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Summary of Comments Rejected – by Issue (October 21, 2009) Draft 3a of SERC Underfrequency Load Shedding (UFLS) Regional Reliability Standard (PRC-006-SERC-01)

This document contains a summary of rejected comments (sorted by issue) submitted on Draft 3a of the SERC Underfrequency Load Shedding (UFLS) Standard. Draft 3a was posted on the SERC web site for comments from September 15 through October 15, 2009.

Comment Form Questions:

1. Do you agree with the time horizons assigned to each requirement?
2. Requirement R1 was revised to require development of criteria for selection of islands and to make it consistent with expected revisions in the draft NERC UFLS Standard. Do you agree with the revisions to R1?
3. Requirement R3 was revised to require performance criteria be met at not only 25% imbalance between load and generation, but also at 15% and 20%. The frequency criterion was changed to a curve to make it consistent with expected revisions in the draft NERC UFLS Standard. Do you agree with the revisions to R3?
4. Requirement R4 was revised to specify items to model for dynamic simulations. This was done to make it consistent with expected revisions in the draft NERC UFLS Standard. Do you agree with the revisions to R4?
5. Requirement R5 had major revisions to change the prime responsibility for implementing a UFLS scheme to Transmission Owners that have an agreement to provide UFLS for a Distribution Provider and to Distribution Providers that do not have an agreement with a Transmission Owner to provide UFLS. This was done to make it consistent with expected revisions in the draft NERC UFLS Standard. Do you agree with the revisions to R5?
6. Various revisions were made to requirements R6 through R8 to make them consistent with expected revisions in the draft NERC UFLS Standard. Do you agree with the revisions to these requirements?
7. Do you agree with the revisions to the measures? If not, please provide suggested changes.
8. Do you agree with the Violation Severity Levels (VSLs)? If not, please provide suggested changes.
9. Do you have additional comments on any item(s) not addressed in Questions 1 through 8?
10. (A) Do you generally support the standard; (B) are you unsure whether you generally support the standard; or (C) do you definitely not support the standard? Please check the appropriate box below. If your response is either (B) or (C), please explain your major concern(s) with the standard, including which specific requirement or set of requirements causes you the most concern and why.

Applicability issues:

- **Mark Kuras, PJM (Q-2):** Transmission Planners should not be assigned this responsibility. The NERC Functional Model (V4) designates UFLS design to Distribution Providers.
Response: The Functional Model uses the phrase “design the UFLS system” as a distribution function. The SDT believes that this refers to implementation of the UFLS scheme, not the design of the scheme. This responsibility has been assigned to the PC in the NERC draft standard. The functional model does not preclude the TP or PC from performing this task.

- **SERC EC Planning Standards Subcommittee and James Manning/Bob Beadle, NC Electric Membership Corporation (Q-5):** We have concerns about the language use regarding the use of an agreement between the TO and the DP. Is this a formal agreement or otherwise or should it be? Agreements carry with them legal implications which may not have been intended by the SDT. We think that the prime responsibility should remain as it currently existed or it should specifically be as provided in the draft NERC UFLS standard. Please explain the use of agreement between the parties involved.
Response: The use of the term "Transmission Owner that has an agreement to provide UFLS for a Distribution Provider" comes from the latest draft of the NERC UFLS Standard. The DP is responsible unless it has come to an agreement with a TO to provide some UFLS. The form of the agreement (whether formal or informal) is up to the entities involved.

- **SERC EC Planning Standards Subcommittee and James Manning/Bob Beadle, NC Electric Membership Corporation (Q-5):** Also, we disagree with the omission of the Load-Serving Entity in this standard and this requirement. This is not in keeping with the Functional Model. The LSE on behalf of the DP must design and constantly monitor the UFLS scheme for the DP to carry out to insure that it meets the requirements in the same manner that the TP designs in requirement 3 of this draft standard for the TO. Not the LSE, not the individual DPs we represent will be working closely with the TP and TO to coordinate a UFLS plan for the entire TP area which we are OK with. The LSE needs to be involved and kept in this standard in our opinion.
Response: The SDT disagrees. According to the Functional Model (Version 4 and redline of Version 5), LSE's participate through identification of critical customer loads that are to be excluded from the load shedding systems. They do not own or set UFLS relays.

