

**UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION**

**Standardization of Generator Interconnection
Agreements and Procedures**

) **Docket No. RM02-1-000**
)

**COMMENTS OF THE NORTH AMERICAN ELECTRIC RELIABILITY COUNCIL
ON THE IMPACTS OF THE PROPOSED *PRO FORMA* GENERATOR
INTERCONNECTION AND OPERATING AGREEMENT AND GENERATOR
INTERCONNECTION PROCEDURES ON BULK ELECTRIC SYSTEM RELIABILITY**

I. Introduction

The North American Electric Reliability Council (“NERC”) commends the Commission for its initiative to standardize generator interconnection operating agreements and procedures. Addressing inconsistent practices and other uncertainties in the generator interconnection process is a necessary step toward enabling seamless, non-discriminatory wholesale electricity markets and encouraging an adequate and reliable long-term supply of electricity for North America. NERC also commends the group of industry representatives that worked with the Commission to develop the proposed *pro forma* agreement and procedures under very tight time constraints.

NERC’s comments are focused on the *pro forma* Standard Generator Interconnection and Operating Agreement (“IA”) and Standard Generator Interconnection Procedures (“IP”) included with the notice of proposed rulemaking and the several technical reliability provisions that are contained in those two documents. Certain of those provisions are inconsistent with existing NERC reliability standards. Other provisions in the *pro forma* IA and IP appear to incorporate portions of existing NERC reliability standards, but inexplicably omit other relevant portions. These discrepancies and inconsistencies are undoubtedly and understandably the result of the tight time frame under which industry representatives and the Commission worked to prepare the proposed *pro forma* IA and IP. Nevertheless, if these issues are not addressed now, they will

likely lead to conflicts and confusion regarding compliance with NERC reliability standards versus compliance with the requirements in individual interconnection agreements.

One approach to address these concerns could have been to structure the *pro forma* IA and IP to incorporate by reference existing reliability standards, as is done in some parts of the IA and IP, and as was done in the ERCOT generator interconnection agreement, rather than attempt to set out detailed technical reliability requirements in the IA and IP. Such an approach would also mean that individual agreements would not need to be revised when reliability standards change.

Because detailed technical reliability requirements are already proposed for inclusion in the *pro forma* IA and IP, NERC strongly recommends that the Commission afford NERC the opportunity to provide the Commission with a report containing specific language to improve the *pro forma* IA and IP from a reliability perspective. NERC understands the importance of getting to a final rule for generator interconnection standards as expeditiously as possible. Based on Chairman Wood's June 5, 2002 letter to Congressman John Dingell, NERC understands that the Commission anticipates issuance of a final rule in October of this year. On that basis, NERC believes that there is sufficient time to conduct a reliability review as suggested in these comments, and to file with the Commission no later than September 1, or such other date as the Commission determines, specific language to address conflicts and inconsistencies with NERC reliability standards. Even as these comments are being filed, NERC has assigned the lead responsibility for this reliability review effort to its Planning Committee, with support from the NERC Operating Committee, Market Interface Committee, and all related technical subgroups. If the IA and IP are to be the sources of the detailed technical reliability requirements applicable to generators, then it is critical that the IA and IP be correct. NERC is committed to working

with industry technical representatives and the Commission to resolve inconsistencies and conflicts now, and will do whatever it takes to complete its reliability review and recommendations so as not to hinder or delay the Commission's final rule.

II. Background Leading to Filing of NERC Comments

Certain aspects of the proposed rulemaking are closely related to industry standards for planning and operating reliably the interconnected bulk electric systems of North America, including the reliability standards developed and implemented by NERC. NERC has followed the Commission's initiative to standardize generator interconnection agreements and procedures since the issuance of the Advance Notice of Proposed Rulemaking ("ANOPR") on October 25, 2001. The ANOPR process and issues were reviewed by NERC's Market Interface Committee ("MIC") at its meetings in November 2001, January 2002, and March 2002. It was the observation of the MIC during the ANOPR process that the issues of debate were related primarily to the business process between the sponsor of a proposed generator project and the transmission provider to which the generator proposed to connect. During this stage of the process, the issues receiving most of the attention of the industry stakeholders were queuing rules, comparable treatment between independent producers and affiliated generators, connection products and services, allocation of costs and credits, expediting or delaying schedules, liabilities, and liquidated damages. Given that these issues were predominantly business practice and equity issues, the MIC concluded that direct participation by NERC was not necessary, and that individual stakeholder entities with vested interests in those business practice issues was sufficient. It was not until issuance of the *pro forma* IA and IP in the Notice of Proposed Rulemaking ("NOPR") on May 3, 2002 that it became apparent to NERC that specific

reliability-related technical details were being proposed for inclusion in the *pro forma* agreement and procedures.

