should carefully consider the implications of attempting to resurrect any R9.1 P81 retirements. If the FYRT believes strongly that retired requirements should be addressed, the FYRT may create a guidance document that provides best practices to include administrative elements retired under P81 principles.

- R9.1.** Administrative elements: (Retirement approved by NERC BOT pending applicable regulatory approval.)
 - R9.1.1.** Definitions of key terms used in the agreement. (Retirement approved by NERC BOT pending applicable regulatory approval.)
 - R9.1.2.** Names of the responsible entities, organizational relationships, and responsibilities related to the NPIRs. (Retirement approved by NERC BOT pending applicable regulatory approval.)
 - R9.1.3.** A requirement to review the agreement(s) at least every three years. (Retirement approved by NERC BOT pending applicable regulatory approval.)
 - R9.1.4.** A dispute resolution mechanism. (Retirement approved by NERC BOT pending applicable regulatory approval.)

Recommendation: Tabled for the limited purpose of determining whether the retired elements should be included in a guidance document (consensus appears to disfavor a guidance document).

- 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.

Recommendation: Revise to provide clarity as to the fact that all agreements do not have to discuss each of the elements in R9, but that the sum total of the agreements need to address the elements.

- 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 for considering, within the restoration process, the requirements and urgency of a nuclear plant that has lost all off-site and on-site AC 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 underfrequency and undervoltage load shedding programs.

Comments: At least one commenter suggested that R9.3.2, R9.3.5, R9.3.6, R9.3.7, R9.4.3, R9.4.4, and R9.4.5 should be retired under P81 principles, and perhaps included in a guidance document.

Recommendation: R9.3.1-R9.3.5: Affirm, with exception of errata change in R9.3.5.

ASSIGNMENT 2: Reviewed CIP standards for possible duplication of R9.3.6. NERC Staff to initiate The NUC sub team conducted a conference call with NERC CIP staff on June 28, 2013 and determined that although there may be some duplication in the NUC, CIP, and NRC standards with respect to cyber security coordination, R9.3.6 acts as a coordination backstop to ensure no gap in reliability. Therefore, R9.3.6 is affirmed.

ASSIGNMENT 3: R9.3.7: (1) Review PRC standards to determine if they cover this issue; (2) review comments from initial drafting of the standard; and (3) technical review of benefit to retaining this requirement. To be assigned by John or done under the white paper review.

R9.4. Communications and training:

- R9.4.1.** Provisions for communications affecting the NPIRs between the Nuclear Plant Generator Operator and Transmission Entities, including

communications protocols, notification time requirements, and definitions of [applicable unique](#) 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. [Affirm.](#)
- 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. [Affirm.](#)
- R9.4.4.** Provisions for supplying information necessary to report to government agencies, as related to NPIRs. [Affirm.](#)
- R9.4.5.** Provisions for personnel training, as related to NPIRs. [Affirm.](#)

Recommendation: [Revise](#) (See suggested edits above).

C. Measures

- M1.** The Nuclear Plant Generator Operator shall, upon request of the Compliance Enforcement Authority, 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 Enforcement Authority. (Requirement 2 and 9)
- M3.** Each Transmission Entity responsible for planning analyses in accordance with the Agreement shall, upon request of the Compliance Enforcement Authority, provide a copy of the planning analyses results transmitted to the Nuclear Plant Generator Operator, showing incorporation of the NPIRs. The Compliance Enforcement Authority 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 Enforcement Authority:
 - 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 Enforcement Authority, 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 Enforcement Authority, 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)

Discussion Point: Consider modifying text to “Each Transmission Entity.”

Comments: There is no opposition to this suggestion if such non-substantive changes are made as part of broader substantive revisions of the standard.

Recommendation: No change.

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) (Capitalization of “Protection Systems” approved by the SC but not yet filed at FERC.)

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) (Capitalization of “Protection Systems” approved by the SC but not yet filed at FERC.)

Discussion Point: Consider modifying text to “Each Transmission Entity.”

Comments: There is no opposition to this suggestion if such non-substantive changes are made as part of broader substantive revisions of the standard.

Recommendation: No change.

D. Compliance

1. Compliance Monitoring Process

1.1. Compliance Enforcement Authority

Regional Entity.

1.2. Compliance Monitoring Period and Reset Time Frame

Not applicable.

1.3. Compliance Monitoring and Enforcement Processes:

Compliance Audits

Self-Certifications

Spot Checking
Compliance Violation Investigations
Self-Reporting
Complaints

1.4. Data Retention

The Responsible Entity shall keep data or evidence to show compliance as identified below unless directed by its Compliance Enforcement Authority to retain specific evidence for a longer period of time as part of an investigation:

- 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 a Responsible Entity is found non-compliant it shall keep information related to the noncompliance until found compliant.

The Compliance Enforcement Authority shall keep the last audit records and all requested and submitted subsequent audit records.

1.5. Additional Compliance Information

None.

2. Violation Severity Levels

- 2.1. Lower:** Agreement(s) exist per this standard and NPIRs were identified and implemented, but documentation described in M1-M8 was not provided.
- 2.2. Moderate:** Agreement(s) exist per R2 and NPIRs were identified and implemented, but one or more elements of the Agreement in R9 were not met.
- 2.3. High:** One or more requirements of R3 through R8 were not met.
- 2.4. Severe:** No proposed NPIRs were submitted per R1, no Agreement exists per this standard, or the Agreements were not implemented.

NERC Staff: Note that the VSLs have been edited under the VSL roll-up project, which should be approved by FERC soon. If the FYRT recommends making changes to the requirement, the FYRT must review the latest VSLs and VRFs.

No action.

E. Regional Differences

The design basis for Canadian (CANDU) [Nuclear Power Plants \(NPPs\)](#) does not result in the same licensing requirements as NPPs in the United States. [Nuclear Regulatory Commission \(NRC\)](#) design criteria specify that in addition to emergency on-site electrical power, electrical power from the electric network also must be provided to permit safe shutdown. ~~This requirement is specified in such as required by 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 [Nuclear Plant Licensing Requirements \(NPLR\)](#) for Canadian CANDU units will be as follows:

Discussion Point: Consider modifying text as indicated in blue. [Note that NERC staff has inserted an additional recommended change removing the reference to specific NRC regulations to obviate the need to make future changes to the NUC standard in response to errata type changes in the NRC regulations.](#) The FYRT is gathering input from various Canadian stations to ensure consistency.