- **Mark Kuras, PJM (Q-5):** Transmission Owners should not be assigned this responsibility. The NERC Functional Model designates UFLS implementation to Distribution Providers. If a Transmission Owner serves load at transmission voltages, they are a Distribution Provider. From the NERC Functional Model V4 DP section - The Distribution Provider delivers electrical energy to the End-use Customer and the transmission system. For those End-use Customers who are served at transmission voltages, the Transmission Owner may also serve as the Distribution Provider. Thus, the Distribution Provider is not defined by a specific voltage, but rather as performing the Distribution function at any voltage. The Distribution Provider provides the switches and reclosers that could be used to shed load for emergency action.

Response: The SDT disagrees. The Function Model does not preclude a TO from implementing UFLS in agreement with a DP. Such agreements are in effect in the Eastern Interconnection. This is consistent with the applicability for the latest draft of the NERC UFLS standard.

- **Jalal Babik, Lou Roeder, Jack Kerr, Kirit Doshi, Louis Slade; Dominion (Q-): 3)**
Applicability issue - Applicability of this requirement to generator owner is not consistent with the SAR upon which the proposed standard is predicated.

Response: The SAR included the following note: "NOTE: The RSS may find it necessary to modify the initial reliability function responsibility assignment as a result of the standards development and comments received". The SDT believes the standard should be applicable to Generator Owners.

- **Alan Beckham, Calpine Corporation (Q-6):** Applicability – the requirements included in R6 should not retroactively apply to existing generators. While it's agreed that additional load shedding must take place where generator performance cannot meet the standard, it shouldn't be the Generator Owner's responsibility to provide that load shedding if the generator was fully compliant with all applicable standards at the time of installation. When major pieces of equipment become out of compliance due to changes in standards, it's common that the equipment is "grandfathered" until the equipment is replaced or a major upgrade takes place. Since the time to design and construct a power plant spans many years, an existing generator should include generators in operation, construction or generators that have an executed purchase agreement at the time the standard is approved.

Response: The SDT disagrees. Generating units have historically had an implied obligation to aid in halting the decay of frequency and to actively participate in frequency recovery. The bulk power system has evolved with this design requirement as a given for generators. The proposed standard is not so much "creating a new requirement" as it is codifying specific performance objectives which, by and large, are consistent with historical practices. Furthermore, the frequency support obligation of generators is a keystone principle upon which grid reliability is based. The commenter's proposal would virtually exempt all generators from this obligation, to the detriment of grid reliability.

Coordination with entities outside the region issues:

- **None this posting**

Data collection issues:

- **Greg Mason, Dynegy (Q-6):** Also, for R7, Generator Owners do not routinely change their frequency settings as do Distribution Providers and Transmission Owners. Generator Owners should only be required to submit frequency settings when they change. Generator Owners should not be required to annually submit their frequency settings.

Response: The SDT believes it is better to have a positive response from the GO than it is to assume that no response means no change.

- **Jose Medina, NextEra Energy Resources, LLC (Q-6):** NextEra questions whether providing UFLS settings annually is of value. Once established, UFLS settings do not tend to change over time; therefore, establishing a minimum annual data collection frequency would likely be duplicative in nature. NextEra believes that the R7 requirement could be improved by simply allowing SERC to request it as and when desired. If at first it wished to collect data annually as part of its implementation monitoring mechanism, it could do so under its authority to request the data at any time. NextEra agrees that a 30-day response time is adequate for providing this data.

Response: The SDT agrees with the commenter that UFLS settings do not tend to change by a large amount from year to year. However, the SDT believes that the annual frequency is appropriate for a number of reasons. First, the UFLS schemes are based on a percentage of system or area load. Load information is typically updated on an annual basis. Therefore, it is appropriate to review the applicable UFLS percentages against this new load information. Secondly, having a database in place that is reasonably up to date will greatly aid in any investigations of disturbances which may have triggered UFLS operations.

- **Greg Mason, Dynegy (Q-8):** VSLs for R7 should only range from Low to Moderate because R7 pertains to data collection.

Response: VRF describes the importance of the requirement to reliability, which is set to Lower. The VSL describes how well the measurement was met. Therefore the VSL ranges are appropriate.