After conducting a preliminary analysis of the proposed *pro forma* IA and IP, NERC issued on May 17 a Request for Inputs from NERC committees and the public. The Request identified 91 excerpts from the *pro forma* IA and IP that contained reliability-related requirements, and asked for comments on these specific requirements. Given the two-week response time allowed and the impracticality of scheduling special NERC committee meetings on such short notice, the inputs received were sparse. Nevertheless, those that did comment favored NERC commenting on the NOPR in two areas: (1) the need for the *pro forma* IA and IP to reference established industry standards, such as those developed through NERC, rather than including specific reliability requirements in the agreement and procedures, and (2) the need to address concerns with the specific wording of some reliability-related technical details. A small task group of industry volunteers guided and reviewed the initial drafts of these NERC comments.

On June 7, NERC's draft comments were posted for public comment. Although a few responses received were in favor of the comments as written, a large majority expressed concerns with the extent of the revisions to the *pro forma* IA and IP proposed in the draft NERC comments. Those revisions would generally have incorporated by reference applicable industry standards, such as those established by NERC, and eliminated from the *pro forma* IA and IP all specific technical reliability requirements. In response to those comments, NERC reworked its comments to narrow the focus to specific reliability issues presented in the *pro forma* IA and IP, and the steps necessary to resolve inconsistencies and conflicts between the *pro forma* IA and IP and NERC reliability standards.

In considering NERC's comments on the *pro forma* IA and IP, it is also important to recognize that because of the interconnectedness of bulk electric systems, reliability is achieved through the interactions of many entities beyond generators and transmission providers. Therefore, NERC believes that reliability standards are best developed through government-industry cooperation in which stakeholders work in an industry-based consensus process to set reliability standards that promote reliable bulk electric systems, consistent with and in support of regulatory policies for standard market design.

III. NERC Support of FERC Framework for Standardizing Interconnection Process

NERC acknowledges the extraordinary efforts of the industry participants and Commission staff during the ANOPR process and recognizes the difficulty in achieving agreement in a short time period on such a large number of contentious issues. NERC also understands and shares the Commission's frustration at the historical pace of industry consensus on uniform standards and practices that are essential to establishing a sound infrastructure for North American electricity markets. NERC believes it can best support the Commission's NOPR process by facilitating an expedited, technical reliability review of the specific reliability-related requirements of the *pro forma* IA and IP. In presenting its comments and a request for a reliability review period, it is NERC's full intention to work within the Commission's timetable for issuing a final rule on standardization of generator agreements and procedures in October 2002.

NERC was not able in the 45-day NOPR comment period to facilitate an adequate reliability review by its committees and subgroups of experts in various fields of power system operation and planning. NERC can commit to an accelerated schedule, subject to the Commission's requirements, to facilitate a comprehensive reliability review of the potential

conflicts and inconsistencies between the *pro forma* IA and IP and the NERC reliability standards. The product of this review would be specific corrective language to remedy any identified conflicts and inconsistencies. This review can be substantially accelerated since the NERC Planning, Operating, and Market Interface Committees are meeting in mid-July. In addition to the committees themselves, NERC will enlist the support of its technical subgroups, which contain a broad base of subject matter expertise. The NERC Board has assigned lead responsibility for facilitating this process to the NERC Planning Committee, and the committee leadership has already mobilized its technical subgroups to begin this review. Our short-term goal is to have at least a preliminary review of the reliability-related aspects of the *pro forma* IA and IP for presentation and discussion at the NERC standing committee meetings in mid-July.

NERC believes it would have been desirable to conduct a broader reliability review as described above earlier in the ANOPR process. That may be a lesson appropriate for the future. The issue at hand, however, is assuring that the technical requirements in the proposed *pro forma* agreement and procedures are made consistent with accepted reliability standards and do not introduce risks to bulk electric system reliability. Section V. of these comments identifies several areas of possible conflict and inconsistency, sufficient we hope to persuade the Commission to allow NERC to conduct a more thorough reliability review and to suggest corrective language.

