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NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

Project 2010-07: Generator Requirements at the Transmission Interface

White Paper Proposal for Informal Comment

to ensure
the reliability of the
bulk power system

March 2011

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Introduction

The Bulk Electric System¹ consists of many parts, including power plants and transmission facilities. While most transmission facilities operate as part of the overall integrated grid, a number of transmission facilities operate more like an extension cord to interconnect power plants and loads to the bulk power system.² These transmission facilities that connect power plants to the integrated grid are commonly known as generator interconnection facilities.

Power plants, and their respective pieces and parts, come in all sizes and configurations. Some plants consist of just a single generating unit, other plants consist of multiple generating units, and still others consist of multiple generating units spread over several thousand acres. While not all power plants are considered part of the Bulk Electric System, ultimately, all the plants are interconnected to the bulk power system via their generator interconnection facilities. Of concern is how to classify all such generating facilities, including their generator interconnection facilities, to determine what level of reliability is needed for such facilities.

Objective

The purpose of Project 2010-07—Generator Requirements at the Transmission Interface is to ensure that all generator-owned Facilities³ that are considered part of the Bulk Electric System are identified and that the level of reliability needed to operate such Facilities is appropriately covered under NERC’s Reliability Standards. This will be accomplished by proposing a set of changes to existing standard requirements, introducing new requirements, and, if necessary, modifying definitions of some NERC-defined terms. The collective efforts will add clarity to Generator Owners and Generator Operators regarding their reliability standard obligations at the interface with the integrated bulk power system.

Since the formation of the Project 2010-07 Standard Drafting Team (SDT) in December 2010, the SDT has focused on reworking the Generator Requirements at the Transmission Interface Ad Hoc Group’s⁴ (GOTO Ad Hoc Group) original proposed plan for addressing generator

¹The current definition of “Bulk Electric System” in the [NERC’s Glossary of Terms](#) reads: “As defined by the Regional Reliability Organization, the electrical generation resources, transmission lines, interconnections with neighboring systems, and associated equipment, generally operated at voltages of 100 kV or higher. Radial transmission facilities serving only load with one transmission source are generally not included in this definition.” This definition is undergoing significant revision under [Project 2010-17—Definition of Bulk Electric System](#).

² This paper uses the term “bulk power system” as it is defined in Section 215 of the Federal Power Act: “(A) facilities and control systems necessary for operating an interconnected electric energy transmission network (or any portion thereof); and (B) electric energy from generation facilities needed to maintain transmission system reliability. The term does not include facilities used in the local distribution of electric energy.”

³ “Facility” is defined in [NERC’s Glossary of Terms](#) as “A set of electrical equipment that operates as a single Bulk Electric System Element (e.g., a line, a generator, a shunt compensator, transformer, etc.)”

⁴ NERC formed the [Generator Requirements at the Transmission Interface Ad Hoc Group](#) in 2009 to analyze and make recommendations for establishing general criteria for determining whether Generator Owners and Generator Operators should be registered for Transmission Owner and Transmission Operator requirements in NERC’s Reliability Standards.

requirements at the transmission interface. Based on feedback from the industry, along with input from NERC and FERC staffs, the GOTO Ad Hoc Group made a series of recommendations that included changes to various reliability standards, the modification of existing definitions, and the creation of some new definitions. However, based on more recent feedback from industry and regulators, and after taking into account other standards projects under development, the SDT decided that the plan of proposing new definitions, modifying other definitions, and making changes to dozens of standards was no longer necessary.

The SDT believes it is appropriate to classify various generating Facilities and Elements (including generator interconnection facilities) as part of the Bulk Electric System. The SDT also believes that qualifying generator interconnection facilities should be classified as transmission. That does not mean, however, that a Generator Owner or Generator Operator should be required to automatically register as a Transmission Owner or Transmission Operator simply because it owns and/or operates transmission Elements or Facilities. While qualifying Generator Owners and Generator Operators can be classified as owning and operating electric transmission Elements and Facilities, these are most often not part of the integrated bulk power system, and as such should not be subject to the same level of standards applicable to Transmission Owners and Transmission Operators who own and operate transmission Facilities and Elements that are part of the integrated bulk power system.

Requiring any classification that subjects Generator Owners and Generator Operators to all the standards applicable to Transmission Owners and Transmission Operators would do little, if anything, to improve the reliability of the Bulk Electric System. When the transmission Elements and Facilities owned and operated by Generator Owners and Generator Operators are non-network/non-integrated transmission, applying *all* standards applicable to Transmission Owners and Transmission Operators would have little effect on the overall reliability of the Bulk Electric System when compared to the operation of the equipment that actually produces electricity – the generation equipment itself.

To maintain an adequate level of reliability in the Bulk Electric System, a clear delineation of responsibilities and authority at the interface between Generator Owners/Operators and Transmission Owners/Operators is needed. This can be accomplished by properly applying selected standards or specific standard requirements to Generator Owners and Generator Operators. The SDT is recommending a plan to modify the Purpose, the Functional Entity section, requirements, and measures of a selected group of standards to make them applicable to Generator Owners and Generator Operators, and to add clarity to such standards regarding generator interconnection facilities.