Generator coordination requirements issues:

- **Greg Mason, Dynegy (Q-6):** R6 is not consistent with the R5 of draft NERC Standard PRC-024-1. Dynegy recommends that Requirement R6 be modified to be consistent with Requirement R5 of the current draft on NERC Standard PRC-024-1. NERC Standard PRC-024-1 provides that if the Generator Owner's frequency settings cannot coordinate with the frequency performance requirements due to technical limitations, the Generator Owner is granted an exemption from meeting the underfrequency tripping requirements and the associated Planning Coordinator, Distribution Provider, and Transmission Owner takes into account the unit's limitations in their modeling and development of their UFLS program.

Response: The SERC standard is not inconsistent with R5 of PRC-024. R5 states that the GO is granted an exemption from having to reset its underfrequency tripping relays. PRC-024 is silent regarding providing compensatory load shedding.

- **Greg Mason, Dynegy (Q-6):** Generator Owners should not be required to arrange for additional load shedding in this circumstance. They have no such authority and other entities have no obligation to respond to such requests.

Response: The requirement for providing compensatory load shedding is not unique to the SERC standard. Drafts of other regional standards include similar requirements. The GO should provide an adequate incentive to the TO or DP to provide additional load shedding. As stated by another commenter to draft 2 of this standard: "If the requirements cannot be met, the GO also has the option to change protection settings, modify its turbine to meet the requirements, or arrange for additional load shedding."

- **Jalal Babik, Lou Roeder, Jack Kerr, Kirit Doshi, Louis Slade; Dominion (Q-6):** We continue to disagree with R6 and its sub-requirements. Generator Owners should only be required to provide UF settings (and technical justification for same) for non-conforming to Transmission Planners for use in development of their UFLS scheme. From comments filed in previous drafts: Dominion opposes this requirement for a number of reasons. It seems to be going beyond the intent of an UFLS scheme, which is to be the last line of defense to prevent system collapse and is attempting to address equitability. Equitability does not belong in a reliability standard. The requirement is not well thought out, and it introduces a number of issues

Response: The SDT continues to believe that R6 is not going beyond the intent of a UFLS scheme. It is accounting for the fact that some generators may trip due to their UF relays. Additional load shedding is needed for this and making the generator responsible for additional load shedding is the most appropriate way to do this.

- **Jalal Babik, Lou Roeder, Jack Kerr, Kirit Doshi, Louis Slade; Dominion (Q-6): (1)** Implementation issues - load shed service does not currently exist, may require modification to existing tariffs, raises jurisdictional issues (state vs. federal), and Code/Standards of Conduct concerns. If load shedding was required to be provided by Dominion as a non-tariff service to the generation affiliate, the same service would have to be offered to non-affiliates in accordance with North Carolina and Virginia Codes of Conduct. If load shedding was provided as an OATT service, it would fall under FERC jurisdiction. Such a service cannot be created by Dominion simply in response to a SERC requirement that is based on NERC standard "characteristics". It is more complicated than that. We also question how a Transmission Owner or Distribution Provider would defend before its utility commission the assignment of some customer loads to trip for non-coordinating generators in addition to the customer loads already designated to be tripped by UFLS schemes.

Response: The SDT does not believe that shedding load becomes an OATT issue. Additional load shedding is necessary to account for non-coordinating generators. If that additional load shedding is made the responsibility of the DP/TO rather than the generator, the same issue is there. The defense would be that this is required by an enforceable standard.

- **Jalal Babik, Lou Roeder, Jack Kerr, Kirit Doshi, Louis Slade; Dominion (Q-6): (2)** Technical issues - design complexity, difficulty meeting overshoot requirements. Shedding additional load equivalent to a non-coordinating generator would be extremely difficult to

design and coordinate. The design would have to account for the real-time status and output of the generator. Otherwise, this requirement could create more problems than it attempts to solve. For example, consider a load shed program that is designed assuming the need to shed load equivalent to rated capacity for a non-coordinating generator and a frequency event occurs when this generator is off-line. The program sees the frequency at the trigger level and sheds the load equivalent to the non-coordinating generator. However, since that generator wasn't actually online, there is no additional loss of generation, but the MW load equivalent of the generator (that is not designed into the UFLS scheme) is lost anyway. If the UFLS program then implements the next level of designed reduction of load, this may result in a subsequent rebound in frequency. This may very well result in overshoot that is more than designed for, resulting in generator trip from over-frequency. Obviously, the more non-coordinating generators there are, the more difficult the task of coordination with UFLS schemes becomes and the more widespread the effects on customers becomes. From a technical perspective, this requirement is impractical to implement and may result in unintended consequences.