IV. Reliability Issues within *Pro Forma* IA and IP

NERC is concerned that some of the detailed technical reliability requirements in the *pro forma* agreement and procedures may have unintended adverse reliability consequences for the following reasons:

- Some requirements and specifications may be technically flawed or incomplete, or inconsistent with the existing industry reliability standards.
- Certain engineering and operational complexities and exceptions may not be adequately addressed in the requirements.
- Proposed requirements may be stated in such a way as to constrain the ability of an industry-based reliability standards organization to adapt technical and operational standards as necessitated by changing electricity markets, technology, and existing and future operating conditions of the grid.
- Legitimate regional differences may be justified based on different physical characteristics of electric systems, but may have been inadequately addressed in the requirements.
- The entire range of reliability activities may not have been adequately considered in a specific requirement and inappropriate limitations may be placed on the coordination of planning studies and operational security studies, system modeling and data coordination, performance measures, and training and education.

NERC identifies in the next section four specific examples from the *pro forma* IA and IP in which proposed technical requirements are inconsistent or in conflict with NERC reliability standards, or which could otherwise adversely impact reliability. These examples are only representative of the kinds of conflicts and inconsistencies that NERC has identified in its preliminary review, and are intended to demonstrate the need for a more thorough but expedited review by NERC.

NERC identified a total of 91 excerpts from the *pro forma* IA and IP that are related directly to reliability. These 91 items, falling in the following six general areas, would be the

subject of the recommended reliability impact review: 1) System Study Requirements; 2) Equipment Specifications; 3) Data Requirements; 4) Operating Requirements; 5) Inspections, Audits, and Tests; and 6) Terminology.

V. Examples of Specific Reliability Issues

Four examples are provided here to demonstrate the need for further review of the potential reliability impacts of certain technical requirements specified in the IA and IP. In each case, an excerpt from the NOPR is provided followed by NERC comments.

A. NOPR Section E.1. Coordination with Affected Third Party Systems (IP § 3.5)

NOPR Excerpt: “Also, as we [the Commission] explicitly stated in Nevada Power, third-party interconnection studies and network upgrades do not apply to interconnection but to transmission delivery service.¹ So, while the generator can get interconnected to the Transmission Provider's system, it cannot deliver or may not be able to deliver all of its power for the facility until the third-party upgrades are completed.” In the order the Commission states: “The interconnection of Mirant’s facility with Nevada Power’s network, standing alone, cannot affect other transmission systems.”

NERC Comment: These statements are technically incomplete and could lead to violations of reliability criteria. The interconnection of a generator to the grid creates a new source for short circuit current through the generator itself and through the generator’s step-up transformer. These sources are not dependent on the level of output from the generator – only whether the generator is interconnected to the transmission system. Connecting a generator, irrespective of output level or delivery service, will also

¹Nevada Power Co., 97 FERC ¶ 61,227 at 62,035-36 (2001), reh'g pending.

affect the voltage profile in the area and change system impedance, thereby affecting power flows. The act of electrically interconnecting a facility to a transmission provider's network or changing the configuration of a transmission provider's network will affect third party transmission systems, with the degree of impact being a matter of physics. According to NERC Planning Standards I.C. Facility Connection Requirements (S1, M1), (S2, M2), and associated Guides, the connection of a facility or change in configuration must be studied in coordination with neighboring systems, irrespective of the provision of delivery service.

B. IA Article 9.7.3. Under-Frequency Load Shed Event

NOPR Excerpt: "The Transmission System is designed to automatically activate a load-shed program as described in the Interconnection Guidelines in the event of an under-frequency system disturbance. Generator shall implement an under-frequency set point for the Facility as described in the Interconnection Guidelines to ensure "ride through" capability of the Transmission System, to the extent allowed by equipment limitations or warranties."

