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

| | | |
|---|---|---|
| **Automatic Underfrequency** | **}** | |
| **Load Shedding and Load Shedding** | **}** | **Docket No. RM11-20-000** |
| **Plans Reliability Standards** | **}** | |

**COMMENTS OF NEW YORK INDEPENDENT SYSTEM OPERATOR, INC.**

The New York Independent System Operator, Inc. ("NYISO") respectfully submits these comments in response to the Federal Energy Regulatory Commission's ("Commission") Notice of Proposed Rulemaking ("NOPR") issued in the above-captioned docket on October 20, 2011.

In the NOPR, the Commission proposes to approve Reliability Standards PRC-006-1 (Automatic Underfrequency Load Shedding) and EOP-003-2 (Load Shedding Plans).[1] The NYISO appreciates the opportunity to submit comments on this issue and supports the Commission's proposal to approve the Reliability Standards and related Violation Risk Factors and Violation Severity Levels, implementation plan, and the effective date proposed by the North American Electric Reliability Corporation ("NERC").

## I. Background

Blackouts in 1965, 1977 and 2003 have heightened the level of interest in the Northeast for the development of stability limits for key interfaces, the resulting island formation when the system breaks up across those interfaces, and the UFLS requirements to stabilize those islands. The Northeast Power Coordinating Council ("NPCC"), the regional reliability organization, has been at the forefront of developing coordinated UFLS programs and establishing a regional

[1] *Automatic Underfrequency Load Shedding and Load Shedding Plans Reliability Standards*, 137 FERC ¶ 61,067 (2011).

standard on UFLS. The NYISO is one of five Reliability Coordinators participating in the NPCC UFLS coordination efforts.

The NYISO has used an in-depth, stability limits approach to New York Control Area ("NYCA") system modeling since its inception. The NYISO maintains stability limits for seven internal transmission interfaces, as well as the interfaces with each of its neighboring Control Areas. The NYISO has clearly identified, and constantly monitors, the stability limits on the interfaces where system separation is likely. During the 2003 blackout the system separated and islands formed on the interfaces evaluated.

The NYISO supports the Commission's efforts to encourage other control areas to analyze stability limits. UFLS plans should be developed on a regional basis for locations where islands are expected to form. The comments below reflect the structures and tools the NYISO employs to ensure the stability of the NYCA and the region's bulk-power system. The NYISO applauds NERC and the Commission for adopting the stability assurance methods long used by the NYISO and NPCC.

## II. Comments

In Paragraph 26 of the NOPR the Commission "addresses or seeks comments" from interested persons on aspects of the proposed Reliability Standards. The NYISO's responses to issues (A) through (I) follow:

(A) impact of resources not connected to the bulk electric system;

Analysis of UFLS effectiveness is conducted on a Multiregional Modeling Working Group (MMWG) dynamics model of the Eastern Interconnection, which includes all resources on the system, regardless of bulk system connections. Most small units do not have dynamics data in the MMWG case and typically are netted against load prior to initializing the dynamic simulation. Generic generator data is added to the model for these units within the NPCC region. The primary quantity of interest during under-frequency conditions is the inertia provided to the system by these units. Netting these units against load results in a pessimistic response with higher than expected rates of

frequency decline and a lower minimum frequency at which frequency decline is arrested.[2]

(B) validation of power system models used to simulate ULFS programs;

The power system models that the NYISO uses to simulate UFLS programs are the same models it uses to evaluate stability limits on all NYCA internal and external interfaces. The risk of system instability (which would be a precursor to UFLS activation) is the overriding concern.

While the lack of accuracy in modeling a unit's governing response may have a minimal impact on typical studies of rotor angle stability, the impact on analysis of under-generated islands can be significant. Optimistic models of unit governing response can lead to invalid conclusions regarding minimum frequency and frequency recovery, with the impact on the latter being most significant.

Prior to the most recent Underfrequency Load Shedding Adequacy study, the NPCC surveyed units on their governor response. Going forward, the NPCC plans to disable turbine-governor models on units observed to be unresponsive to frequency deviations in real-time operations and adjust the droop on remaining governors to align the system frequency response in the dynamics model to observed system response. This approach will provide improved accuracy for modeling the level at which frequency decline is arrested in islands.