Recommendation: NERC staff to reach out to Les Carter.

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.

F. Associated Documents

Version History

Version	Date	Action	Change Tracking
1	May 2, 2007	Approved by Board of Trustees	New
2	To be determined	Modifications for Order 716 to Requirement R9.3.5 and footnote 1; modifications to bring compliance elements into conformance with the latest version of the ERO Rules of Procedure.	Revision
2	August 5, 2009	Adopted by Board of Trustees	Revised
2	January 22, 2010	Approved by FERC on January 21, 2010 Added Effective Date	Update
2	February 7, 2013	R9.1, R9.1.1, R9.1.2, R9.1.3, and R9.1.4 and associated elements approved by NERC Board of Trustees for retirement as part of the Paragraph 81 project (Project 2013-02) pending applicable regulatory approval.	

Five-Year Review Recommendation to Revise NUC-001-2

DATE, 2013

Introduction

The North American Electric Reliability Corporation (NERC) has an obligation to conduct a five-year review of each Reliability Standard developed through NERC's American National Standards Institute-accredited Reliability Standards development process.¹ Project 2012-13 – Nuclear Plant Interface Coordination was created to review NUC-001-2 as part of the current cycle of five-year reviews of standards due for review.

The NERC Standards Committee appointed seven nuclear industry subject matter experts to serve on the NUC-001-2 five-year review team (FYRT) on April 22, 2013.² The FYRT used background information on the standard and the questions set forth in the Five-Year Review Template developed by NERC and approved by the NERC Standards Committee, along with associated worksheets and reference documents, to determine whether NUC-001-2 should be: (1) affirmed as is (i.e., no changes needed); (2) revised (which may include revising or retiring one or more requirements); or (3) withdrawn.

As a result of this examination, The FYRT hereby recommends to **REVISE** NUC-001-2, and will therefore also develop and submit a Standard Authorization Request (SAR) outlining the proposed scope and technical justification for the revision, along with a redlined NUC-001-2 standard reflecting recommended changes.

Applicable Reliability Standard: NUC-001-2

Note: NUC-001-2 is the mandatory and enforceable version of NUC-001 and has been enforceable since April 1, 2010. On April 11, 2012, the NERC Standards Committee approved capitalizing "Protection System" in accordance with the Implementation Plan for Project 2007-17. That recommendation has not yet been considered by the NERC

¹ The currently effective Standard Processes Manual (SPM), which became effective on June 27, 2013, obligates NERC to conduct periodic reviews of all Reliability Standards at least once every ten years, and periodic reviews of those standards that are American National Standards (approved by the American National Standards Institute) at least once every five years. The NUC standard is not an American National Standard, and thus the NUC standard would only require a periodic review at least once every ten years under the current SPM. However, the former SPM, which became effective on January 31, 2012, required all standards to undergo a five-year review, and this five-year review process was launched under that SPM. The periodic review process is addressed on page 45 of the current SPM: http://www.nerc.com/pa/Stand/Resources/Documents/Appendix_3A_StandardsProcessesManual.pdf.

² The Standards Committee added the seventh FYRT member on May 21, 2013.

Board of Trustees. Additionally, the NERC Board of Trustees approved retiring R9.1 and its sub requirements on February 7, 2013 as part of the Paragraph 81 project (Project 2013-02) pending applicable regulatory approval. FERC issued a Notice of Proposed Rulemaking on April 18, 2013, proposing to, among other things, retire R9.1 and its sub requirements.

FYRT Members (name and organization):

1. John Gyraht (Chair), Exelon Generation LLC (Nuclear)
2. George Attarian (Vice Chair), Duke Energy
3. Mukund "Mookie" Chander, Entergy Services Inc.
4. Kevin Donnelly, Consolidated Edison of NY
5. Pete Jenkins, Luminant Generation Company LLC
6. Jerry Whooley, PJM Interconnection
7. Les Carter, Ontario Power Generation

Date Review Completed:

Background Information *(completed by NERC staff)*

1. Are there any outstanding Federal Energy Regulatory Commission directives associated with the Reliability Standard? (If so, NERC staff will attach a list of the directives with citations to associated FERC orders for inclusion in a SAR.)

Yes

No

Note that several responses to FERC Order 693 directives require retaining specific NUC-001-2 language (relevant language noted in *italics*):

- (S- Ref 10370 - Para 1608): Next-day analysis required of minimum voltages at nuclear power plant auxiliary buses. Next day analysis is required in proposed TOP-002-3, R1. A specified minimum voltage limit is by definition an SOL which must be studied in proposed TOP-002-3, Requirement R1. Additionally, *approved NUC-001-2, Requirements R3 & R4.1 require the transmission entity to incorporate NPIRs in their planning and operating analyses.* Approved FAC-011-2 and approved FAC-014-2, Requirement R2 require the Transmission Operator to incorporate SOLs into their analyses. All data required for Operational Planning Analyses is stipulated in proposed TOP-003-2. *Approved NUC-001-2, Requirements R3 & R8 covers the information flowing back to the nuclear plant operator.*
 - (S- Ref 10374): Directive applicable to TOP-002 is covered in NUC-001-1, which requires one to “[i]nform the nuclear plant operator in real-time if the auxiliary power bus voltages cannot be maintained.”
 - (S- Ref 10391 - Para 1671): NRC has raised some significant issues regarding the consideration of nuclear power plants voltage requirements. Consider the NRCs comments on voltage requirements as part of the standards development process. Next day analysis is required in proposed TOP-002-3, R1. A specified minimum voltage limit is by definition an SOL which must be studied in proposed TOP-002-3, Requirement R1. Additionally, *approved NUC-001-2, Requirements R3 & R4.1 require the transmission entity to incorporate NPIRs in their planning and operating analyses.* Approved FAC-011-2 and approved FAC-014-2, Requirement R2 require the Transmission Operator to incorporate SOLs into their analyses. All data required for Operational Planning Analyses is stipulated in proposed TOP-003-2. *Approved NUC-001-2, Requirements R3 & R8 covers the information flowing back to the nuclear plant operator.*
2. Have stakeholders requested clarity on the Reliability Standard in the form of an Interpretation (outstanding, in progress, or approved), Compliance Application Notice (CAN) (outstanding, in progress, or approved), or an outstanding submission to NERC’s Issues Database? (If there are, NERC staff will include a list of the Interpretation(s), CAN(s), or stakeholder-identified issue(s) contained in the NERC Issues Database that apply to the Reliability Standard.)

