

Technical Justification Resource Document

Project 2010-07 Generator Requirements at the Transmission Interface
Updated July 16, 2012

I. 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. Many 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 were reviewed as a result of 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. Given this, the SDT began efforts to address those standards that required modification to address the majority of interconnection Facilities and developed a more focused approach than that of the Ad Hoc Group: to propose recommendations whereby sole-use 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 the majority of sole-use generator interconnection 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). From the beginning, the SDT emphasized that a majority of generator interconnection Facilities consist of one or two lines interconnecting with a Transmission Owner's Facility, and the SDT believes that the majority of these Facilities are best addressed using the focused approach outlined below.

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 sole-use 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, require substantially more data and modeling responsibilities, and 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](#) with the statement that the alert applied to generator interconnection tie lines that are radial only and do not serve load “if the generator is considered part of the bulk electric system”). 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, PRC-004, and PRC-005. 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 not propose revisions to existing, or creation of new, glossary terms.

Below, the SDT discusses the changes it has proposed for FAC-001, FAC-003, PRC-004, and PRC-005 and then provides justification for not modifying any of the additional standards and requirements it has reviewed.

II. 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 (*e.g., Alta Wind I, LLC et al.*, 134 FERC ¶ 61,109 at P 19 (2011) and *Sky River, LLC*, 134 FERC ¶ 61,064 at P 13 (2011)), 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-003-3—Transmission 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 Facility 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). The SDT agrees with that intended exclusion in principle; as it discusses in the document titled "[Technical Justification Project 2010-07 Generator Requirements at the Transmission Interface](#)," the SDT recognizes that in many cases, generation Facilities are (1) staffed and the overhead portion is within

line of sight or (2) the overhead Facility is over a paved surface. Stakeholders have generally supported the rationale for exempting these Facilities because incorporating them into FAC-003 would offer no reliability benefit.

Thus, the SDT has maintained this exception language but has modified it based on stakeholder input such that it excludes Facilities shorter than one mile which have a clear line of sight from the fenced area of the generating switchyard to the point of interconnection. Specifically, section 4.3.1 of FAC-003-3 (which addresses applicable generation Facilities) now states: “Overhead transmission lines that (1) extend greater than one mile or 1.609 kilometers beyond the fenced area of the generating station switchyard to the point of interconnection with a Transmission Owner’s Facility or (2) do not have a clear line of sight from the generating station switchyard fence to the point of interconnection with a Transmission Owner’s Facility...” The SDT took into consideration all comments submitted in both formal comment periods, and believes that this exemption now adequately addresses the reliability impact for a majority of the Facilities, while balancing the efforts necessary to support the standard from all entities.

PRC-004-2.1a—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-004-2a. The SDT recognizes that generator interconnection Facilities are now widely recognized in the industry as the responsibility of Generator Owners and Generator Operators. 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-004-2a, the SDT believes 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, the SDT considers this proposed change, reflected in PRC-004-2.1a, to be a minor and not substantive change employed only to add clarity.

PRC-005-1.1b—Transmission and Generation Protection System Maintenance and Testing

In the concurrent 45-day comment and ballot period that ended in November 2011, several commenters pointed out that the wording in R1 (“...and each Generator Owner that owns a generation Protection System...”) and R2 (“...and each Generator Owner that owns a generation Protection System...”) of PRC-005-1b requires the same explicit reference to a generator interconnection Facility that was added in the proposed PRC-004-2.1a R2. The SDT agreed and modified both R1 and R2 to add “and generator interconnection Facility” as redlined in the draft standard, PRC-005-1.1b.

III. Review of Other Standards Considered by the Standard Drafting Team

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. During the 45-day concurrent comment and ballot period that ended in November 2011, stakeholder commenters encouraged the SDT to review standards cited in FERC’s Order denying the registry appeals of Cedar Creek Wind Energy, LLC and Milford Wind Corridor Phase I, LLC (135 FERC ¶ 61,241 (2011)) (June 16 FERC Order).

The SDT reviewed all of these standards and requirements again and continues to find clear and technical reliability-based reasons that support not adding Generator Owner and Generator Operator requirements to the standards. The chart below indicates where (*i.e.*, the Ad Hoc Report, or the June 16 FERC Order) the standards addressed were discussed. While the FERC Orders address specific requirements within these standards, the SDT has found it useful to address each standard as a whole. Often, requirements within a standard, or even from standard to standard, work in concert to ensure that there are no reliability gaps, whereas a review of a requirement in isolation might give the impression that there is gap.