NERC Comment: Coordination of generator protection with under-frequency load shedding set points is required to prevent premature disconnection of generation from the grid, which could lead to a collapse of the bulk electric system. This requirement is particularly relevant in an islanding situation, when under-frequency is a likely condition. For the load-shedding program to be effective, the under-frequency set point for a generator must not be higher than the set points for under-frequency load shedding. If generators are installed such that equipment limitations and manufacturers' warranties are acceptable exemptions for a generator not to remain on during the

frequency disturbance, then the under-frequency load shedding may not be effective in preventing the full collapse of the island. Sustaining an energized island in such a case is essential to restoring normal conditions following a disturbance and may be justification for requiring facilities, on a non-discriminatory basis, to have such capabilities.

Requirements for generator protection and coordination with under-frequency load shedding are addressed in NERC Planning Standards III.C. Generation Control and Protection (S3, M7) and associated Guides, and III.D. Underfrequency Load Shedding (S1, M1–M4) and associated Guides.

Additionally, NERC Operating Policy 5D, Separation from the Interconnection, requires that if an area disturbance makes it unsafe to operate a generator in parallel with the system, its separation or shutdown should be accomplished in a manner to minimize the time required to re-parallel and assist in restoring the system to normal. The policy also states that, if feasible, generators should be separated with some local, isolated load still connected. Otherwise, generators should be separated carrying their own auxiliaries. Plant operators should be supplied with instructions specifying the frequency and voltage below which it is undesirable to continue to operate generators connected to the system. Generators are required to provide protection to automatically separate from the system at predetermined high and low frequencies.

C. IP Article 4.4.1. and 4.4.2. Modifications

NOPR Excerpt: “Prior to the return of the executed Interconnection System Impact Study Agreement to the Transmission Provider, modifications permitted under this Section shall include specifically: (a) a reduction up to 60% (MW) of electrical output of the proposed project; (b) modifying the technical parameters associated with the

generator technology or the generator step-up transformer impedance characteristics; (c) modifying the interconnection configuration; and/or (d) any other change except to the Point of Interconnection. Prior to the return of the executed Interconnection Facility Study Agreement to the Transmission Provider, the modifications permitted under this Section shall include specifically: (a) additional 15% decrease in plant size (MW), and (b) generator technical parameters associated with modifications to generator technology and transformer impedances.”

NERC Comment: Modifying the facility interconnection configuration, generator technology, or transformer impedance characteristics, even modestly, may invalidate study results. According to NERC Planning Standards I.C. Facility Connection Requirements (S1, M1), (S2, M2), and associated Guides, the connection of a facility or change in configuration must be studied in coordination with neighboring systems. In particular, changes in the step-up transformer impedance, generator technical parameters, and plant size would impact study results of the transmission provider and third party systems.

D. IA Article 5.2. Power System Stabilizers

NOPR Excerpt: “The Generator shall procure, install, maintain and operate power system stabilizers, if and as required by the System Impact Study. Transmission Provider reserves the right to reasonably establish minimal acceptable settings for any installed power system stabilizers, subject to the design and operating limitations of the Facility.”

NERC Comment: The requirement to install a power system stabilizer is determined by regional stability criteria, validation of settings by field-testing of the excitation system, and the results of transient and small signal analyses.

VI. Conclusions and Recommendations

NERC respectfully requests that the Commission:

1. Consider that additional work may be required to ensure certain technical reliability requirements of the *pro forma* IA and IP are consistent with existing NERC reliability standards and do not present a risk to the reliability of bulk electric systems in North America.
2. Grant NERC the opportunity to conduct a more complete review of the specific reliability-related terms within the *pro forma* agreement and procedures, and to propose any corrective language that may be necessary to eliminate conflicts and inconsistencies with NERC reliability standards.
3. Request NERC to identify and report to the Commission, by September 1, 2002 or another date set by the Commission, any specific deficiencies with the requirements of the *pro forma* IA and IP that may adversely impact reliability, and to propose alternative language to address the deficiencies.
4. Consider in future initiatives involving the specification of reliability standards and business practice standards the incorporation by reference standards developed through use of open, industry-stakeholder processes, such as those provided by NERC and NAESB.

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NERC is committed to actively supporting and working with the Commission to ensure consistency between the FERC *pro forma* IA and IP, and existing and future bulk electric system reliability standards.

Respectfully submitted,

NORTH AMERICAN ELECTRIC
RELIABILITY COUNCIL

A handwritten signature in black ink that reads "David N. Cook". The signature is written in a cursive, flowing style.

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