Yes No

3. Is the Reliability Standard one of the most violated Reliability Standards? If so, does the root cause of the frequent violation appear to be a lack of clarity in the language?

 Yes No

Please explain: Based on NERC staff's review of violations and possible violations over the past three years, the NUC Reliability Standard is one of the least-violated Reliability Standards.

4. Does the Reliability Standard need to be converted to the results-based standard format as outlined in *Attachment 1: Results-Based Standards*? (Note that the intent of this question is to ensure that, as Reliability Standards are reviewed, the formatting is changed to be consistent with the current format of a Reliability Standard. If the answer is yes, the formatting should be updated when the Reliability Standard is revised.)

 Yes No

Questions Considered by the FYRT

If NERC staff answered “Yes” to any of the questions above, the Reliability Standard probably requires revision. The questions below are intended to further guide your review. Some of the questions reference documents provided by NERC staff as indicated in the Background questions above.

1. **Paragraph 81:** Does one or more of the requirements in the Reliability Standard meet criteria for retirement or modification based on Paragraph 81 concepts? Use *Attachment 2: Paragraph 81 Criteria* to make this determination.

Yes

No

Please summarize your application of Paragraph 81 Criteria, if any: R9.1 has been retired under Paragraph 81 principles, pending applicable regulatory approval. The review team applied the criteria specified in *Attachment 2: Paragraph 81 Criteria* in reviewing the remainder of the NUC standard and determined that no additional requirements should be retired under Paragraph 81 principles.

2. **Clarity:** If the Reliability Standard has an Interpretation, CAN, or issue associated with it, or is frequently violated because of ambiguity, it probably needs to be revised for clarity. Beyond these indicators, is there any reason to believe that the Reliability Standard should be modified to address a lack of clarity? Consider:
 - a. Is this a Version 0 Reliability Standard?
 - b. Does the Reliability Standard have obviously ambiguous language or language that requires performance that is not measurable?
 - c. Are the requirements consistent with the purpose of the Reliability Standard?

Yes

No

Please summarize your assessment:

3. **Definitions:** Do any of the defined terms used within the Reliability Standard need to be refined?

Yes

No

Please explain:

4. **Compliance Elements:** Are the compliance elements associated with the requirements (Measures, Data Retention, VRFs, and VSLs) consistent with the direction of the Reliability Assurance Initiative and FERC and NERC guidelines? If you answered “No,” please identify which elements require revision, and why: M2 does not address every element of R1. M4-M8 do not give examples of what constitutes “evidence.” R7/R8 “may,” M7/M8 “would.” M8 does not contain “actual or proposed” language as used in R8.

Yes

No

5. **Consistency with Other Reliability Standards:** Does the Reliability Standard need to be revised for formatting and language consistency among requirements within the Reliability Standard or consistency with other Reliability Standards? If you answered “Yes,” please describe the changes needed to achieve formatting and language consistency: Any revised NUC standard must be written on the new NERC standard template.

Yes

No

6. **Changes in Technology, System Conditions, or other Factors:** Does the Reliability Standard need to be revised to account for changes in technology, system conditions, or other factors? If you answered “Yes,” please describe the changes and specifically what the potential impact is to reliability if the Reliability Standard is not revised:

Yes

No

7. **Consideration of Generator Interconnection Facilities:** Is responsibility for generator interconnection Facilities appropriately accounted for in the Reliability Standard?

Yes

No

Guiding Questions:

If the Reliability Standard is applicable to GOs/GOPs, is there any ambiguity about the inclusion of generator interconnection Facilities? (If generation interconnection Facilities could be perceived to be excluded, specific language referencing the Facilities should be introduced in the Reliability Standard.)

If the Reliability Standard is not applicable to GOs/GOPs, is there a reliability-related need for treating generator interconnection Facilities as transmission lines for the purposes of this Reliability Standard? (If so, GOs and GOPs that own or operate relevant generator interconnection Facilities should be explicit in the applicability section of the Reliability Standard.)

Recommendation

The answers to the questions above, along with a preliminary recommendation of the SMEs conducting the review of the Reliability Standard, will be posted for a 45-day informal comment period, and the comments publicly posted. The SMEs will review the comments to evaluate whether to modify their initial recommendation, and will document the final recommendation which will be presented to the Standards Committee.

Preliminary Recommendation (to be completed by the SME team after its review and prior to posting the results of the review for industry comment):

- AFFIRM
 REVISE
 RETIRE

Technical Justification (*If the SME team recommends that the Reliability Standard be revised, a draft SAR may be included and the technical justification included in the SAR*): See attached draft SAR.

Preliminary Recommendation posted for industry comment (date): [REDACTED]

Final Recommendation (to be completed by the SME team after it has reviewed industry comments on the preliminary recommendation):

- AFFIRM (*This should only be checked if there are no outstanding directives, interpretations or issues identified by stakeholders.*)
 REVISE
 RETIRE

Technical Justification (*If the SME team recommends that the Reliability Standard be revised, a draft SAR may be included and the technical justification included in the SAR*): [REDACTED]

Date submitted to NERC Staff: [REDACTED]

Attachment 1: Results-Based Standards

The fourth question for NERC staff asks if the Reliability Standard needs to be converted to the results-based standards (RBS) format. The information below will be used by NERC staff in making this determination, and is included here as a reference for the SME team and other stakeholders.

