UFLS Regional Reliability Standard Characteristics

NERC, as the Electric Reliability Organization (ERO), will direct each Regional Entity to develop a regional reliability standard (Standard) with requirements for automatic Underfrequency Load Shedding (UFLS) programs. The regional Standards will require that UFLS programs arrest declining frequency and assist recovery of frequency following a frequency excursion. Each regional UFLS Standard shall specify, as a minimum, requirements that conform to the following:

1. The Standard shall specify the entity(s) responsible for determining the system boundaries and conditions for which the performance characteristics of item 4 below shall apply.

2. The Standard shall specify the entity(s) responsible for identifying potential islands within its region or between its region and neighboring regions for which the performance characteristics of item 4 below shall apply. The Standard shall require that these islands be identified either through system studies or actual system operations, and may also include other islands as deemed appropriate by the specified entity(s) as a design basis for UFLS.

3. The Standard shall specify that the entity(s) responsible for identifying potential islands between its region and neighboring regions in item 2 above shall develop a procedure for coordinating with neighboring entities in identifying and reaching agreement on potential islands between its region and neighboring regions. The procedure shall identify how the neighboring entities will assist in the UFLS studies and analyses and provide concurrence of study results.

4. The Standard shall specify the technical design parameters required to meet the following performance characteristics for underfrequency conditions resulting from an imbalance between load and generation of at least 25 percent within an interconnection, region, or identified island(s) within or between regions:

    4.1. Arrest frequency decline at no less than 58.0 Hz.

    4.2. Frequency shall not remain below 58.5 Hz for greater than 10 seconds, cumulatively, and shall not remain below 59.5 Hz for greater than 30 seconds, cumulatively.

    4.3. Frequency overshoot resulting from operation of UFLS relays shall not exceed 61.0 Hz for any duration and shall not exceed 60.5 Hz for greater than 30 seconds, cumulatively.

    4.4. Control Bulk Electric System voltage during and following UFLS operations such that the per unit Volts per Hz (V/Hz) does not exceed 1.18 for longer than two seconds cumulatively, and does not exceed 1.10 for longer than 45 seconds cumulatively.

5. The Standard shall coordinate with PRC-024 Generator Performance During Frequency and Voltage Excursions by requiring that UFLS programs complete execution before generators begin to trip on underfrequency. Generator underfrequency trip settings are not subject to this directive.

6. The Standard shall specify how generators that are non-compliant with the PRC-024 underfrequency tripping requirement shall avoid jeopardizing UFLS effectiveness, or how

entities responsible for designing UFLS shall compensate for any non-compliant generators in their area to avoid jeopardizing UFLS effectiveness. The Standard shall require modeling of these method(s) in the UFLS assessment specified in item 10 below to ensure UFLS effectiveness is not jeopardized.

7. If the Regional Entity does not maintain its UFLS database, the Standard shall specify the entity(s) responsible for creating and maintaining a UFLS database. The Standard shall require that the responsible entity provide the UFLS database to the Regional Entity and NERC within 30 calendar days of a request.

8. The Standard shall specify the entity(s) responsible for providing data at least every five years to support maintenance of the database specified in item 7 above and shall specify what data to provide.

9. The Standard shall specify the entity(s) responsible for owning, installing, and setting UFLS equipment.

10. If the Regional Entity does not perform a UFLS assessment, including the following requirements, then the Standard shall specify the entity(s) responsible for performing a UFLS assessment.

    10.1. The Standard shall require that the UFLS assessment shall verify through dynamic simulation that the implementation of the Standard is adequate to meet the performance characteristics in item 4 above for the system boundaries and conditions specified in accordance with item 1 above and for the identified islands specified in accordance with item 2 above.

    10.2. The Standard shall require that the responsible entity conduct a UFLS assessment at least once every five years, and shall specify any conditions under which the responsible entity must conduct the assessment at more frequent intervals.

    10.3. The Standard shall require that the responsible entity provide the assessment results to the Regional Entity and NERC within 30 calendar days of a request.

11. The Standard shall require that the entity(s) responsible for owning, installing, and setting UFLS equipment, in accordance with item 9 above, shall annually certify that the amount of load it expects to shed during a system event which results in system frequency excursions below the initializing set points of the regional UFLS standard.