Reliability Standard	Ad Hoc Report*	June 16 FERC Order	SDT Proposal
EOP-003-1	X		
EOP-005-1			
FAC-001-0			X
FAC-003-1 or FAC-003-2	X	X	X
FAC-014-2		X	
IRO-005-2	X		
PER-001-0	X		
PER-002-0	X		
PER-003-1		X	
PRC-001-1		X	
PRC-004-1, PRC-004-1a, or PRC-004-2a		X	X
PRC-005-1a			X
TOP-001-1	X	X	
TOP-004-2	X	X	
TOP-006-1			
TOP-008-1	X		

*This chart and accompanying document only address those standards in the Ad Hoc Report for which substantive changes (change in applicability or the addition of a new requirement) were proposed.

The SDT acknowledges that FERC has stated that the June 16 FERC Order is not intended to prejudice the work of the SDT. *See Cedar Creek Wind Energy, LLC et al.*, 137 FERC ¶ 61,141 at P 26 (2011) (“these proceedings do not prejudice NERC’s ongoing effort.”). The SDT also acknowledges that the discussion in the June 16 FERC Order is related to specific cases in which certain entities will actually be registered as Transmission Owners and Transmission Operators, a process that is distinct from the SDT’s work, which assumes that once this project is complete, Generator Owners and Generator Operators will not be automatically registered for any other functions based solely on ownership of a sole-use generator interconnection facility. The rest of this document provides the SDT’s technical justification for limiting the scope of its work to FAC-001, FAC-003, PRC-004, and PRC-005.

EOP-003-1—Load Shedding Plans (addressed in the Ad Hoc Report)

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-001-1 already includes the requirement that Transmission Operators coordinate their underfrequency load shedding programs with underfrequency isolation of generating units, which indicates that Generator Operators need to provide their underfrequency settings to their respective Transmission Operator. Since there would be no load to shed on sole-use generator interconnection Facilities, there would be no role for the Generator Operator regardless of whether the Generator Operator is required to comply with this standard or register as a Transmission Operator for the sole-use generator interconnection Facilities. 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.

EOP-005-1—System Restoration Plans

The SDT considered the application of EOP-005-1 Requirements R1, R2, R5, R6, and R7 to Generator Operators. The SDT concluded that EOP-005 does not need to be modified under Project 2010-07, largely because EOP-005-2 has already been revised (and approved by FERC)¹ to incorporate generator requirements, but also for the additional reasons outlined below.

Blackstart capability of a generating unit is unrelated to owning or operating transmission Facilities or a generation interconnection Facility. During a system restoration event, Generator Operators provide real and reactive power to the BES only at the direction of a Transmission Operator. The Generator

¹ See *System Restoration Reliability Standards*, Order No. 749, 134 FERC ¶ 61,215 (2011).

Operators are not providing Transmission Operator services through their blackstart Facilities. In addition, many units with blackstart capability are not included in a TOP System Restoration Plan.

Further, the SDT does not believe that the restoration of a single line or Facility is intended by the purpose statement of EOP-005, which reads: “To ensure plans, procedures, and resources are available to restore the electric system to a normal condition in the event of a partial or total shut down of the system” (emphasis added).

In Order No. 693, at paragraph 630, FERC approved EOP-005-1 and found that the standard:

adequately addresses operating personnel training and system restoration plans to ensure that transmission operators, balancing authorities and reliability coordinators are prepared to restore the Interconnection following a blackout. Accordingly, the Commission approves Reliability Standard EOP- 005-1 as mandatory and enforceable. In addition, pursuant to section 215(d)(5) of the FPA and § 39.5(f) of our regulations, the Commission directs the ERO to develop a modification to EOP-005-1 through the Reliability Standards development process that identifies time frames for training and review of restoration plan requirements...

FERC also specifically addressed system restoration training concerns and requirements in Order No. 693 in its review and approval of Reliability Standard EOP-005-1. In that order, FERC stated (at P 627) that personnel outside a control room should be trained in system restoration, but also that this should be included in a system restoration Reliability Standard, as follows:

627. With regard to comments that the Commission’s concerns are being addressed in NERC’s drafting of proposed PER-005-1 Reliability Standard on operator training, we note PER-005-1 only includes Requirements on the control room personnel and not those outside of the control room. System restoration requires the participation of not only control room personnel but also those outside of the control room. These include blackstart unit operators and field switching operators in situations where SCADA capability is unavailable. As such, the Commission believes that inclusion of periodic system restoration drills and training and review of restoration plans in a system restoration Reliability Standard is the most effective way of achieving the desired goal of ensuring that all participants are trained in system restoration and that the restoration plans are up to date to deal with system changes.