RBS standards employ a defense-in-depth strategy for Reliability Standards development where each requirement has a role in preventing system failures and the roles are complementary and reinforcing. Reliability Standards should be viewed as a portfolio of requirements designed to achieve an overall defense-in-depth strategy and comply with the quality objectives identified in the resource document titled, "[Acceptance Criteria of a Reliability Standard](#)."

A Reliability Standard that adheres to the RBS format should strive to achieve a portfolio of performance-, risk-, and competency-based mandatory reliability requirements that support an effective defense-in-depth strategy. Each requirement should identify a clear and measurable expected outcome, such as: a) a stated level of reliability performance, b) a reduction in a specified reliability risk, or c) a necessary competency.

- a. **Performance-Based**—defines a particular reliability objective or outcome to be achieved. In its simplest form, a results-based requirement has four components: who, under what conditions (if any), shall perform what action, to achieve what particular result or outcome?
- b. **Risk-Based**—preventive requirements to reduce the risks of failure to acceptable tolerance levels. A risk-based reliability requirement should be framed as: who, under what conditions (if any), shall perform what action, to achieve what particular result or outcome that reduces a stated risk to the reliability of the bulk power system?
- c. **Competency-Based**—defines a minimum set of capabilities an entity needs to have to demonstrate it is able to perform its designated reliability functions. A competency-based reliability requirement should be framed as: who, under what conditions (if any), shall have what capability, to achieve what particular result or outcome to perform an action to achieve a result or outcome or to reduce a risk to the reliability of the bulk power system?

Additionally, each RBS-adherent Reliability Standard should enable or support one or more of the eight reliability principles listed below. Each Reliability Standard should also be consistent with all of the reliability principles.

1. Interconnected bulk power systems shall be planned and operated in a coordinated manner to perform reliably under normal and abnormal conditions as defined in the NERC Standards.

2. The frequency and voltage of interconnected bulk power systems shall be controlled within defined limits through the balancing of real and reactive power supply and demand.
3. Information necessary for the planning and operation of interconnected bulk power systems shall be made available to those entities responsible for planning and operating the systems reliably.
4. Plans for emergency operation and system restoration of interconnected bulk power systems shall be developed, coordinated, maintained, and implemented.
5. Facilities for communication, monitoring, and control shall be provided, used, and maintained for the reliability of interconnected bulk power systems.
6. Personnel responsible for planning and operating interconnected bulk power systems shall be trained, qualified, and have the responsibility and authority to implement actions.
7. The reliability of the interconnected bulk power systems shall be assessed, monitored, and maintained on a wide-area basis.
8. Bulk power systems shall be protected from malicious physical or cyber attacks.

If the Reliability Standard does not provide for a portfolio of performance-, risk-, and competency-based requirements or consistency with NERC's reliability principles, NERC staff should recommend that the Reliability Standard be reformatted in accordance with RBS format.

Attachment 2: Paragraph 81 Criteria

The first question for the SME Review Team asks if one or more of the requirements in the Reliability Standard meet(s) criteria for retirement or modification based on Paragraph 81 concepts.³ Use the Paragraph 81 criteria explained below to make this determination. Document the justification for the decisions throughout and provide them in the final assessment in the Five-Year Review worksheet.

For a Reliability Standard requirement to be proposed for retirement or modification based on Paragraph 81 concepts, it must satisfy **both**: (i) Criterion A (the overarching criterion) and (ii) at least one of the Criteria B listed below (identifying criteria). In addition, for each Reliability Standard requirement proposed for retirement or modification, the data and reference points set forth below in Criteria C should be considered for making a more informed decision.

Criterion A (Overarching Criterion)

The Reliability Standard requirement requires responsible entities (“entities”) to conduct an activity or task that does little, if anything, to benefit or protect the reliable operation of the BES.

Section 215(a) (4) of the United States Federal Power Act defines “reliable operation” as: “... operating the elements of the bulk-power system within equipment and electric system thermal, voltage, and stability limits so that instability, uncontrolled separation, or cascading failures of such system will not occur as a result of a sudden disturbance, including a cybersecurity incident, or unanticipated failure of system elements.”

Criteria B (Identifying Criteria)

B1. Administrative

The Reliability Standard requirement requires responsible entities to perform a function that is administrative in nature, does not support reliability and is needlessly burdensome.

This criterion is designed to identify requirements that can be retired or modified with little effect on reliability and whose retirement or modification will result in an increase in the efficiency of the ERO compliance program. Administrative functions may include a task that is related to developing procedures or plans, such as establishing communication contacts. Thus, for certain requirements, Criterion B1 is closely related to Criteria B2, B3 and B4. Strictly administrative functions do not inherently negatively impact reliability directly and, where possible, should be eliminated or modified for purposes of efficiency and to allow the ERO and entities to appropriately allocate resources.

³ In most cases, satisfaction of the Paragraph 81 criteria will result in the retirement of a requirement. In some cases, however, there may be a way to modify a requirement so that it no longer satisfies Paragraph 81 criteria. Recognizing that, this document refers to both options.

B2. Data Collection/Data Retention

These are requirements that obligate responsible entities to produce and retain data which document prior events or activities, and should be collected via some other method under NERC's rules and processes.

This criterion is designed to identify requirements that can be retired or modified with little effect on reliability. The collection and/or retention of data do not necessarily have a reliability benefit and yet are often required to demonstrate compliance. Where data collection and/or data retention is unnecessary for reliability purposes, such requirements should be retired or modified in order to increase the efficiency of the ERO compliance program.

B3. Documentation

The Reliability Standard requirement requires responsible entities to develop a document (*e.g.*, plan, policy or procedure) which is not necessary to protect BES reliability.

This criterion is designed to identify requirements that require the development of a document that is unrelated to reliability or has no performance or results-based function. In other words, the document is required, but no execution of a reliability activity or task is associated with or required by the document.

B4. Reporting

The Reliability Standard requirement obligates responsible entities to report to a Regional Entity, NERC or another party or entity. These are requirements that obligate responsible entities to report to a Regional Entity on activities which have no discernible impact on promoting the reliable operation of the BES and if the entity failed to meet this requirement there would be little reliability impact.