Note that at this stage in its work, the SDT has made no final decisions on its proposed plan; rather, it is seeking informal feedback from the industry regarding its assumptions and recommendations. Throughout the informal comment stage, the SDT plans to rely heavily on this informal input and feedback to lessen the need to expend limited industry resources on developing specific and exacting standards changes. At this informal stage, the SDT has not developed definitional changes, VSLs, VRFs, Implementation Plans, etc. for its proposed changes; those will be developed as needed once the project progresses further and proposed changes are finalized.

Proposed Next Steps and Review of Reliability Standards

The Project 2010-07 Standard Drafting Team (SDT) proposes the following recommendations to clearly identify the appropriate generation Facilities and the standards requirements that should apply to such generation Facilities to ensure that the reliability of the Bulk Electric System is maintained:

1. Add “Generator Owner” to the Applicability section of FAC-001-0 and add a requirement and a measure to address the responsibilities specific to the Generator Owner.

FAC-001-0—Facility Connection Requirements currently applies to Transmission Owners and addresses the need for Transmission Owners to establish facility connection and performance requirements. While the standard requires Transmission Owners to address connection requirements for “generation facilities, transmission facilities, and end-user facilities,” it does not address the requirements for a Generator Owner that has received a request for interconnection. The lack of such requirements for a Generator Owner’s Facility could result in gaps.

Therefore, the SDT proposes that “Generator Owner” be added to the Applicability section of FAC-001-0. It further proposes the addition of Requirement 4 and a corresponding measure:

R4. Generator Owner that receives an interconnection request for its facility shall, within 45 days of such a request, be required to comply with requirements R1, R2, and R3 for the facility for which it received the interconnection request.

M4. The Generator Owner that receives an interconnection request for its facility shall make available (to its Compliance Monitor) for inspection evidence that it met the requirements stated in Reliability Standard FAC-001-0 R4.

These proposed standard changes are redlined in Attachment 1.

Note that FAC-001-0 has been assigned for modification under Project 2010-02, but as of March 4, 2011, no activity has yet taken place on that project.

2. Add “Generator Owner” to the Applicability section of FAC-003-2 and modify the requirements and measures to include Generator Owner.

The proposed FAC-003-2 currently applies to Transmission Owners and addresses the need to maintain a reliable electric transmission system by using a defense-in-depth strategy to manage vegetation located on transmission rights of way (ROW) and minimize encroachments from vegetation located adjacent to the ROW.

A Transmission Vegetation Management Plan is used to ensure the reliable operation of electric transmission systems and prevent vegetation-related outages. Because generator-owned Facilities may include electric transmission, FAC-003-2 should be applicable to

Generator Owners. Requiring Generator Owners to adhere to the requirements in this standard will ensure that Facilities like the generator interconnecting line lead are inspected as defined in the Transmission Vegetation Management Plan and that all vegetation that breaches specified clearances is properly trimmed. This change in applicability will also ensure the proper reporting of vegetation-related outages to the appropriate Regional Reliability Organizations.

The SDT proposes that “Generator Owner” is added to all requirements and measures that mention the Transmission Owner. These proposed changes are outlined in Attachment 2.

The SDT recognizes that if these standard changes are made, changes to the accompanying FAC-003-2 definition modifications may also be needed. As noted above, such changes will be considered after informal comments are received.

3. Follow the Project 2010-17—Definition of Bulk Electric System and ensure that the responsibility for generator interconnecting line leads is appropriately and clearly assigned to Generator Owners and Operators.

The Project 2010-07 SDT recognizes that it cannot control the work of the SDT working on the definition of Bulk Electric System. Still, the Project 2010-07 SDT is hopeful that changes made to this definition will be instrumental in covering the reliability gap with respect to generator requirements at the transmission interface. At this stage in the definition’s development, Project 2010-17’s [concept paper](#) has a section on Proposed BES Criteria, and it includes the following:

3. *Generation plants (including GSU transformers and the associated generator interconnecting line lead(s)) with aggregate capacity greater than 75 MVA (gross nameplate rating) directly connected via a step-up transformer(s) to Transmission Facilities operated at voltages of 100 kV or above;*

The Project 2010-07 SDT recognizes that this concept paper is a working draft and is in no way enforceable at this time; still, the Project 2010-07 SDT is hopeful that the BES team is moving in a direction that will be complementary to its own work.

The proposed changes listed above mark a significant decrease in changes originally proposed by the GOTO Ad Hoc Group in its [Final Report](#). In particular, clarifications to the definition of Bulk Electric System eliminate the need for the GOTO Ad Hoc Group’s suggestions to include a reference to the proposed new term “Generator Interconnection Facility” in the following standards referenced in the GOTO Ad Hoc Group Final Report:

- BAL-005-0.1b
- CIP-002-1
- EOP-001-0
- EOP-004-1
- FAC-008-1
- FAC-009-1

- IRO-005-2
- MOD-010-0
- MOD-012-0
- PRC-004-1
- PRC-005-1
- TOP-002-2
- TOP-003-0
- VAR-001-1
- VAR-002-1

All of the standards listed above already apply to the Generator Owner or Generator Operator,⁵ so as long as generator-owned Facilities like generator interconnection facilities are appropriately assigned to the responsibility of those entities with changes to the definition of Bulk Electric System, there should be no need to highlight the inclusion of “Generator Interconnection Facility” with language changes in those standards.