Response: The issue of shedding too much load when the generator is off-line is the same if the DP/TO were required to compensate for the generator. The performance requirements for overshoot apply to studying the scheme, not to actual events.

- **Jose Medina, NextEra Energy Resources, LLC (Q-6):** NextEra does not agree with R6 as written. More specifically, the following phrase is problematic: "...the Generator Owner shall arrange for load shedding to be installed in addition to that required by the UFLS scheme." It is unclear how the generator is to arrange for this load shedding. What if the transmission owner or distribution provider refuses to shed load for a generator owner? What if they want compensation to shed load or even just to maintain the ability to shed this load if required? Generators do not have load to shed and should not be involved in shedding load. If a generator has equipment limitations that prevent remaining online during an under frequency event, then the TO or DP should be informed of these limitations. Generators should be required to have no tripping for under frequency inside the region described in the standard unless the generator can demonstrate that tripping must occur to prevent equipment damage.

Response: R6 was written for those generators who cannot reasonably meet this requirement to provide an alternative method to do their fair share in providing frequency support. Without R6 there would be no practical way to prevent Generator Owners from simply "opting out" of their obligation to provide frequency support. The commenter's suggestion that the standard contain a provision to not meet the requirement if "the generator can demonstrate that tripping must occur to prevent equipment damage" will create a standard that is difficult to measure and enforce and would reduce the motivation of the Generator Owner to meet the frequency response obligation via the preferred method.

- **Kirit Shah, Ameren (Q-3):** PRC-024 should be used for generator performance, rather than including these 3.1.2 limits here.

Response: While the SDT understands your concern, this requirement was added to the SERC UFLS standard to make it consistent with the latest draft of the NERC standard.

Implementation issues:

- **Jalal Babik, Lou Roeder, Jack Kerr, Kirit Doshi, Louis Slade; Dominion (Q-1):** Since the generation/load mismatch is being changed from the previous 10/20/30% to 15/20/25%, this will require a fresh UFLS study to verify adequacy of the UFLS scheme. In turn, it may require change in settings. Therefore, 12 months to comply with R1/R2/R3 is not sufficient. A 24-month study period is suggested as a minimum.

Response: The SDT is of the opinion that study procedures are not going to change significantly and all the required studies and changes to the relay settings can be satisfactorily accomplished in a 12-month period. While this will not necessarily require changes in relay settings, an additional 18 months is provided in the Implementation plan to make any required changes.

- **Mark Kuras, PJM (Q-5):** 5.1.2 should not limit the maximum UFLS allowed. There are many reasons to have more UFLS like accounting for a generator trip.

Response: The SDT disagrees. A limit on how much the amount of UFLS can exceed the scheme is needed to prevent possible frequency overshoot due to shedding too much load.

Islands issues:

- **Mark Kuras, PJM (Q-):** First bullet under 4.1 should say "new areas that may form islands are identified".

Response: The SDT does not agree with your proposed change. Your phrase "new areas" can lead the reader into interpreting it as meaning only new facilities. This is not the intent of the requirement. The SDT feels that the existing words are clear.

Minimum requirements issues:

- **Mark Kuras, PJM (Q-9):** : In R2.1, it will not be possible to shed 30% of the Peak Demand at all times because of variations in the load shape of each bus. Recommend adding "(measured at the Peak)" before "physically located".

Response: Requirement R2 part 2.1 places requirements only on the design of the UFLS scheme and as such does not address actual loads at the time of an event. Implementation of the scheme is address by R5.

TO coordination with DP/LSE issues:

- **None this posting**

Use of forecast versus historical actual load issues:

- **Kirit Shah, Ameren (Q-):** Ameren does recommend looking to the next (forecast), rather than past (measured), peak load for establishing UFLS amounts.

Response: R5 provides a way for measuring how well the scheme is implemented. Basing this measurement on the past peak load is the most accurate way to accomplish this.

- **James Manning/Bob Beadle, NC Electric Membership Corporation (Q-9):** NCEMC is an entity that serves load in three different areas with one being an RTO, and as such will continue to work with three different Transmission Planners to comply with this SERC UFLS standard once it goes into effect. We are concerned that the TPs may have inconsistent interpretations of the requirements of this standard which may result in us having to adapt to these different interpretations of what it takes to comply with this standard. One example of such inconsistency is the use of actual loads versus forecasted loads in requirement R5. We would like the SDT to consider including language within the draft standard to prevent such situations from occurring, to promote uniformity in how the UFLS scheme is designed and implemented. What mechanisms are provided to the TO and LSE/DP when they find themselves in dispute with the design issued by the TPs that is not in keeping with the SERC UFLS standard requirements?

