UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

North American Electric Reliability Corporation	Docket No. RM11-20-000

COMMENTS OF THE TRANSMISSION ACCESS POLICY STUDY GROUP

The Transmission Access Policy Study Group ("TAPS") submits these comments in response to the Notice of Proposed Rulemaking[1] in which the Commission proposes to approve proposed reliability standards PRC-006-1 (Automatic Underfrequency Load Shedding ("UFLS")) and EOP-003-2 (Load Shedding Plans). In the NOPR, the Commission requested comments on several specific issues, including whether all resources required for the reliable operation of the bulk electric system ("BES"), including resources not connected to BES facilities, are adequately considered under Requirements R3 and R4 of the proposed PRC-006-1.

TAPS supports the approval of the two proposed reliability standards as written, without any changes. In particular, TAPS opposes directing the North American Electric Reliability Cooperation ("NERC") to change the standards to require Planning Coordinators to model resources not directly connected to the BES. Such a change would not increase the reliability benefit of UFLS programs.

---

[1] Automatic Underfrequency Load Shedding and Load Shedding Plans Reliability Standards, 76 Fed. Reg. 66,220 (proposed Oct. 26, 2011) FERC Stats. & Regs. ¶ 32,682 (proposed 2011) (the "NOPR").

INTEREST OF TAPS

TAPS is an association of transmission-dependent utilities in more than thirty states, promoting open and non-discriminatory transmission access.[2] As transmission-dependent utilities ("TDUs"), TAPS members have long recognized the importance of grid reliability. As TDUs, TAPS members are users of the bulk power system, highly reliant on the reliability of facilities owned and operated by others for the transmission service required to meet TAPS members' loads. In addition, many TAPS members participate in the development of and are subject to compliance with NERC Reliability Standards. Thus, TAPS is sensitive to both the need for standards to support grid reliability, as well as the need to make the standards clear and cost-effective.

Communications regarding these proceedings should be directed to:

John Twitty
Executive Director
TAPS
4203 E. Woodland St.
Springfield, MO 65809
Tel.: (417) 838-8576
E-mail: 835consulting@gmail.com

Cynthia S. Bogorad
Rebecca J. Baldwin
SPIEGEL & MCDIARMID LLP
1333 New Hampshire Ave., NW
Washington, DC 20036
Tel.: (202) 879-4000
Fax: (202) 393-2866
E-mail: cynthia.bogorad@spiegelmcd.com
rebecca.baldwin@spiegelmcd.com

I. COMMENTS

A. The proposed standard adequately considers all resources needed to ensure that UFLS programs are designed to protect the reliability of the BES

The Commission seeks comments "as to whether and how all resources required for the reliable operation of the bulk electric system, including resources not connected to

[2] Tom Heller, Missouri River Energy Services, chairs the TAPS Board. Cindy Holman, Oklahoma Municipal Power Authority, is TAPS' Vice Chair. John Twitty is TAPS' Executive Director.

bulk electric system facilities, are considered in the development of UFLS programs under Requirements R3 and R4." NOPR P 31.

The requirements of PRC-006-1 to which the Commission refers are that the Underfrequency Performance Characteristic and Overfrequency Performance Characteristic of Attachment 1 be met (Requirements R3.1 and R3.2); and that individual modeling be done of certain non-conforming generators (Requirements R4.1-R4.6).

For clarity and ease of discussion, we categorize generators as either "conforming" or "non-conforming" and as either "applicable" or "non-applicable," as follows:

1. Conforming/Non-conforming generators: To protect their components from permanent damage, generators have frequency protection that will trip when the frequency rises above or falls below predetermined thresholds for a predetermined amount of time. During an underfrequency event, an effective UFLS program sheds load before the frequency falls below those predetermined thresholds; otherwise, the generators will disconnect from the system, further exacerbating the load-generation imbalance that is causing the underfrequency event. To facilitate the design of effective UFLS programs, proposed PRC-006-1 identifies a frequency curve within which most generators will not trip.[3] A few generators, however, trip within these frequency curves. The generators that do not trip within the frequency curves are "conforming generators"; those that do are "non-conforming generators."

---

[3] The frequency curve in PRC-006-1 is the same as the frequency curve in PRC-024, which is currently in development and would require generator owners to set their protective relays to operate within the curve unless they document and communicate equipment limitations that prevent them from doing so.

