NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Technical Justification

Project 2010-07 Generator Requirements at the Transmission Interface

Background

As part of its work on Project 2010-07—Generator Requirements at the Transmission Interface, the standard drafting team (SDT) reviewed 34 reliability standards and 102 requirements to determine what changes are necessary to close a reliability gap with respect to what is commonly known as the generator interconnection Facility. The majority of these standards and requirements had been addressed in the *Final Report from the Ad Hoc Group for Generator Requirements at the Transmission Interface* (Ad Hoc Report), and additional standards have been reviewed, and will continued to be reviewed, as a result of informal discussions with NERC and FERC staffs.

The basis for standard modifications recommended by the Ad Hoc Group for Generator Requirements at the Transmission Interface (Ad Hoc Group) was a few fundamental clarifications to the definitions of Generator Owner, Generator Operator, and Transmission, along with the creation of new definitions: one for Generator Interconnection Facility and one for Generator Interconnection Operational Interface. The Ad Hoc Group proposed the addition of these two new definitions to 26 standards encompassing 29 requirements (new and old), along with some modifications to FAC-003 to make it applicable to Generator Owners under certain circumstances.

Since the publication of the Ad Hoc Report, various entities have challenged these modifications and the recommended creation of the new definitions. The SDT has developed a more focused approach than that of the Ad Hoc Group: to propose recommendations whereby radial interconnection Facilities (at or above 100 kV) that are owned and operated by generating entities will be included in a small set of standards and requirements previously only applicable to Transmission Owners. The SDT agrees completely with the Ad Hoc Group's conclusion that Generator Owners and Operators of these radial generator tie-line Facilities (at voltages equal to or greater than 100 kV) should not be registered as Transmission Owners and Transmission Operators in order to maintain reliability on the Bulk Electric System (BES).

The SDT's justification for this strategy is rooted in the very title of its standards project: "Generator Requirements at the Transmission Interface." That is, the goal and scope of the project has always been to determine the responsibilities of those Generator Owners and Generator Operators that own or operate an interconnection Facility (in some cases labeled a "transmission Facility") between the generator and the interface with the portion of the BES where Transmission Owners and Transmission Operators take over ownership and operating responsibility. These kinds of Generator Owners and Generator Operators do not own or operate Facilities that are part of the interconnected system; rather, they own and operate radial Facilities that are connected to the boundary of the

interconnected system and as such have a limited role in providing reliability compared to those that operate in a networked fashion beyond the point of interconnection.

While some argue that these interconnecting portions of a Generator Owner's Facilities could be defined as Transmission and thus require the Generator Owner and Generator Operator for the Facility to be classified and registered as a Transmission Owner and Transmission Operator, the SDT does not believe this is necessary to provide an appropriate level of reliability for the BES. Just as important, such classification and registration could actually cause a reduction in reliability. Generator Owners and Generator Operators do not need, and in some cases may be prohibited from having, a wide-area view and responsibility for the integrated transmission system. Requiring Generator Owners and Generator Operators to have such responsibilities would require significant training, would require substantially more data and modeling responsibilities, and would detract from the entities' primary functions: to own and operate their generation equipment – including any Facilities owned and operated at voltages of 100 kV or greater that connect to the interconnected system – in a reliable manner.

Additionally, the SDT believes that the industry is much more aware today of the need to include all elements (owned and operated at 100 kV or higher) of a generator Facility in the procedures and compliance program of the registered entity that owns or has operational responsibility of those elements. Industry awareness was raised substantially at the time the October 17, 2010 Facility Ratings Recommendation to Industry was issued (which included Generator Owners and specifically addressed interconnection Facilities in the Q&A document). While this applies to a specific NERC Recommendation, the SDT considers this compelling evidence that the paradigm for thinking about generator interconnection Facilities is shifting.

All of this has led the SDT to its current conclusions to modify FAC-001, FAC-003, and PRC-004. The SDT does not believe any further modifications to standards are necessary to maintain an appropriate level of reliability based on the revised assumption that while generator Facilities (at 100 kV and above) will be considered by some to be transmission, Generator Owners and Generator Operators should not be registered as Transmission Owners and Transmission Operators simply as a result of the ownership and operation of such Facilities. Because the majority of commenters support the SDT's current recommendation to not adopt new terms, the SDT has elected to focus on its standard changes and to postpone discussions on revisions to existing, or creation of new, definitions until the standards have been successfully balloted.

Below, the SDT discusses the changes it has proposed for FAC-001, FAC-003, and PRC-004 and then provides justification for not modifying any additional standards that had been proposed for substantive modification in the Ad Hoc Report.