B5. Periodic Updates

The Reliability Standard requirement requires responsible entities to periodically update (*e.g.*, annually) documentation, such as a plan, procedure or policy without an operational benefit to reliability.

This criterion is designed to identify requirements that impose an updating requirement that is out of sync with the actual operations of the BES, unnecessary, or duplicative.

B6. Commercial or Business Practice

The Reliability Standard requirement is a commercial or business practice, or implicates commercial rather than reliability issues.

This criterion is designed to identify those requirements that require: (i) implementing a best or outdated business practice or (ii) implicating the exchange of or debate on commercially sensitive information while doing little, if anything, to promote the reliable operation of the BES.

B7. Redundant

The Reliability Standard requirement is redundant with: (i) another FERC-approved Reliability Standard requirement(s); (ii) the ERO compliance and monitoring program; or (iii) a governmental regulation (e.g., Open Access Transmission Tariff, North American Energy Standards Board (“NAESB”), etc.).

This criterion is designed to identify requirements that are redundant with other requirements and are, therefore, unnecessary. Unlike the other criteria listed in Criterion B, in the case of redundancy, the task or activity itself may contribute to a reliable BES, but it is not necessary to have two duplicative requirements on the same or similar task or activity. Such requirements can be retired or modified with little or no effect on reliability and removal will result in an increase in efficiency of the ERO compliance program.

Criteria C (Additional data and reference points)

Use the following data and reference points to assist in the determination of (and justification for) whether to proceed with retirement or modification of a Reliability Standard requirement that satisfies both Criteria A and B:

C1. Was the Reliability Standard requirement part of a FFT filing?

The application of this criterion involves determining whether the requirement was included in a FFT filing.

C2. Is the Reliability Standard requirement being reviewed in an ongoing Standards Development Project?

The application of this criterion involves determining whether the requirement proposed for retirement or modification is part of an active Standards Development Project, with consideration for the status of the project. If the requirement has been approved by Registered Ballot Body and is scheduled to be presented to the NERC Board of Trustees, in most cases it will not need to be addressed in the five-year review. The exception would be a requirement, such as the Critical Information Protection (“CIP”) requirements for Version 3 and 4, that is not due to be retired for an extended period of time. Also, for informational purposes, whether the requirement is included in a future or pending Standards Development Project should be identified and discussed.

C3. What is the VRF of the Reliability Standard requirement?

The application of this criterion involves identifying the VRF of the requirement proposed for retirement or modification, with particular consideration of any requirement that has been assigned as having a Medium or High VRF. Also, the fact that a requirement has a Lower VRF is not dispositive that

it qualifies for retirement or modification. In this regard, Criterion C3 is considered in light of Criterion C5 (Reliability Principles) and C6 (Defense in Depth) to ensure that no reliability gap would be created by the retirement or modification of the Lower VRF requirement. For example, no requirement, including a Lower VRF requirement, should be retired or modified if doing so would harm the effectiveness of a larger scheme of requirements that are purposely designed to protect the reliable operation of the BES.

C4. In which tier of the most recent Actively Monitored List (AML) does the Reliability Standard requirement fall?

The application of this criterion involves identifying whether the requirement proposed for retirement or modification is on the most recent AML, with particular consideration for any requirement in the first tier of the AML.

C5. Is there a possible negative impact on NERC's published and posted reliability principles?

The application of this criterion involves consideration of the eight following reliability principles published on the NERC webpage.

Reliability Principles

NERC Reliability Standards are based on certain reliability principles that define the foundation of reliability for North American bulk power systems. Each reliability standard shall enable or support one or more of the reliability principles, thereby ensuring that each standard serves a purpose in support of reliability of the North American bulk power systems. Each reliability standard shall also be consistent with all of the reliability principles, thereby ensuring that no standard undermines reliability through an unintended consequence.

Principle 1. Interconnected bulk power systems shall be planned and operated in a coordinated manner to perform reliably under normal and abnormal conditions as defined in the NERC Standards.

Principle 2. The frequency and voltage of interconnected bulk power systems shall be controlled within defined limits through the balancing of real and reactive power supply and demand.

Principle 3. Information necessary for the planning and operation of interconnected bulk power systems shall be made available to those entities responsible for planning and operating the systems reliably.

Principle 4. Plans for emergency operation and system restoration of interconnected bulk power systems shall be developed, coordinated, maintained, and implemented.

Principle 5. Facilities for communication, monitoring, and control shall be provided, used, and maintained for the reliability of interconnected bulk power systems.

Principle 6. Personnel responsible for planning and operating interconnected bulk power systems shall be trained, qualified, and have the responsibility and authority to implement actions.

Principle 7. The reliability of the interconnected bulk power systems shall be assessed, monitored, and maintained on a wide-area basis.

Principle 8. Bulk power systems shall be protected from malicious physical or cyber attacks. (footnote omitted).

C6. Is there any negative impact on the defense in depth protection of the BES?

The application of this criterion considers whether the requirement proposed for retirement or modification is part of a defense in depth protection strategy. In other words, the assessment is to verify whether other requirements rely on the requirement proposed for retirement or modification to protect the BES.

C7. Does the retirement or modification promote results or performance based Reliability Standards?

The application of this criterion considers whether the requirement, if retired or modified, will promote the initiative to implement results- and/or performance-based Reliability Standards.