Response: The way R5 is currently written, the requirement to implement the percent of load shed based on actual or estimated peak demand is left to the participating TO or participating DP. The TP only sets the percent value of the load to be shed in each step. The SDT does not believe this will result in the situation where a participating TO or participating DP will have to vary their chosen implementation method (actual vs. estimated peak demand) according to which TP issues the program specifications.

Timing of Balloting Standard (new issue category):

- **Kirit Shah, Ameren (Q-2):** While it's good to be proactive, it's more efficient to wait for NERC UFLS Standard revision to pass before finalizing SERC UFLS standard. There are about 75 pages of comments from 46 responders posted on NERC PRC-006-1 Draft 2, so it's premature to base this on "expected revisions".

Response: In order to be consistent, the SERC SDT has been closely monitoring the discussions going on at the NERC level. One of the members in the SERC UFLS SDT is also a member of the NERC SDT and has been updating the team on the discussions taking place at the NERC level. If major changes take place in the NERC standard, the SERC SDT will evaluate the changes and incorporate them into the SERC regional standard.

- **Laura Lee, Duke Energy (Q-9):** It is premature to draft a regional standard based on a draft revision to a continent wide standard. Drafting of the regional standard should wait until the continent wide standard is complete - at this stage of drafting the continent-wide standard changes could easily be made, or the standard revisions could be voted down.

Response: The SDT does not believe that this effort is premature. The NERC continent-wide UFLS standard is in its final stages, and will be posted soon for a final comment period. In order to be consistent with the NERC standard, the SERC SDT has been closely monitoring the discussions going on at the NERC level. One of the members in the SERC UFLS SDT is also a member of the NERC SDT and has been updating the team on these discussions. If major changes take place in the NERC standard, the SERC SDT will evaluate the changes and incorporate them into the SERC regional standard. Other regions are in the process of finalizing their UFLS standards.

- **Mark Kuras, PJM (Q-10):** Basing this standard on a non-approved NERC standard is premature.

Response: The SDT does not believe that this effort is premature. The NERC continent-wide UFLS standard is in its final stages and will be posted soon for a final comment period. In order to be consistent with the NERC standard, the SERC SDT has been closely monitoring the discussions going on at the NERC level. One of the members in the SERC UFLS SDT is also a member of the NERC SDT and has been updating the team on these discussions. If major changes take place in the NERC standard, the SERC SDT will evaluate the changes and incorporate them into the SERC regional standard. Other regions are also in the process of finalizing their UFLS standards.

Study Requirements (new issue category):

- **Mark Kuras, PJM (Q-2):** Each Transmission Planner should not be responsible to perform analysis on the entire SERC Region or even their entire subregion. This is a great deal of duplication of effort as each TP duplicates the overall SERC study.

Response: It was envisioned that the PCs/TPs in the SERC Region would perform these studies jointly, as is the current practice. Each TP would be expected to participate in the joint study or perform their own. Requirement R1 deals with the development of criteria for selection of islands and not with the issue of who should be performing the analysis.

- **Mark Kuras, PJM (Q-3):** R3 - Non-compliance of one Transmission Planner can cause all other Transmission Planners to be non-compliant too. Delete requirements that require the TP to study more than their area.

Response: Requirement 3.2.1 provides an option to the individual Transmission Planner to demonstrate compliance.

- **Jalal Babik, Lou Roeder, Jack Kerr, Kirit Doshi, Louis Slade; Dominion (Q-4):** R4.1 requires to perform restudy within 12 months. This is not sufficient time for such a study. A 24-month study period is suggested as a minimum.

Response: The SDT does not agree with increasing the amount of time to perform the study. The SDT believes that the criteria outlined in R4.1 are serious enough to warrant performing a study as soon as possible, given potential negative impacts to the BES.

- **James Manning/Bob Beadle, NC Electric Membership Corporation (Q-4):** What is the basis for the 500 MW or greater loss of load criteria in requirement 4.1? Why not say 300 MW which is associated with EOP-004?

Response: The basis for the 500 MW or greater loss of load requirement in 4.1 for post-mortem event analysis is from the NERC Classification Scale for Event Analysis Category 2d. The SDT feels that this is a more appropriate basis.