Review of SDT's Proposed Standard Changes

FAC-001-1—Facility Connection Requirements

While some stakeholders have questioned the modifications in the proposed FAC-001-1, the SDT remains convinced that there is the potential for a reliability gap if this standard is not modified so that it applies to a Generator Owner if and when it executes an Agreement to evaluate the reliability impact of interconnecting a third party Facility to its existing generation interconnection Facility. The intent of this modified language is to start the compliance clock when the Generator Owner executes an Agreement to perform the reliability assessment required in FAC-002-1. This step is expected to occur if a Generator Owner is compelled by a regulatory body to allow such interconnection. Assuming that a regulatory body would require a Generator Owner to evaluate such an interconnection request, the SDT expects the Generator Owner and the third party to execute some form of an Agreement. The SDT intentionally excluded a specific reference to the form of Agreement (such as a feasibility study) in deference to stakeholder suggestions to avoid comingling of commercial and reliability issues in reliability standards.

The SDT acknowledges that the scenario described in the proposed FAC-001-1 may be rare, but in the past (for instance, FERC ¶ 61,109 at P. 19 and 134 FERC ¶ 61,064 at P. 13), Generator Owners have received or have been directed to execute interconnection requests for their Facilities, and the SDT thinks it is important to clarify the responsibilities related to such a request in NERC's Reliability Standards. And, while the SDT acknowledges that such regulatory action might also result in the Generator Owner being registered for other functions, such as Transmission Owner, Transmission Planner, and/or Transmission Service Provider, it decided the proposed revision provides appropriate reliability coverage until any additional registration is required and does not impact any Generator Owner that never executes an Agreement as described in the standard.

FAC-003-X and FAC-003-3—Vegetation Management

The SDT and most stakeholders agree with the Ad Hoc Group recommendation that FAC-003 be applicable to Generator Owners that own a generation interconnection if that Facility contains overhead conductors. The Ad Hoc Group originally excluded such a Facility from this requirement if its length is less than two spans (generally one half mile from the generator property line). After reviewing formal comments, the SDT agreed to revise the exclusion so that it applies to a Facility if its length is "one mile or 1.609 kilometers beyond the fenced area of the generating station switchyard" to approximate line of sign from a fixed point. Other than revising this exclusion, the SDT applied the same criteria to the Generator Owner as applies to the Transmission Owner in the current FERC approved version of this standard as well as one approved by stakeholders (under Project 2007-07) in February 2011. The SDT is communicating with NERC staff and the Project 2007-07 SDT to ensure that changes to this standard will be coordinated before submitting to NERC's Board of Trustees, but feels compelled to continue to posting both versions until the outcome of Project 2007-07 efforts is clearer.

PRC-004-2.1—Analysis and Mitigation of Transmission and Generation Protection System Misoperations

After examining all standards it had previously reviewed, the SDT elected to propose a slight change to PRC-004-2.1. While the SDT rejected other opportunities to "drop" the phrase "generator interconnection Facility" into requirements because it is not typically the best way to add clarity, in the case of PRC-004-2, the SDT fears that the phrasing of R2 ("The Generator Owner shall analyze its generator Protection System Misoperations…") could lead to some confusion about whether an interconnection Facility is included. Thus, the SDT proposes adding "and generator interconnection Facility" as redlined in the draft standard. Because there is no change in applicability, and because the SDT believes that most Generator Owners already interpret the standard in this manner, we consider this to be a minor and not substantive change employed only to add clarity.

Review of Other Substantive Standard Modifications from the Ad Hoc Report

To ensure that no reliability gaps were left when the SDT shifted its strategy from the original strategy of the Ad Hoc Group, the SDT reviewed all standards for which the Ad Hoc Group had proposed changes, and again discussed whether making these standards applicable to Generator Owners or Generator Operators would increase reliability with respect to generator requirements at the transmission interface. Below, the SDT provides its reasons for not proposing the substantive changes that were included in the Ad Hoc Report (that is, a change in applicability or new requirement, beyond simply adding the text "including its Generator Interconnection Facility" to an existing requirement). As Project 2010-07 continues, the SDT will work with FERC staff, NERC staff, and industry groups to determine if its list of proposed standards is supported industry-wide, and whether other standards need to be considered.

EOP-003-1—Load Shedding Plans

For **EOP-003-1**, the Ad Hoc Group 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 underfrequency load shedding 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 typically do not have the technical expertise or access to the data necessary for the high-level coordination that this standard requires.

IRO-005-2—Reliability Coordination – Current Day Operations

The SDT chose not to adopt the revision to **IRO-005-2** proposed by the Ad Hoc Group. This revision would have added a new requirement that would read, "The Generator Operator shall immediately inform the Transmission Operator of the status of the Special Protection System, including any degradation or potential failure to operate as expected for SPS relay or control equipment under its control." The SDT initially arrived at this decision because of the planned retirement of IRO-005-2. In subsequent meetings, the SDT also reached the conclusion that there is no reliability gap as PRC-001-1 R2 already requires the Generator Operator to notify reliability entities of relay or equipment failures.

