



**SERC Standards Committee (SC)
Consideration of Comments
Underfrequency Load Shedding (UFLS)
Regional Reliability Standard (PRC-006-SERC-01)
Draft 3a**

October 15, 2009

This document contains comments submitted on Draft 3a of the SERC Underfrequency Load Shedding (UFLS) Standard, which was distributed for review by the SERC UFLS Standard Drafting Team on September 15, 2009 in accordance with the SERC Regional Standards Development Procedure. Comments were received from the following:

- Laura Lee, Duke Energy
- Greg Mason, Dynegy
- Phil Kleckley, South Carolina Electric and Gas Company
- Kirit Shah, Ameren
- Richard Chapman, Owensboro Municipal Utilities
- SERC Planning Standards Subcommittee (PSS)
- James Manning/Bob Beadle, NC Electric Membership Corporation
- Jalal Babik, Lou Roeder, Jack Kerr, Kirit Doshi, and Louis Slade; Dominion
- Bob Thomas and Kevin Wagner, Illinois Municipal Electric Agency
- Kevin Hopper, Associated Electric Cooperative, Inc.
- Jose Medina, NextEra Energy Resources, LLC
- Alan Beckham, Calpine Corporation
- Nathan Lovett, Georgia Transmission Corporation
- Mark Kuras, PJM

The following is a list of 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?



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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.

Section	Commenter	Comment	Response
Question 1		Yes: 11 No: 1 Yes/No: 0 N/A: 2	
	Jalal Babik, Lou Roeder, Jack Kerr, Kirit Doshi, Louis Slade; Dominion	No: 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.	The SDT is of the opinion that study procedures are not going to change significantly and all the required studies can be satisfactorily accomplished in a 12 month period. While this will not necessarily require changes in relay settings, and additional 18 months is provided in the Implementation plan to make any required changes.
Question 2		Yes: 7 No: 1 Yes/No: 1 N/A: 5	
	Laura Lee, Duke Energy	No: (See answer for question 9.)	See response to Question 9
	Kirit Shah, Ameren	N/A: 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	In order to be consistent, the SERC SDT has been closely monitoring the discussions going



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		<p>NERC PRC-006-1 Draft 2, so it's pre-mature to base this on "expected revisions".</p>	<p>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.</p>
	<p>Mark Kuras, PJM</p>	<p>Yes/No: Transmission Planners should not be assigned this responsibility. The NERC Functional Model (V4) designates UFLS design to Distribution Providers.</p> <p>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.</p>	<p>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.</p> <p>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.</p>



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Question 3		Yes: 7 No: 3 Yes/No: 0 N/A: 4	
	Laura Lee, Duke Energy	No: (See answer for question 9.)	See response to Question 9
	Greg Mason, Dynegy	No: The proposed Figure 2 should be modified to indicate desired operating tolerance between 58.5 Hz and 60 Hz by extending the curve to indicate at what frequency delayed operation will begin and the lowest frequency for continuous operation (i.e., similar to the right side of the curve in Attachment 1 of draft NERC Standard PRC-024-1).	The SDT agrees to use the curve from PRC-024.
	Phil Kleckley, South Carolina Electric and Gas Company	Yes: Figure 1 System Frequency Performance Curve does not appear to meet the NERC Draft Standard PRC-006-1 Requirement 6.2 for performance not to remain below 58.5 Hz for greater than ten seconds.	The SDT agrees that the curve does not meet the requirements listed in Draft 2 of the NERC standard. However, Figure 1 is consistent with the latest draft of the NERC standard.
	Kirit Shah, Ameren	N/A: See answer in question 2. I only see 25% in NERC PRC-006-1 Draft 2; and PRC-024 should be used for generator performance, rather than including these 3.1.2 limits here.	The NERC standards states that it is “up to 25%.” The SERC standard added requirement for 15% and 20% to clarify this requirement. 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.
	SERC Planning Standards Subcommittee	Yes: Figure 1 system frequency performance curve does not appear to meet the NERC draft standard PRC-006-01 requirement 6.2 for performance not to remain below 58.5 Hz for greater than 10 seconds.	The SDT agrees that the curve does not meet the requirements listed in Draft 2 of the NERC standard. However, Figure 1 is consistent with the latest draft of the NERC standard.