Thus, FERC clearly found that the existing standard EOP-005-1 adequately addressed operating personnel training and would ensure the restoration of the BES in the event of a blackout, and further directed that any modifications be addressed through the Reliability Standard Development Process.

Pursuant to Order No. 693, NERC initiated Project 2006-03, and empowered the System Restoration and Blackstart Standard Drafting Team (SRBSDT) to modify the related standards. The SRBSDT developed Reliability Standard EOP-005-2, which includes Generator Operator requirements for agreements and procedures related to system restoration. In Order 749, FERC approved EOP-005-2, which included its approval of the implementation plan for EOP-005-2.²

5. Currently effective Reliability Standard EOP-005-1 requires transmission operators, balancing authorities, and reliability coordinators to have a restoration plan, test the plan, train operating personnel in the restoration plan, and have the ability to restore the Interconnection using the plans following a blackout. In Order No. 693, the Commission directed the ERO to develop, through the Reliability Standard development process, a modification to EOP-005-1 that identifies time frames for training and review of restoration plan requirements to simulate contingencies and prepare operators for anticipated and unforeseen events . . .³

Also, in FERC Order No. 749 (at PP 10, 17), both NERC and FERC identified the modifications to EOP-005 as “improvements” to the standard, not changes necessary to close a reliability gap:

10. NERC states that the proposed Reliability Standards “represent significant revision and improvement from the current set of enforceable standards” and address the Commission’s directives in Order No. 693 related to the EOP standards. NERC explains that, among other enhancements, “[t]he proposed revisions now clearly delineate the responsibilities of the Reliability Coordinator and Transmission Operator in the restoration process and restoration planning.” NERC describes the proposed Reliability Standards as providing “specific requirements for what must be in a restoration plan, how and when it needs to be updated and approved, what needs to be provided to operators and what training is necessary for personnel involved in restoration processes. (internal citations omitted)

17. . . . By enhancing the rigor of the restoration planning process, the Reliability Standards represent an improvement from the current Standards and will improve the reliability of the Bulk-Power System. . . .

In summary, the Generator Operator blackstart requirements have already been appropriately addressed through the Reliability Standards Development Process. EOP-005-2 will become effective in 2013 as approved by both the NERC Board of Trustees and FERC. There is no existing reliability gap related to owning a generation interconnection Facility and Standard EOP-005-1.

² http://www.nerc.com/docs/standards/sar/SRBSDT_Implementation_Plan_Clean_Preballot_Review_2009March03.pdf

³ Order No. 749 at P 5.

FAC-014-2—Establish and Communicate System Operating Limits (addressed in the June 16 FERC Order)

FAC-014-2, R2 states “The Transmission Operator shall establish SOLs (as directed by its Reliability Coordinator) for its portion of the Reliability Coordinator Area that are consistent with its Reliability Coordinator’s SOL Methodology.”

In paragraph 68 of the June 16 FERC Order, FERC states that without compliance with FAC-014, R2, the entity in question could “avoid establishing the system operating limit for its line or be allowed to establish an operating limit for its line that is not consistent with the requirements of the reliability coordinator’s methodology.” (internal citation omitted). *See also* June 16 FERC Order at P 84.

The SDT does not believe that FAC-014-2 R2 should be revised to include Generator Operators. The Generator Owner is required by the FERC-approved versions of FAC-008-1 R1 and FAC-009-1 and pending FAC-008-3 R1, R2, and R6 (which has been filed for approval with FERC) to document the Facility Ratings for a Generator Owner-owned generator interconnection circuit greater than 100kV. The established Facility Rating must respect the most limiting applicable equipment rating in the circuit and must consider operating limitations and ambient conditions. The thermal or ampere rating of this circuit would equal its ampere operating limit and should be conveyed by the Generator Owner to the Generator Operator if they are not the same entity. The operating voltage limits for this circuit are established by the applicable interconnecting Transmission Owner or Transmission Operator, not the Generator Owner or Generator Operator.

Therefore, the SDT believes that adding the Generator Owner to FAC-014-2 R2 would be redundant. Moreover, the SDT is concerned that entities with limited view (only their Facility) should not be responsible for setting IROLs or SOLs as these are interconnection and system limits. The SDT believes this should be the responsibility of entities with a wide-area view, as shown in the standard today; otherwise, the SDT is concerned that reliability may be jeopardized. Commenters – including one from the Transmission Owner segment – have offered this same justification.