In the long-term, NPCC proposes 1) to pursue the collection of unit governing response data from generating unit owners that did not respond to the survey, and 2) that an NPCC Working Group be assigned the task of incorporating unit load controller response into the NPCC basecase library. This effort will improve the accuracy of modeling frequency recovery.

(C) scope of UFLS events assessments;

The NPCC conducts UFLS assessment on a regional basis. Such information is used by the NYISO and NPCC for UFLS analysis and planning.

(D) impact of generator owner trip settings outside of the UFLS program;

The NYISO conducts an annual survey of all generator owners within the NYCA for their UFLS trip settings and addresses those that have settings outside the UFLS program range established by the NPCC. The New York load shedding model includes 260 MW of compensatory load shedding uniformly distributed across the zones in which the noncompliant generation is located. Each island is simulated twice. The first simulation models load shedding at criteria trigger levels without tripping of non-conforming generation. These simulations assess the adequacy of the NPCC Criteria. The second simulation models the UFLS with compensatory load shedding and additional load shedding blocks in New York and the Maritimes with tripping of non-conforming

[2] *2006 Assessment of Underfrequency Load Shedding Adequacy, Part II Supplemental Assessment,* SS-38 Working Group on Inter-Area Dynamic Analysis, March 6, 2008

generation. These simulations assess the adequacy of the UFLS program as implemented.[3]

(E) UFLS program coordination with other protection systems;

Due to the distributed nature of UFLS, there should not be any significant interaction between fault clearing protections and UFLS. Under-voltage inhibition of relays is not expected to interfere with operation of the UFLS program. Voltage low enough to inhibit UFLS relay operation was not observed coincident with under-frequency conditions requiring load shedding in the NPCC analysis.[4]

(F) identification of island boundaries in UFLS programs;

The NYISO regularly conducts stability evaluations on a NYCA and regional basis and is well aware of the potential breakpoints on the system. Actual system break-ups in 2003 confirmed these studies.

(G) automatic load shedding in PRC-006-1 and manual load shedding in EOP-003-2;

Manual load shedding is an operator tool used for addressing gradual and observable exceedances in system control parameters. Manual load shedding is too slow to be of value in responding to sudden and massive load imbalance. In 2003 there were only seconds between the local indication of significant frequency imbalance and system breakup. Accordingly, UFLS and Manual Load Shedding should be addressed in separate standards.

(H) elimination of balancing authority responsibilities in EOP-003-2;

The NYISO agrees that balancing authorities have no role in load shedding. Accordingly, the NYISO agrees with FERC's proposal to remove UFLS references from NERC Reliability Standard EOP-003-2.

(I) the "Lower VSL" for Requirement R8 and the "Medium" VRF for Requirement R5 of PRC-006-1.

The NYISO agrees with the Commission's efforts to establish and maintain consistency among reliability standards and supporting definitions.

## III. Communications and Correspondence

All communications in this proceeding should be directed to:

Robert E. Fernandez, General Counsel
Raymond Stalter, Director of Regulatory Affairs
*Kristin A. Bluvas, Attorney
New York Independent System Operator, Inc.

[3] ibid
[4] ibid

10 Krey Boulevard
Rensselaer, NY 12144
Tel: (315) 356-8540
Fax: (315) 356-7678
rfernandez@nyiso.com
rstalter@nyiso.com
kbluvas@nyiso.com

*Persons designated for receipt of service in this proceeding.

## IV. Conclusion

The NYISO appreciates the opportunity to provide input to the Commission regarding the NYISO's methodologies for analyzing and establishing system stability within the NYCA and the regional bulk-power system. The NYISO respectfully requests that the Commission accept these comments in support of the adoption of NERC Reliability Standards PRC-006-1 and EOP-003-2.

Respectfully Submitted,

/s/ Kristin A. Bluvas
Kristin A. Bluvas
Attorney
New York Independent System Operator, Inc.
10 Krey Boulevard
Rensselaer, NY 12144

December 22, 2011

## CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document upon each person designated on the official service list compiled by the Secretary in this proceeding in accordance with the requirements of Rule 2010 of the Rules of Practice and Procedure, 18 C.F.R. §385.2010.

Dated at Rensselaer, NY this 22th day of December, 2011.

*/s/ Joy A. Zimberlin*

Joy A. Zimberlin
New York Independent System Operator, Inc
10 Krey Blvd
Rensselaer, NY 12114
(518) 356-6207