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	James Manning/Bob Beadle, NC Electric Membership Corporation	<p>Yes: Can you briefly explain the basis for the lower level imbalance as I don't know what the expected revisions in the draft NERC UFLS standard are at this point (not posted on the NERC website yet)? See later comment in Q#9 about this.</p> <p>Figure 1 system frequency performance curve does not appear to meet the NERC draft standard PRC-006-01 requirement 6.2 for performance not to remain below 58.5 Hz for greater than 10 seconds.</p>	<p>The NERC standards states that it is "up to 25%." The SERC standard added requirement for 15% and 20% to clarify this requirement.</p> <p>The SDT agrees that the curve does not meet the requirements listed in Draft 2 of the NERC standard. However, Figure 1 is consistent with the latest draft of the NERC standard.</p>										
	Mark Kuras, PJM	<p>No: 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.</p> <p>Figure 1 needs work. I read it that no (or every) frequency is acceptable for 30 seconds or longer.</p>	<p>Requirement 3.2.1 provides an option to the individual Transmission Planner to demonstrate compliance.</p> <p>Figure 1 has been changes to clarify acceptable frequencies for longer than 30 seconds.</p>										
Question 4		Yes: 6 No: 2 Yes/No: 1 N/A: 5											
	Laura Lee, Duke Energy	No: (See answer for question 9.)	See response to Question 9										
	Kirit Shah, Ameren	<p>N/A: See answer in question 2. We agree that Generator Frequency performance must coordinate with System Frequency performance. However, for the last decade Ameren has applied previous MAIN requirements for generators were:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Generator UF Setting (Hz)</td> <td style="width: 50%;">Minimum Time Delay (Sec)</td> </tr> <tr> <td>> 59.5 Hz</td> <td>Automatic tripping not permitted</td> </tr> <tr> <td>< 59.5 to > 59.2 Hz</td> <td>2700 seconds</td> </tr> <tr> <td>< 59.2 to > 58.5 Hz</td> <td>120 seconds</td> </tr> <tr> <td>< 58.5 to > 58.0 Hz</td> <td>15 seconds</td> </tr> </table>	Generator UF Setting (Hz)	Minimum Time Delay (Sec)	> 59.5 Hz	Automatic tripping not permitted	< 59.5 to > 59.2 Hz	2700 seconds	< 59.2 to > 58.5 Hz	120 seconds	< 58.5 to > 58.0 Hz	15 seconds	The Implementation Plan for this standard allows 30 months to become compliant with this requirement. The SDT feels that this is a sufficient amount of time.
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> 59.5 Hz	Automatic tripping not permitted												
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			meaning only new facilities. This is not the intent of the requirement. The SDT feels that the existing words are clear.
Question 5		Yes: 7 No: 5 Yes/No: 0 N/A: 2	
	Laura Lee, Duke Energy	No: (See answer for question 9.)	See response to Question 9
	Kirit Shah, Ameren	<p>No: See answer in question 2. Ameren does not specifically see these tight load shed tolerances in PRC-006-2 Draft 2. Perhaps the SDT has done some simulation to determine the tight tolerances.</p> <p>Ameren does recommend looking to the next (forecast), rather than past (measured), peak load for establishing UFLS amounts.</p> <p>Also, specifying peak demand of the Balancing Authority is problematic for those entities that participate in a large ISO, where the ISO serves as the Balancing Authority. For a large Balancing Authority, the Balancing Authority peak load could occur several days apart from a particular Transmission Planner's system peak. It is suggested that "applicable Balancing Authority" in R5 be replaced with "applicable Transmission Planner."</p>	<p>Because the UFLS load values are based previous year's actual or estimated peak demand and the relays can be adjusted prior to reporting, the SDT does not believe that these tolerances are too tight. In fact they were increased in response to comments received on draft 2.</p> <p>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.</p> <p>The SDT agrees and had deleted the reference to the Balancing authority in R5 and R7.</p>
	SERC Planning Standards	No: 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	The use of the term "Transmission Owner that has an



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	Subcommittee	<p>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.</p> <p>The SDT should consider adding language to clarify whether the load shedding reported is inclusive of losses or not (i.e. at interconnection delivery point or at generation) to promote uniformity between entities reporting this data. It is our understanding that some entities report including losses while some do not.</p> <p>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.</p>	<p>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.</p> <p>The SDT agrees and has modified R5 to include the words "including losses".</p> <p>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.</p>
	James Manning/Bob Beadle, NC Electric Membership Corporation	<p>No: 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 a formal agreement? 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 existing NERC</p>	<p>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</p>