Other proposed changes are also unnecessary. In **EOP-003-1**, the GOTO Ad Hoc Group had originally proposed that Generator Operators be added to the requirement that requires Transmission Operators and Balancing Authorities to coordinate automatic load-shedding throughout their areas. The SDT determined that this addition was unnecessary because PRC-001 already includes the requirement that Transmission Operators coordinate their UFLS programs with underfrequency isolation of generating units, which infers that Generator Operators need to provide their underfrequency settings to their respective Transmission Operator. Further, Generator Operators should not be involved in the high-level coordination that this standard requires.

In **EOP-008-0**, the proposed reference to the Generator Interconnection Operational Interface can be eliminated because the proposed term was meant to consist of Elements and Facilities rated at 100 kV and above, which the team has acknowledged are transmission.

In the cases of **PER-001-0** and **PER-002-0**, the SDT believes that additional requirements for training of Generator Owner and Generator Operator personnel should be addressed in a future project. In FERC Order 693, a directive applied “to generator operator personnel at a centrally-located dispatch center who receive direction and then develop specific dispatch instructions for plant operators under their control.” FERC directed that those Generator Operator personnel receive formal training of the nature provided to system operators under PER-005-1. FERC Order 742 confirms that the Commission has “not modified the scope of applicability of the Order 693 directive regarding generator operator training.”

The SDT has also considered proposing further modifications to **PRC-001-2** to ensure coordination of protection system information among Generator Operators and Transmission Operators and to standards **TOP-001-2**, and **TOP-003-2** (all of which are currently under development) to ensure that coordination of information among Generator Operators and Transmission Operators. The SDT has consulted with the members of the Project 2007-03—

⁵ Many have also changed significantly since the GOTO Ad Hoc Group’s review.
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Real-time Operations SDT and believes that the necessary level of coordination (including for Special Protection Systems) is covered by the requirements in the proposed new **TOP-003-2**.

In **TOP-004-2**, the GOTO Ad Hoc Group's addition of R7 (requiring the Generator Operator to operate its generator interconnection facility within its applicable ratings) is not needed because existing TOP and IRO standards require entities to operate within, or to mitigate, SOLs and IROLs at the direction of the TOP and RC.

The proposed addition of R5 to **TOP-008-1** is also unnecessary because it will be covered in the data specifications of **TOP-003-2**, R1. (TOP-008 is being retired.)

Summary and Discussion of Other Solutions

Again, the purpose of this project is to clearly identify the appropriate generation Facilities and the standards requirements that should apply to such generation Facilities to ensure that the reliability of the Bulk Electric System is maintained. The SDT recognizes that its work alone may not eliminate all reliability gaps with respect to generator-owned Facilities like generator interconnection facilities. As noted above, Project 2010-17—Definition of Bulk Electric System may have an enormous impact on the work of this SDT. We are confident that these changes we have proposed to a small number of standards, in coordination with changes to the Bulk Electric System definition, can achieve the necessary reliability, but we also acknowledge that many entities have taken advantage of solutions outside the standards process that have achieved the same effect.

On April 20, 2010, NERC Compliance published a [Public Bulletin](#) to provide guidance for situations like this, in which entities delegate reliability tasks to a third-party entity. In this bulletin, NERC Compliance emphasizes that while a registered entity may not delegate its responsibility for ensuring that a task is completed, it may delegate the performance of a task to another entity.

As is explained in the bulletin, compliance responsibility for applicable NERC Reliability Standard requirements and accountability for violations thereof may be achieved through several means, including the following:

1. **By Individual:** an entity is registered on the NERC Compliance Registry and such registered entity assumes full compliance responsibility and accountability; or
2. **By Written Contract:** parties enter into written agreement whereby:
 - a. A registered entity delegates the performance of some or all functional activities to a third party that is not a registered entity, and the registered entity retains full compliance responsibility and violation accountability; or
 - b. A registered entity delegates the performance of some or all of the functional activities to a third party, and the third party accepts full compliance responsibility for the specific functions it performs and violation accountability. In this case, there may be individual, concurrent or joint registration of the entities, depending on the nature of the contractual relationship and, in any event, only the registered entity would be held responsible or accountable by a Regional Entity or NERC; or

3. **By Joint Registration Organization (JRO):** each party is registered and is required to clearly identify and allocate compliance responsibility and violation accountability for their respective functions under applicable NERC Reliability Standard requirements.

Because the standards efforts outlined here will not take effect for a year or more, Generator Owners and Generator Operators that are concerned about their registration status should explore options like those explained above and in further detail in NERC Compliance Bulletin 2010-004.

The Project 2010-07 SDT will continue with the efforts outlined above, but will modify its proposal and ultimate actions based on feedback from the industry.