Project 2012-13 Nuclear Plant Interface Coordination (NUC-001-2) Action Plan

Effort	Task	Description	Lead Organization	Deliverables	Estimated Completion
<i>Internal Standards Process Preparation</i>	Brief the Standards Committee	Informally discuss the work plan for this project with the SC	Standards	SC Talking Points document Five-Year Review Template Standards Announcement	Complete (2/28)
	Issue Standards Announcement	Invite industry SMEs to serve on the Five-Year Review Team	Standards	Standards Announcement	Complete (3/6)
	Informal outreach	Engage prospective FYRT members, including previous SDT members	Standards	Preliminary FYRT roster	Complete (3/29)
	Webinar notice	Issue notice of industry webinar	Standards	Webinar notice	Complete
	Report on FYRT nominations	Provide FYRT nomination spreadsheet to Laura Hussey's group	Wendy Muller	FYRT nominations spreadsheet	Complete (3/28)
	Informally Propose FYRT members	Review FYRT nominations with SC leadership	Standards	Draft FYRT Roster recommendation	Complete (4/9)

Effort	Task	Description	Lead Organization	Deliverables	Estimated Completion
	Propose FYRT members	Recommend FYRT members to the SC	Standards	Final FYRT Roster recommendation	Complete (4/16)
	Internal conference call to discuss five-year review	Develop plan for NERC review of directives, RBS, and P81	Standards	Five-Year Review Template	Complete (4/22)
	Finalize FYRT	Obtain SC approval of Review Team members	Standards Committee	Review Team Approval	Complete (4/22)
	Internal conference call to discuss five-year review	Finalize recommendations on directives, RBS, and P81	Standards	Preliminary Five-Year Review recommendations	Complete
<i>Five-Year Review Preparation</i>	Industry Training webinar	Train industry and FYRT on the five-year review process	Standards	Five-Year Review PowerPoint Five-Year Review Template	Complete (5/7)
	Advise FYRT members	Advise FYRT members and leadership of status, date range of initial FYRT conference call and face-to-face meeting (Doodle poll), and provide documents	Standards	E-mail to FYRT members Five-Year Review Template Project Action Plan	Complete (5/14)

Effort	Task	Description	Lead Organization	Deliverables	Estimated Completion
	Initial FYRT conference call	FYRT introductions, confirm receipt of documents, discuss Action Plan, discuss initial NERC recommendations, schedule first face-to-face meeting	Review Team	Meeting Notes Updated Five-Year Review Template	Complete (5/14)
	FYRT conference call	Review discussion document, discuss FYRT DC meeting agenda		Draft NUC-001-2 FYR Discussion Document	Complete (6/3)
<i>Formal Five-Year Review</i>	FYRT meeting	First Five-Year Review Team meeting to develop Draft Five-Year-Review Recommendation	Review Team	Draft Five-Year Review Recommendation	Complete (6/13)
	FYRT conference call	Finalize Five-Year-Review Recommendation	Review Team	Sub team white papers Final draft FYR Recommendation	July 8, 2013
	FYRT conference call	Finalize standard redlines and SAR	Review Team	Final draft Five-Year Review Recommendation	July 16, 2013
	FYRT conference call (if necessary)	Finalize standard redlines and SAR	Review Team	Final FYR Recommendation Final SAR	July 23, 2013

Effort	Task	Description	Lead Organization	Deliverables	Estimated Completion
Post Review Activities	Post recommendation for 45-day comment period *or* Submit to SC for action	Recommend whether the Reliability Standard should be reaffirmed, revised, or withdrawn (if posted on July 26, 2013, comments would be due September 9, 2013)	Standards	Five-Year Review Recommendation	July 26, 2013
	Webinar	Advise industry of FYRT recommendation if not first referred to the SC for action	Review Team Chair / Standards	NUC-001-2 Five-Year Review Final Recommendation PowerPoint	August 5-9, 2013
	Review Team conference call or Review Team Meeting	Respond to comments on original recommendation; revise as necessary if not first referred to the SC for action	Review Team	Five-Year Review Consideration of Comments and Final Recommendation document	September 9-13, 2013
	Report to Standards Committee	Complete Five-Year Review (SC meeting is on September 19, 2013)	Review Team	Provide to Standards Committee industry comments, FYRT response to comments, and recommendation on whether the Reliability Standard should be reaffirmed, revised (SAR), or withdrawn (SAR)	September 12, 2013
	Standards Committee action	Act on FYRT recommendation if not first referred to the SC for action	Standards Committee	Reaffirmation to the BOT or act on SAR	September 19, 2013
	Initial Ballot				TBD

Effort	Task	Description	Lead Organization	Deliverables	Estimated Completion
	Recirculation Ballot				TBD
	Present to the BOT				TBD

Meeting Notes

Project 2012-13 Nuclear Plant Interface Coordination Five-Year Review Team

June 13, 2013 | 8:30 a.m. to 4 p.m. Eastern

Administrative

1. Introductions

Standards Developer Sean Cavote initiated the meeting and reviewed the NERC Antitrust Compliance Guidelines, public announcement, Participant Conduct Policy, and E-mail List Policy. Participants were introduced and those in attendance were:

Name	Company	Member/ Observer	In-Person/ Conference Call
John Gyrath (Chair)	Exelon Generation	Member	In-Person
George Attarian (Vice Chair)	Duke Energy	Member	Conference Call
Kevin Donnelly	ConEd	Member	In-Person
Pete Jenkins	Luminant Generation	Member	In-Person
Jerry Whooley	PJM	Member	In-Person
Mike Gandolfo	FERC	Observer	In-Person
Thompson Adu	Northeast Utilities	Observer	Conference Call
Rebecca Berdahl	Bonneville Power Administration	Observer	Conference Call
Stephen Berger	PPL Susquehanna	Observer	Conference Call
Trey Coley	Southern Nuclear	Observer	Conference Call
Bob Coughlin	ISO New England	Observer	Conference Call
Richard Edge	Southern Nuclear	Observer	Conference Call
Mike Garton	Dominion	Observer	Conference Call
Mark Godfrey	Pepco Holdings Inc.	Observer	Conference Call

Name	Company	Member/ Observer	In-Person/ Conference Call
Dennis Hassler	PPL Electric Utilities	Observer	Conference Call
Charles Jen	CenterPoint Energy	Observer	Conference Call
Robert Kondziolka	Salt River Project	Observer	Conference Call
Marcus Lotto	Southern California Edison	Observer	Conference Call
Roni Mejia	Southern California Edison	Observer	Conference Call
Larry Nash	Dominion	Observer	Conference Call
Judianne O'Brien	ISO New England	Observer	Conference Call
Daniel Patz	Southern California Edison	Observer	Conference Call
Bob Pierce	Duke Energy	Observer	Conference Call
Frank Rahn	WRS	Observer	Conference Call
Jim Uhrin	ReliabilityFirst Corporation	Observer	Conference Call
Nick Ware	ITC Holdings	Observer	Conference Call
Kyle Watson	Entergy Service	Observer	Conference Call
Sean Cavote	NERC	Member	In-Person
Stephen Crutchfield	NERC	Member	Conference Call
Michael Gildea	NERC	Observer	In-Person
Mallory Huggins	NERC	Member	In-Person
Darrel Richardson	NERC	Observer	In-Person
Stacey Tyrewala	NERC	Member	In-Person

2. Review Meeting Agenda and Objectives

Five-year review team Chair John Gyrath reviewed the agenda. There were no proposed changes.