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		<p>UFLS standard. Please explain the use of agreement between the parties involved.</p> <p>The SDT should consider adding language to clarify whether the load shedding reported is inclusive of losses or not (i.e. at interconnection delivery point or at generation) to promote uniformity between entities reporting this data. It is our understanding that some entities report including losses while some do not.</p> <p>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(s). The LSE, not the individual DPs we represent, will be working closely with the TPs and TOs 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.</p>	<p>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.</p> <p>The SDT agrees and has modified R5 to include the words "including losses".</p> <p>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.</p>
	Mark Kuras, PJM	<p>No: Transmission Owners should not be assigned this responsibility. The NERC Functional Model designates UFLS implementation to Distribution Providers. If a Transmission Owners 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</p>	<p>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.</p>



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		<p>Distribution Provider provides the switches and reclosers that could be used to shed load for emergency action.</p> <p>R5 should use forecasted peak demand not actual historical demand which can vary widely from year to year.</p> <p>5.1 - Is the "total load" here based on Forecast or history?</p> <p>5.1.2 should not limit the maximum UFLS allowed. There are many reasons to have more UFLS like accounting for a generator trip.</p>	<p>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.</p> <p>It is based on the previous year actual peak demand.</p> <p>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.</p>
Question 6		Yes: 4 No: 8 Yes/No: 0 N/A: 2	
	Laura Lee, Duke Energy	No: (See answer for question 9.)	See response to Q9
	Greg Mason, Dynegy	No: 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	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.



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		<p>program.</p> <p>Generator Owner's 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.</p> <p>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.</p>	<p>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."</p> <p>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.</p>
	Kirit Shah, Ameren	<p>No: See answer in question 2. R6 additional load shed is appropriate if the generator(s) that would trip are on-line when the real event occurs, but if they're not a considerable amount of load could be "overshed".</p>	<p>It is anticipated that most GO's will meet the requirement and not have to arrange for load tripping. However, either the GO or the DP/TO has to arrange for the additional load to be tripped to compensate for the generator's possibly tripping. While some overshoot may be experienced</p>



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		<p>In R7.2 GO should also report which Participating DP or TO they're connected to, unless this is to part of R8 entity coordination.</p> <p>Also, wording that should be added at the end of Requirement 7.1: as implemented in the field: should be modified to read: as implemented in the field at the time the report is filed:</p>	<p>for a particular dispatch and event, the scheme is designed to meet the performance requirements. For an actual event it is better to provide a little extra load shedding, than to provide too little which could result system or island collapse.</p> <p>The SDT agrees with this concept and has made the suggested change to 7.2.5.</p> <p>The SDT agrees and has made the suggested change.</p>
	SERC Planning Standards Subcommittee	<p>Yes: We are still not in full agreement with requirement R6 whereby a generator that does not coordinate must arrange for additional load shed, but will do what's needed to comply with generators we own. We are concerned with jointly-owned units and others that may not coordinate which may have an impact of load shed that may be forced on loads as a result of non-coordinating generators. Did the SDT consider how these non-coordinating generators would be dealt with should they refuse to comply or will SERC handle them?</p>	<p>After the standard goes into effect, non-compliance with the standard requirements will be addressed by SERC Compliance staff.</p>
	James Manning/Bob Beadle, NC Electric Membership Corporation	<p>No: We are still not in full agreement with requirement R6 whereby a generator that does not coordinate must arrange for additional load shed, but will do what's needed to comply with generators we own. We are concerned with jointly-owned units and others that may not coordinate which may have an impact on other LSE/DPs in the area as a result of non-coordinating generators. Did the SDT consider how these non-coordinating generators would be dealt with should they refuse to comply or will SERC handle them?</p>	<p>After the standard goes into effect, non-compliance with the standard requirements will be addressed by SERC Compliance staff.</p>