The SDT believes that a Special Protection System is a form of protection system and therefore any degradation or potential failure to operate as expected would be required to be reported by the Generator Operator to reliability entities (Balancing Authorities, Transmission Operators, and Reliability Coordinators).

Personnel Performance, Training, and Qualifications (PER) Standards

The SDT also chose not to propose the revisions to **PER-001-0—Operating Personnel Responsibility and Authority** or **PER-002-0—Operating Personnel Training** that were proposed by the Ad Hoc Group. For PER-001-0, the Ad Hoc Group had proposed adding a new R2 that would read "Each Generator Operator shall provide operating personnel with the responsibility and authority to implement real-time actions to ensure the stable and reliable operation of the Generation Facility and Generation Interconnection Facility, and the responsibility and authority to follow the directives of reliability authorities including the Transmission Operator and Balancing Authority." To PER-002-0, the Ad Hoc Group proposed adding the Generator Operator to R1 ("Each Transmission Operator, Generator Operator, and Balancing Authority shall be staffed with adequately trained operating personnel") and adding a new R3 that would read: "Each Generator Operator shall implement an initial and continuing training program for all operating personnel that are responsible for operating the Generator Interconnection Facility that verifies the personnel's ability and understanding to operate the equipment in a reliable manner."

These proposed changes to the PER standards have little to do with responsibilities that relate specifically to a generator interconnection Facility. Issues related to the training of Generator Operators existed separately from the work of Project 2010-07, and the SDT agrees that its scope limits its efforts to standards that are directly related to generator requirements at the transmission interface. The SDT also cites past FERC Orders as proof that this issue is not within the scope of Project 2010-07. In Order 693, FERC directed NERC to "expand the applicability of the personnel training Reliability Standard, PER-002-0, to include (i) generator operators centrally-located at a generation control center with a direct impact on the reliable operation of the Bulk-Power System..." In Order 742, FERC reaffirmed this, stating that it is "not modifying the Order No. 693 directive regarding training for certain generator operator dispatch personnel, nor are we expanding a generator operator's responsibilities."

Centrally-located generator operators working at a generation control center typically dispatch the output from multiple generating units. As such, they can be called upon to comply with orders from their Balancing Authority that may have a significant impact on the reliable operation of the BES. Their training would be covered by proposed change to PER-002-0 and Order 742. Generator Operators who deal with interconnection facilities at individual generating plants, on the other hand, typically do not receive reliability-based orders specific to the interconnection Facilities and are therefore not covered by Order 742. Further, the SDT believes there is no reliability gap as Generator Operators are, under

currently approved reliability standards, required to follow directives issued by a Balancing Authority, Reliability Coordinator or Transmission Operator.

These items are clearly important ones for the Commission, but the SDT does not think it is appropriate to fold modifications to these PER standards into the scope of its work until it is specifically directed to do so. For now, modifications to PER-002-0 based on Order 693 directives are already included in NERC's Issue Database (P. 52-53) to be addressed by a future project. PER-001-0 is not addressed in the Issues Database, but the Project 2007-03 drafting team has proposed that the standard be retired.

Transmission Operations (TOP) Standards

For TOP standards, the Ad Hoc Group proposed a number of new requirements that the SDT does not see as supportive of reliability. This set of standards was somewhat difficult to analyze, as the Project 2007-03—Real-time Transmission Operations drafting team has made significant changes to TOP-001 through TOP-008, resulting in three proposed TOP standards where are currently eight (see the project's Implementation Plan). The Project 2010-07 reviewed both the FERC-approved TOP standards and the fifth draft of the modified standards in Project 2007-03 to determine whether it needed to propose any additional changes to cover radial generator interconnection Facilities. In addition, the Project 2010-07 SDT contacted the Project 2010-07 to get its opinion as to whether there might be any reliability gaps related to generator interconnection facilities. No such changes will be proposed for the reasons outlined below.

The Ad Hoc Group proposed adding two new requirements to **TOP-001-1—Reliability Responsibilities and Authority**. The first was proposed as R9 and read: "The Generator Operator shall coordinate the operation of its Generator Interconnection Facility with the Transmission Operator to whom it interconnects in order to preserve Interconnection reliability…" The SDT does not agree that this change is necessary. TOP-002-2 R3 (proposed to be covered in the future by TOP-003-2, as outlined in Project 2007-03's Implementation Plan) already requires the Generator Operator to coordinate its current-day, next-day, and seasonal operations with its Host Balancing Authority and Transmission Service Provider. These entities are, in turn, required to coordinate with their respective Transmission Operator. Additionally, TOP-002-2 R4 (proposed to be covered in the future by TOP-003-2, as outlined in Project 2007-03's Implementation Plan) requires each Balancing Authority and Transmission Operator to coordinate with neighboring Balancing Authorities and Transmission Operators and with its Reliability Coordinator. With these requirements, Generator Operators are already required to provide necessary operations information to Transmission Operators. To require the same thing in TOP-001-1 would be redundant.