Agenda Items

1. Review and Discuss Discussion Document

- a. *Purpose Statement:* Affirmed.

- b. *Applicability*: The team recommends making “Nuclear Plant Generator Operator” plural for clarity, understanding that other changes are recommended elsewhere in the standard.
- c. *Requirement R1*: The team believes that while this requirement is somewhat administrative, R1 is still required for reliability and needed as part of the process that leads to R2. Affirmed.
- d. *Requirement R2*: Affirmed.
- e. *Requirement R3*: Affirmed, assuming time horizon is long term.
- f. *Requirement R4*: Affirmed.
- g. *Requirement R5*: Affirmed.
- h. *Requirement R6*: There was some discussion about whether the VRF should be changed to High, but ultimately the team determined that the Medium VRF was still appropriate. Affirmed.
- i. *Requirement R7 and Definition of Protection System*: NERC counsel Stacey Tyrewala recapped the history and process of the revision to the definition of “Protection System,” which was approved by FERC in February 2012. Stacey indicated that the team could change the former term “protections systems” to a different term or phrase, but that the team must provide a technical justification for that change. The team tentatively determined that it would refer to “protective relays” instead of “protection systems” and develop a white paper explaining how such a change would not lower the level of reliability. The team Chair, George Attarian, and Pete Jenkins volunteered to develop the white paper.
- j. *Requirement R8*: Analysis of R8 will be incorporated into the white paper referenced above.
- k. *Requirement R9*:
 - i. *R9.1*: The FYRT discussed whether the parts in Requirement R9.1, which have been approved for retirement by NERC’s Board of Trustees as part of Paragraph 81 Phase 1, need to be retained in some fashion. Some team members expressed interest in retaining the parts of Requirement R9.1 in the standard or in a guidance document, but the majority believe that the retired requirements are not necessary for reliability. The team Chair requested that the discussion item be left open for future discussion as to whether the retired elements should be retained in a guidance document.
 - ii. *R9.2*: The FYRT recommends revising R9.2 to provide clarity about the fact that not all agreements have to discuss each element in R9.2, but that in sum the agreement does need to account for each item.
 - iii. *R9.3*: The team affirmed R3.1-3.5. The FYRT determined that R9.3.6 might be redundant with CIP standards and formed a subcommittee to review the CIP suite of standards for that possible redundancy. NERC staff will initiate this CIP review and provide data to the subcommittee. Similarly, the team determined that R9.3.7 might

be redundant with some PRC standards, and the subcommittee also will review the PRC standards for redundancy.

- iv. The team recommends editing *R9.4*: R9.4.1 to clarify that it is related to communications that specifically affect NPIRs. The other parts of the requirements were affirmed.

2. Informal Outreach and Other

- a. The Chair reminded FYRT members to reach out to their contacts in the industry for feedback on the recommendations developed during the meeting.
- b. The Chair and NERC staff committed to reach out to Les Carter prior to the next conference call to discuss Canadian implications of suggested changes, particularly on regional differences.

3. Future Meetings

- a. July 8, 2013, 11 a.m.-2 p.m. ET

4. Adjourn

- a. The meeting was adjourned at 1:25 p.m. ET

Team Roster

Project 2012-13 NUC-001-2 Five-Year Review Team

	Participant	Entity
Chair	John Gyraht	Exelon Generation LLC (Nucler)
Vice Chair	George Attarian	Duke Energy
Member	Mukund "Mookie" Chander	Entergy Services Inc.
Member	Kevin Donnelly	Consolidated Edison of NY
Member	Pete Jenkins	Luminant Generation Company LLC
Member	Jerry Whooley	PJM Interconnection
Member	Les Carter	Ontario Power Generation
NERC Staff	Sean Cavote (Lead Standards Developer)	NERC
NERC Staff	Mallory Huggins (Supporting Standards Developer)	NERC
NERC Staff	Stephen Crutchfield (Supporting Standards Developer)	NERC
NERC Staff	Laura Hussey (Director of Standards Development)	NERC

Version	Date	Description

A. Introduction

1. **Title:** Nuclear Plant Interface Coordination
2. **Number:** NUC-001-2
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 Coordinators.
 - 4.2.8 Distribution Providers.
 - 4.2.9 Load-serving Entities.
 - 4.2.10 Generator Owners.
 - 4.2.11 Generator Operators.
5. **Effective Date:** April 1, 2010

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: Medium*]
- 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: High*]

1. Agreements may include mutually agreed upon procedures or protocols in effect between entities or between departments of a vertically integrated system.