IRO-005-2—Reliability Coordination – Current Day Operations (addressed in the Ad Hoc Report and since retired...see IRO-005-3a and BOT-approved IRO-005-4)

The drafting team considered the applicability of this standard to generator entities, but PRC-001-1, Requirement 2, already requires the Generator Operator to notify reliability entities of relay or equipment failures. The drafting team 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). Modifying this standard would not have been necessary, but IRO-005-2 was retired in October 2011 and replaced by IRO-005-3a. IRO-005-3a does still include a requirement related to Special Protection Systems, but as with IRO-005-2, Generator Operators do not need to be added to the standard because their handling of protection systems is already addressed in

PRC-001-1, Requirement R2. IRO-005-3a will be retired when IRO-005-4 (approved by NERC’s Board of Trustees in August 2011) is approved, and IRO-005-4 has no requirements relating to Special Protection Systems. IRO-010-1a will then be the sole standard to cover those issues, in Requirements R1 and R3. While those requirements do not specifically mention Special Protection Systems, they relate to the “data specification for data and information to building and maintain models to support Real-Time monitoring, Operational Planning Analyses, and Real-Time Assessments.” If there are Special Protection Systems that exist and they impact the BES, then the Reliability Coordinator will be asking for the status and the Generator Owner or Generator Operator will be providing it.

PER Standards (PER-001-0 and PER-002-0 were addressed in the Ad Hoc Report; and PER-003-1 was addressed in the June 16 FERC Order)

The Ad Hoc Group had proposed changes to PER-001-0—Operating Personnel Responsibility and Authority and PER-002-0—Operating Personnel Training. For PER-001-0, the Ad Hoc Group 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 finds 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 No. 693 (at P 1393), 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 No. 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 changes to PER-002-0 and Order No. 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 TOP-001-1 R3 already requires Generator Operators to follow the directives of the appropriate Transmission Operators.

These training-related 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 unless it is specifically directed to do so. For now, modifications to PER-002-0 based on Order No. 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.

The June 16 FERC Order does not address PER-001-0 or PER-002-0, but it does address PER-003-1. In paragraphs 67 and 81 of the June 16 FERC Order, FERC expresses concern that operational control over the transmission line breakers owned by the entities in question are not under the control of NERC certified operators. FERC states (at P 67) that "Reliability Standard PER-003-001 requires NERC certification of all operators that have responsibility for the real-time operation of the interconnected Bulk Electric System. When switching the tie-line in or out of service, operators must have the appropriate credentials and training to properly perform the switching and coordinate the switching to prevent adverse impacts such as the introduction of faults on the system."

The SDT polled generator and transmission forum members and found that the vast majority have an existing qualification process for personnel who perform switching. The team also found that although most field personnel who actually perform the switching of an Element or Facility are not NERC certified, they do receive authorization (either directly from a NERC certified system operator or through an intermediary) just prior to executing the switching to take an Element or Facility out of service or place it into service.

The SDT can find no evidence that the kinds of training requirements for operating the breakers of the generator interconnection Facility cited in the June 16 FERC Order exist elsewhere for other entities that operate breakers on lines. For instance, Transmission Owners that are not also Transmission Operators are not required to undergo any sort of training.

PRC-001-1—System Protection Coordination (addressed in the June 16 FERC Order)

The June 16 FERC Order addresses PRC-001-1 R2, R2.2, R4 and R6. PRC-001-R2 requires notification and corrective action for relay or equipment failure. Requirement R4 requires coordination of protection systems on major transmission lines and interconnections with neighboring Generator Operators, Transmission Operators, and Balancing Authorities.

In paragraphs 64 and 78 of the June 16 FERC Order, FERC expresses concern that “there is a risk of an adverse impact on reliability if the protection relays or protection systems on the [entity’s] line are not coordinated with those on the transmission network facilities in its area.”(internal citation omitted).