2. Applicable/non-applicable generators: PRC-006-1 requires modeling of generators that are connected to the bulk electric system and are over 20 MVA for a single unit or over 75 MVA for a plant (Requirements R3.3 and R4.1-R4.6).[4] For ease of discussion in these comments, we refer to generators that fit those characteristics as "applicable generators," and to those that do not as "non-applicable generators."

Generators trip offline in over- and under-frequency situations, but the great majority (the conforming generators) do so outside the Attachment 1 curves; in other words, UFLS will come into play and remedy an underfrequency condition before the frequency gets low enough for the generator to trip offline. The trip settings for conforming generators therefore do not need to be separately modeled in designing a UFLS scheme; it is known that they conform to, or trip outside, the Generator Underfrequency and Generator Overfrequency Trip Modeling curves in Attachment 1 to PRC-006-1. The trip settings of the minority of applicable generators that trip within the curve envelope of Attachment 1 (the non-conforming applicable generators) are separately modeled, so that the UFLS design can properly account for them.

The proposed standard does not require that a UFLS program separately model the trip settings of non-conforming, non-applicable generators. These generators represent a very small percentage of the power supply; they also tend to be older, inefficient units, and as a result are very infrequently dispatched, and thus very unlikely to be dispatched at the time of a particular event. Hence, the concern is about the very small subset of generators that: (i) do not meet PRC-006-1's size and connection criteria;

---

[4] PRC-006-1's connection and size criteria for generators are the same as the Statement of Compliance Registry Criteria.

(ii) do not meet the performance curves of Attachment 1; *and* (iii) happen to be dispatched at the time of an actual underfrequency event. Separately modeling such units in the design of a UFLS program would thus have an infinitesimal reliability benefit, while imposing new compliance costs on small units that only run for a few hours a year, which would likely result in many of those units being retired, a net detriment to reliability.

Furthermore, putting our limited resources into achieving very small increases in accuracy in generation modeling will not improve the overall accuracy of the UFLS program design, and does not make sense in terms of NERC's and FERC's reliability mission. The effect of other, unavoidable, uncertainties – most notably, the initial conditions of an actual event resulting in UFLS operation (such as unit commitment, dispatch, load levels, supply/demand mismatch created by any island formation, size of the island if an island forms, whether an island forms, etc.) – is much greater than that associated with non-conforming non-applicable generation. Indeed, initial conditions of an event are the most influential of all the variables, and it is important to understand that the initial conditions are inherently unknowable because the event is in the future. Since the overall precision of a model is constrained by its least accurate variables (e.g. initial conditions), increasing the accuracy of non-conforming non-applicable generator modeling will do little if anything at all to increase the precision of the overall model. As analogy, if the least accurate variable in a formula has two significant figures, the answer cannot have more than two significant figures even if all the other variables in the formula were accurate to five significant figures.

Uncertainty, such as the uncertainty around initial conditions, is best addressed by ensuring UFLS programs are robust and flexible enough to adequately respond to differences between our forecast and what actually occurs. This robustness is achieved by using conservative assumptions in the variables that matter most to the study. For instance, Requirement R3 of PRC-006-1 requires Planning Coordinators to assume that an island forms and that there is a resulting 25% imbalance in that island, which are reasonable, conservative assumptions to design a UFLS program robust and flexible enough to address uncertainties, including the significant uncertainties related to initial conditions and the less significant uncertainties related to performance of smaller equipment (e.g. non-conforming non-applicable generators, customer motors and loads, etc.). Reliability is best served by focusing, as NERC has done, on the robustness of the UFLS program: by making conservative assumptions for major variables (such as the formation of an island where an island may not form, and a 25% supply/demand imbalance) and by robust design of the UFLS program, as opposed to incurring significant expenditures in the hope of incrementally increasing the accuracy of variables that have little or no impact on the precision of the results (such as non-conforming non-applicable generation).

B. The proposed standard properly accounts for generators that trip prior to the initiation of UFLS

The Commission seeks comments on how non-conforming generators should be accounted for in UFLS programs. NOPR P 43. As described above, the proposed standard accounts for applicable non-conforming generators by requiring that their trip settings be separately modeled; the UFLS program is then designed taking into account the non-conforming generation, such that it is not necessary for the loss of the applicable

non-conforming generation to be further accounted for.[5] TAPS believes that this is the appropriate approach, and urges the Commission to approve the standard as written.