- 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: High*]
- 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: High*]
- 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: High*]
- 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: Medium*]
 - R9.1.** Administrative elements: (Retirement approved by NERC BOT pending applicable regulatory approval.)
 - R9.1.1.** Definitions of key terms used in the agreement. (Retirement approved by NERC BOT pending applicable regulatory approval.)
 - R9.1.2.** Names of the responsible entities, organizational relationships, and responsibilities related to the NPIRs. (Retirement approved by NERC BOT pending applicable regulatory approval.)
 - R9.1.3.** A requirement to review the agreement(s) at least every three years. (Retirement approved by NERC BOT pending applicable regulatory approval.)
 - R9.1.4.** A dispute resolution mechanism. (Retirement approved by NERC BOT pending applicable regulatory approval.)
 - 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 for considering, within the restoration process, the requirements and urgency of a nuclear plant that has lost all off-site and on-site AC 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 underfrequency and undervoltage 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 Enforcement Authority, 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 Enforcement Authority. (Requirement 2 and 9)

- M3.** Each Transmission Entity responsible for planning analyses in accordance with the Agreement shall, upon request of the Compliance Enforcement Authority, provide a copy of the planning analyses results transmitted to the Nuclear Plant Generator Operator, showing incorporation of the NPIRs. The Compliance Enforcement Authority 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 Enforcement Authority:
 - 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 Enforcement Authority, 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 Enforcement Authority, 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 Enforcement Authority**

Regional Entity.
 - 1.2. Compliance Monitoring Period and Reset Time Frame**

Not applicable.
 - 1.3. Compliance Monitoring and Enforcement Processes:**
 - Compliance Audits
 - Self-Certifications
 - Spot Checking
 - Compliance Violation Investigations
 - Self-Reporting

Complaints

1.4. Data Retention

The Responsible Entity shall keep data or evidence to show compliance as identified below unless directed by its Compliance Enforcement Authority to retain specific evidence for a longer period of time as part of an investigation:

- 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 a Responsible Entity is found non-compliant it shall keep information related to the noncompliance until found compliant.

The Compliance Enforcement Authority shall keep the last audit records and all requested and submitted subsequent audit records.

1.5. Additional Compliance Information

None.

2. Violation Severity Levels

- 2.1. Lower:** Agreement(s) exist per this standard and NPIRs were identified and implemented, but documentation described in M1-M8 was not provided.
- 2.2. Moderate:** Agreement(s) exist per R2 and NPIRs were identified and implemented, but one or more elements of the Agreement in R9 were not met.
- 2.3. High:** One or more requirements of R3 through R8 were not met.
- 2.4. Severe:** No proposed NPIRs were submitted per R1, no Agreement exists per this standard, or the Agreements 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 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 NUC-001-2 — Nuclear Plant Interface Coordination

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.

F. Associated Documents

Version History

Version	Date	Action	Change Tracking
1	May 2, 2007	Approved by Board of Trustees	New
2	To be determined	Modifications for Order 716 to Requirement R9.3.5 and footnote 1; modifications to bring compliance elements into conformance with the latest version of the ERO Rules of Procedure.	Revision
2	August 5, 2009	Adopted by Board of Trustees	Revised
2	January 22, 2010	Approved by FERC on January 21, 2010 Added Effective Date	Update
2	February 7, 2013	R9.1, R9.1.1, R9.1.2, R9.1.3, and R9.1.4 and associated elements approved by NERC Board of Trustees for retirement as part of the Paragraph 81 project (Project 2013-02) pending applicable regulatory approval.	

*** FOR INFORMATIONAL PURPOSES ONLY ***

Enforcement Dates: Standard NUC-001-2 — Nuclear Plant Interface Coordination

United States

Standard	Requirement	Enforcement Date	Inactive Date
NUC-001-2	All	04/01/2010	

A. Introduction

- 1. Title:** Nuclear Plant Interface Coordination
- 2. Number:** NUC-001-2.1
- 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 Coordinators.
 - 4.2.8** Distribution Providers.
 - 4.2.9** Load-serving Entities.
 - 4.2.10** Generator Owners.
 - 4.2.11** Generator Operators.
- 5. Effective Date:** April 1, 2010

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: Medium*]
- 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: High*]

1. Agreements may include mutually agreed upon procedures or protocols in effect between entities or between departments of a vertically integrated system.

- 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: High*]
- 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: High*]
- 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: High*]
- 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: Medium*]
 - 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 for considering, within the restoration process, the requirements and urgency of a nuclear plant that has lost all off-site and on-site AC 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 underfrequency and undervoltage 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 Enforcement Authority, 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 Enforcement Authority. (Requirement 2 and 9)
- M3.** Each Transmission Entity responsible for planning analyses in accordance with the Agreement shall, upon request of the Compliance Enforcement Authority, provide a copy of the planning analyses results transmitted to the Nuclear Plant Generator Operator, showing incorporation of the NPIRs. The Compliance Enforcement Authority 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 Enforcement Authority:

- 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 Enforcement Authority, 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 Enforcement Authority, 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 Enforcement Authority

Regional Entity.

1.2. Compliance Monitoring Period and Reset Time Frame

Not applicable.

1.3. Compliance Monitoring and Enforcement Processes:

Compliance Audits

Self-Certifications

Spot Checking

Compliance Violation Investigations

Self-Reporting

Complaints

1.4. Data Retention

The Responsible Entity shall keep data or evidence to show compliance as identified below unless directed by its Compliance Enforcement Authority to retain specific evidence for a longer period of time as part of an investigation:

- 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 a Responsible Entity is found non-compliant it shall keep information related to the noncompliance until found compliant.

The Compliance Enforcement Authority shall keep the last audit records and all requested and submitted subsequent audit records.

1.5. Additional Compliance Information

None.

2. Violation Severity Levels

- 2.1. Lower:** Agreement(s) exist per this standard and NPIRs were identified and implemented, but documentation described in M1-M8 was not provided.
- 2.2. Moderate:** Agreement(s) exist per R2 and NPIRs were identified and implemented, but one or more elements of the Agreement in R9 were not met.
- 2.3. High:** One or more requirements of R3 through R8 were not met.
- 2.4. Severe:** No proposed NPIRs were submitted per R1, no Agreement exists per this standard, or the Agreements 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 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.

F. Associated Documents

Version History

Version	Date	Action	Change Tracking
1	May 2, 2007	Approved by Board of Trustees	New
2	To be determined	Modifications for Order 716 to Requirement R9.3.5 and footnote 1; modifications to bring compliance elements into conformance with the latest version of the ERO Rules of Procedure.	Revision
2	August 5, 2009	Adopted by Board of Trustees	Revised
2	January 22, 2010	Approved by FERC on January 21, 2010 Added Effective Date	Update
2.1	April 11, 2012	Errata approved by the Standards Committee; (Capitalized “Protection System” in accordance with Implementation Plan for Project 2007-17 approval of revised definition of “Protection System”)	Errata associated with Project 2007-17