The second new requirement proposed by the Ad Hoc Group for TOP-001-1 was R10, which was to read: "The Transmission Operator shall have decision-making authority over operation of the Generator Interconnection Operational Interface at all times in order to preserve Interconnection reliability." As cited above, TOP-002-2 R3 (proposed to be covered in the future by TOP-003-2, as

outlined in Project 2007-03's Implementation Plan) already requires the Generator Operator to coordinate with its interconnecting Transmission Operator. Further, TOP-001-1 R3 (proposed to be covered in the future in the proposed IRO-001-2 R2 and R3) already requires the Generator Operator to comply with reliability directives issued by the Transmission Operator. These requirements effectively give the Transmission Operator decision-making authority over operation of all generator Facilities up to the point of interconnection. To require the same thing in TOP-001-1 would be redundant.

The Ad Hoc Group also proposed a new requirement, R7, for **TOP-004-2—Transmission Operations** that would read: "The Generator Operator shall operate its Generator Interconnection Facility within its applicable ratings." The SDT does not agree that a reliability gap exists, because an operator has a fiduciary obligation to protect a Facility for which it is operationally responsible. FAC-008-1—Facility Ratings Methodology and FAC-009-1—Establish and Communicate Facility Ratings already infer that the reason for establishing a ratings methodology and communicating facility ratings to the Reliability Coordinator, Planning Authority, Transmission Planner, and Transmission Operator is "…for use in reliable planning and operation of the Bulk Electric System." Further, TOP-004-2 is proposed to be retired under the work of the Project 2007-03 drafting team. Its requirements will either be deleted or assigned elsewhere.

The Ad Hoc team proposed to add a new requirement, R5, to **TOP-008-1—Response to Transmission Limit Violations** that would read "The Generator Operator shall disconnect the Generator Interconnection Facility when safety is jeopardized or the overload or abnormal voltage or reactive condition persists and generating equipment or the Generator Interconnection Facility is endangered. In doing so, the Generator Operator shall notify its Transmission Operator and Balancing Authority impacted by the disconnection prior to switching, if time permits, otherwise, immediately thereafter." The SDT sees no reliability benefit to adding this requirement. TOP-001-1 R7 ("Each Transmission Operator and Generator Operator shall not remove Bulk Electric System facilities from service if removing those facilities would burden neighboring systems unless…") and its parts give the Generator Operator authority over its Facilities, which would include the generator interconnection Facility. If there is an outage, R7.1 requires the Generator Operator to notify and coordinate with its Transmission Operator, which is required to notify the Reliability Coordinator and other affected Transmission Operators. And as with TOP-004-2, the Project 2007-03 drafting team has proposed to deleting all of TOP-008-1's requirements and retiring the standard.

Conclusion

The Project 2010-07 SDT is confident that the changes it has proposed address the reliability gap that exists with respect to the responsibilities of Generator Owners and Generator Operations that own radial interconnection Facilities. The changes to FAC-001 and FAC-003 (and now PRC-004) have been supported by stakeholders during comment periods, and there has been no strong support for bringing other standards into the scope of this project.

That said, the SDT recognizes the success of its work depends on stakeholders, NERC, and FERC agreeing that generator requirements at the transmission interface are covered under NERC Reliability Standards, both for the sake of reliability and to prevent further unwarranted registration of Generator Owners and Generator Operators as Transmission Owners and Transmission Operators. If the SDT's work does not close the gap in the eyes of all parties, that work will have been unsuccessful, so the SDT is considering all feedback it receives with request to this project. While it is posting changes to only FAC-001, FAC-003, and PRC-004, and stands by that decision, it will continue to consider whether glossary term additions/modifications and modifications to other standards could enhance the reliability impact of this project. Based on conversations with NERC and FERC staff, and review of FERC's Order Denying Compliance Registry Appeals of Cedar Creek Wind Energy and Milford Wind Corridor Phase I (135 FERC ¶ 61,241), the SDT is discussing whether it should consider the following requirements for further review: EOP-005-1 R1, R2, R6, R7; FAC-014-2 R2; PER-003-1 R1, R1.1, R1.2; PRC-001-1 R2, R2.2, R4, R6; PRC-004-1 R1; TOP-001 R1; TOP-004-2 R6, R6.1, R6.2, R6.3, R6.4; and TOP-006-1 R3. The SDT is actively seeking stakeholder feedback as to whether, in light of these orders, it should consider additional standards and or new or modifications to existing definitions as it proceeds with its work.