If the Commission were nevertheless to direct changes to how the standard accounts for non-conforming generators, it should not, as suggested by the example in the NOPR at Paragraph 43, require that non-conforming generators "procure load to shed to account for the loss in generation." The Commission should not prescribe a one-size-fits-all market/contractual solution for inclusion in a reliability standard, particularly given the absence of a demonstrable and significant reliability problem. As well as being unnecessary, such a scheme would raise market power concerns by effectively requiring generators to contract with load in a localized area (i.e. within the study island, which may in actuality never form), and could interact with what the Commission is doing in Orders 745 and 745-A.[6] Moreover, generators may be unable to procure equivalent load to shed within their islands. Some regional programs have very small islands, and all of the load covered by automatic and manual UFLS, as well as all critical load (e.g. hospital, emergency sites, etc.), will be ineligible for compensatory load shedding. Thus, for some generators, it will be difficult, if not impossible, to procure compensatory load to shed at any price. It would also be prohibitively complex and expensive to implement a compensatory load shedding scheme based on the false premise that UFLS programs require an extremely high degree of precision. If that degree of accuracy were in fact needed, then the load to be shed would need to match, within a certain tolerance, the real-

---

[5] As explained in Section III.A above, *non-applicable* non-conforming generation is not a significant factor in design of a UFLS program.

[6] Demand Response Compensation in Organized Wholesale Energy Markets, Order No. 745, 76 Fed. Reg. 16,658 (Mar. 24, 2011), FERC Stats. & Regs. ¶ 31,322 (2011) ("Order 745"), *clarified*, Order No. 745-A, 137 FERC ¶ 61,215 (2011) ("Order 745-A").

time output of the non-conforming generator. For example, if the generator were off-line, then the load shedding would have to be disarmed; if the generator were providing load following service, the load shedding would have to be constantly adjusted. The unintended consequence would be to disable a class of generators from providing regulation service which, given the lack of a demonstrated reliability need, would be unduly discriminatory. For these reasons, the Commission should not require compensatory load shedding.

C. Elimination of Requirements of Balancing Authorities in EOP-003-2

The Commission asks why Requirements R2, R4, and R7 of the currently effective EOP-003-1, which apply to Balancing Authorities, were not incorporated into the proposed Reliability Standards. NOPR P 52. TAPS believes that the proposed standards correctly assign those responsibilities to Planning Coordinators. The currently effective standards assign overlapping responsibilities to Balancing Authorities, Transmission Operators, and Regional Reliability Organizations. For example, PRC-006-0 R1 and EOP-003-1 R2 require both Balancing Authorities and Regional Reliability Organizations to develop plans for underfrequency load shedding. The proposed PRC-006-1 and EOP-003-2 clarify these requirements and assign them to the functional entity best suited to program design.

The Commission also asks "why balancing authorities should not be informed of UFLS program plans that directly impact balancing authority functions." NOPR P 52. TAPS believes that PRC-001-1 R1, which states "Each Transmission Operator, Balancing Authority, and Generator Operator shall be familiar with the purpose and

limitations of protection system schemes applied in its area," ensures that Balancing Authorities are properly informed of UFLS programs.

D. Implementation Plan and Effective Date

The Commission asks "about any potential reliability gaps that may occur during the development and implementation of PRC-024-1, such as how the planning coordinators will adequately determine and apply UFLS simulations and plans in the absence of generator trip settings." NOPR P 60. TAPS believes that the Planning Coordinators have the ability to run UFLS simulations despite the fact that modeling generator trip settings is not currently mandatory, because many if not all significantly sized generators are already included in the models. Although it is possible that trip settings for some non-conforming generators will not be modeled, incremental improvements in model accuracy will not have a significant impact on improving the reliability of the BES, as described more extensively above. Hence, TAPS believes that any perceived reliably gap during implementation is small.

CONCLUSION

For the foregoing reasons, the Commission should approve the proposed reliability standards as proposed by NERC.

Respectfully submitted,

/s/ Rebecca J. Baldwin

Cynthia S. Bogorad
Rebecca J. Baldwin

Attorneys for
Transmission Access Policy Study Group

Law Offices of:
Spiegel & McDiarmid LLP
1333 New Hampshire Avenue, NW
Washington, DC 20036
(202) 879-4000

December 27, 2011