Generator Operators and the scope of protection equipment for generation interconnection Facilities are already appropriately accounted for in this standard in requirement R2 and sub-requirement R2.2. The language used in R2 that applies to the Generator Operator uses the general terms “relay or equipment failures” which would include not only generator relaying, but generator interconnection relaying, in the Generator Operator’s scope as well. The Generator Operator is required to notify the Transmission Operator and Host Balancing Authority in R2.1 “if a protective relay or equipment failure reduces system reliability.” Requirement R2.2 requires the affected Transmission Operator to notify its Reliability Coordinator and affected Transmission Operators and Balancing Authorities. Thus, applying R2.2 to a Generator Operator would be redundant to R2.1. If a Generator Operator had a relay or equipment failure on its Facility, including its interconnection Facility, it would be required to report that to its interconnected Transmission Operator under R2.1. That Transmission Operator is then required to notify its Reliability Coordinator and other affected Transmission Operators and Balancing Authorities under R2.2.

PRC-001-1 R4 states, “Each Transmission Operator shall coordinate protection systems on major transmission lines and interconnections with neighboring Generator Operators, Transmission Operators, and Balancing Authorities.” A sole-use generator interconnection Facility does not constitute a major transmission line or major interconnection with neighboring Generator Operators, Transmission Operators, and Balancing Authorities. Thus, R4 should not be revised to include Generator Operators. In general, any coordination that might be required is covered by the fact that the Transmission Operator that is connected to a major transmission line or interconnection has the requirement to coordinate protection on the interconnection, and there is no reliability gap.

PRC-001-1 R6 states, “Each Transmission Operator and Balancing Authority shall monitor the status of each Special Protection System in their area, and shall notify affected Transmission Operators and Balancing Authorities of each change in status.” It is clearly the responsibility of the Transmission Operator and/or Balancing Authority to monitor the Special Protection System, as they are the entity with a wide-area view, not the responsibility of a Generator Owner/Generator Operator with a local-area view who happens to have generator interconnection Facilities in the area. The requirement focuses on the Transmission Operator and Balancing Authority monitoring the status of each Special Protection System *in their area*; there is no “area” for the Generator Operator to monitor. For these reasons, there is no need to make this requirement applicable to Generator Operators.

TOP-001-1—Reliability Responsibilities and Authority (addressed in the Ad Hoc Report and June 16 FERC Order)

The June 16 FERC Order discusses making TOP-001-1 R1 applicable to Generator Operators. With respect to R1, paragraphs 68 and 83 of the June 16 FERC Order focus on ensuring that “system operators have the authority to take actions to maintain Bulk-Power System facilities within operating limits.”

TOP-001-1 R1 states, “Each Transmission Operator shall have the responsibility and clear decision-making authority to take whatever actions are needed to ensure the reliability of its area and shall exercise specific authority to alleviate operating emergencies.” TOP-001-1 R3 appropriately requires the Generator Operator to comply with reliability directives issued by the Transmission Operator “unless such actions would violate safety, equipment, regulatory or statutory requirements.” These requirements effectively give the Transmission Operator the necessary decision-making authority over operation of all generator Facilities up to the point of interconnection. Thus, no changes to TOP-001-1 are necessary.

Additionally, the Ad Hoc Group proposed adding two new requirements to TOP-001-1. 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 TOP-001-1 needs to apply to Generator Operators in any form. 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.

TOP-004-2—Transmission Operations (addressed in the Ad Hoc Report, and the June 16 FERC Order)

The Ad Hoc Report, and the June 16 FERC Order both address the application of TOP-004-2 R6 to Generator Operators. TOP-004-2 R6 ensures formal policies and procedures are formulated to provide for coordination of activities that may impact reliability. In paragraphs 67 and 82 of the June 16 FERC Order, FERC talks about entities ensuring the development of coordination protection to coordinate switching a generator interconnection Facility in and out of service, since different entities have control over different ends of the line. FERC concludes that for the entities in question, TOP-004-2 R6 must apply.

Requirement R6 and its sub-requirements state: “R6. Transmission Operators, individually and jointly with other Transmission Operators, shall develop, maintain, and implement formal policies and procedures to provide for transmission reliability. These policies and procedures shall address the execution and coordination of activities that impact inter- and intra-Regional reliability, including: R6.1. Monitoring and controlling voltage levels and real and reactive power flows, R6.2. Switching transmission elements, R6.3. Planned outages of transmission elements, R6.4. Responding to IROL and SOL violations.”

TOP-001-1 R3 appropriately requires the Generator Operator to comply with reliability directives issued by the Transmission Operator. These requirements give the Transmission Operator the necessary decision-making authority over operation of all generator Facilities, including interconnection Facilities, up to the point of interconnection. Further, TOP-002-2 R3 requires the Generator Owner 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 Operators (also in TOP-002-2 R3). Each Balancing Authority and Transmission Operator is also then required to coordinate with neighboring Balancing Authorities and Transmission Operators and with its Reliability Coordinator (in TOP-002-2 R4). The coordination with which NERC and FERC are concerned is already addressed by these other requirements.

The Ad Hoc Group had proposed a new requirement, R7, for TOP-004-2 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 and cites the following standards to support this conclusion. The purpose statements of FAC-008-3 and FAC-009-1—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.” The SDT also notes that the purpose statements of IRO-001-1.1 and TOP-001-1a infer that the Reliability Coordinator and the TOP are given the authority and

are assigned responsibility to take appropriate actions or direct the actions of others to return the transmission system to normal (reliable) conditions.

All appropriate coordination that might be proposed by applying TOP-004-2 to Generator Operators is already addressed in other standards (TOP-001-1 R3, TOP-002-2 R3, FAC-008-3, and FAC-009-1). TOP-004-2 has been proposed for retirement under Project 2007-03—Real-time Transmission Operations, whose standards have been approved by the NERC Board of Trustees. Complementary standards TOP-001-1 R3 and TOP-002-2 R3 have also been proposed for retirement, but their requirements will be covered under proposed IRO-001-3 R2, R3, and R4 and proposed TOP -003-2, approved MOD-001-1a R1 and R2, and approved MOD-030-2 R3 (respectively).

TOP-006-1/TOP-006-2—Monitoring System Conditions

The SDT considered modification to TOP-006-1 because R3 ensures technical information is provided to the responsible personnel and R6 ensures correct and accurate data to TOP and BA. However, PRC-001-1 R1 (“Each Transmission Operator, Balancing Authority, and Generator Operator shall be familiar with the purpose and limitations of protection system schemes applied in its area”) addresses the necessary Generator Operator requirements with respect to TOP-006-2 R3. The SDT concluded that knowledge of the purpose and limitations of protection system schemes applied in its area (required in PRC-001-1 R1) constitutes knowledge of “the appropriate technical information concerning protective relays” (required in TOP-006-1 R3).

TOP-006-2 R6 states “Each Balancing Authority and Transmission Operator shall use sufficient metering of suitable range, accuracy and sampling rate (if applicable) to ensure accurate and timely monitoring of operating conditions under both normal and emergency situations.” FAC-001-1 R2.1.6 already requires the Transmission Owner’s facility connection requirements to address “metering and telecommunications.” Any generator Facility that interconnected with a Transmission Owner would have had to meet that Transmission Owner’s Facility connection and system performance requirements for metering and telecommunications. Thus, there is no reliability gap.

TOP-008-1—Response to Transmission Limit Violations (addressed in the Ad Hoc Report)

Only the Ad Hoc Report addressed TOP-008-1, and it proposed 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 interconnecting Transmission Operator, who, in turn, is required to notify the Reliability Coordinator and other affected Transmission Operators.

As with TOP-004-2, the Project 2007-03 drafting team has proposed deleting all of TOP-008-1's requirements and retiring the standard. The appropriate coordination requirements, currently addressed in TOP-001-1 R7, are addressed in the proposed TOP-001-2 R5 and proposed TOP-003-2 R5.

IV. Conclusion

The SDT has concluded that the proposed modifications to FAC-001, FAC-003, PRC-004, and PRC-005 Reliability Standards will close the reliability gaps that exist for the vast majority of the sole-purpose interconnection lines owned or operated by generating entities included in the NERC Compliance Registry.

The SDT does, however, acknowledge that some Facilities used solely to connect generators to the transmission system are more complex and therefore require individual assessment. The SDT has concluded that reliability gaps associated with such Facilities should not be addressed simply through application of all standards applicable to Transmission Owners and Transmission Operators, but instead has concluded that an individualized assessment of the impact of such a Facility on neighboring transmission Facilities is warranted. Such assessment should then be used to determine exactly which Reliability Standards and requirements should apply to that Facility and whether additional entity registration is warranted. The SDT concluded that this assessment should, at a minimum, be based upon the output of transmission planning and operating studies used by the Reliability Coordinator, Transmission Operator, and Transmission Planner in complying with applicable Reliability Standards (specifically, IRO, TOP and TPL).

The SDT would like to extend its thanks to all stakeholders who have contributed to this process – either formally or informally – and hopes that NERC and FERC will support moving this project to a successful solution that ensures that generator interconnection Facility responsibility is appropriately assigned under NERC's Reliability Standards.