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		<p>Requirement R7.1.2 says that the opening time is measured from the time the frequency reaches the set point until when the breaker opens. While this is the true opening time, it causes some hardship because additional testing equipment and connections are required to measure the breaker opening time. We would prefer the measurement to be from the time the frequency reaches the set point until the trip command is issued and the trip time would then be assumed to be small.</p> <p>This seems to be consistent with R7.2.3. Please explain the difference if that is what the SDT intended.</p>	<p>This requirement does not necessarily force you to make measurements. The circuit breaker's rated interrupting time can be added to the time between the frequency reaching the setpoint and the time that the trip command is issued.</p> <p>The SDT agrees that this is inconsistent and has changed 7.2.3 to read "Total time delay (from initiation to breaker opening) associated with each set point (sec). This includes the time from when frequency reaches the set point and ends when the breaker opens."</p>
	<p>Jalal Babik, Lou Roeder, Jack Kerr, Kirit Doshi, Louis Slade; Dominion</p>	<p>No: 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:</p> <p>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;</p> <p>(1) Implementation issues - load shed service does not currently exist, may require modification to existing tariffs, raises jurisdictional issues</p>	<p>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.</p> <p>The SDT does not believe that shedding load becomes an OATT issue.</p>



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		<p>(state vs. federal) and Code/Standards of Conduct concerns.</p> <p>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.</p> <p>(2) Technical issues - design complexity, difficulty meeting overshoot requirements.</p> <p>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 on line, 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</p>	<p>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.</p> <p>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.</p>



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		<p>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.</p> <p>3) Applicability issue - Applicability of this requirement to generator owner is not consistent with the SAR upon which the proposed standard is predicated.</p> <p>We could support a requirement that (1) sets target levels for underfrequency trip of all generators (whether manual or automatic) and (2) allows for deviation where generator owner has a documented technical reason for such variance. Where such documentation exists, the respective Distribution Provider or Transmission Owner should be required to factor this into the development of their automatic UFLS program.</p>	<p>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.</p> <p>The SDT believes the burden of addressing problems caused by a non-coordinating generator should be on the generator owner.</p>
	<p>Kevin Hopper, Associated Electric Cooperative, Inc.</p>	<p>No: In 8.1, we are required to perform a joint review with surrounding Planning Coordinators/Transmission Planners. It seems like if we did everything to make the joint review happen on our end, and our neighbors did nothing, our company's compliance would be determined by another company's actions.</p>	<p>Requirement R8 is written to foster and encourage the inter-regional coordination of UFLS schemes. For this to be truly effective, co-operation among neighboring utilities and regions is necessary. A corresponding requirement is currently included in the NERC draft UFLS standard. In the rare case that cooperation is not forthcoming</p>



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			from adjacent entities, documentation of a good faith effort to meet this requirement is recommended.
	Jose Medina, NextEra Energy Resources, LLC	<p>No: R6: 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 refuse 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 on line 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.</p> <p>R7: NextEra questions whether providing UFLS settings annually is of value. Once established, UFLS settings do not tend to change over time</p>	<p>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.</p> <p>The SDT agrees with the commenter that UFLS settings do not tend to change by a large amount from year to year.</p>



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		<p>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.</p>	<p>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.</p>
	<p>Alan Beckham, Calpine Corporation</p>	<p>No: Since the proposed NERC Standard PRC-024 will have requirements for off-nominal voltage and frequency operation of generators, SERC's proposed PRC-006 should only have requirements for the load shedding blocks and refer the generators to PRC-024. Obviously this standard needs to coordinate with what is contained in PRC-024, but the requirements should only be in a single standard. PRC-024 provides a more concise representation of the requirements for generators than does the proposed version of SERC PRC-006.</p> <p>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</p>	<p>The SDT agrees that standard PRC-006-SERC-01 should coordinate with PRC-024. For the SERC standard to be complete in meeting the objective of ensuring adequate frequency response within the SERC Region, the requirements from Figure 2 (generator performance) must be included in this standard.</p> <p>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</p>



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		<p>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 included generators in operation, construction or generators that have an executed purchase agreement at the time the standard is approved.</p> <p>Since the curves in both Fig. 1 and Fig. 2 stop at 30 sec., it's unclear what the continuous operating range is supposed to be.</p> <p>While the curves of Fig. 1 and Fig. 2 are helpful in visualizing performance requirements, they should be accompanied with mathematical expressions which clearly define the different regions. When it comes to compliance, it shouldn't be up to interpreting a point on a curve and whether the curve itself is within the region of required operation or not.</p>	<p>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.</p> <p>The SDT agrees and has modified the figures accordingly.</p> <p>The SDT agrees with the concern and has modified the curves to make it clearer, which should help avoid interpretation errors.</p>



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Question 7		Yes: 7 No: 2 Yes/No: 0 N/A: 5	
	Jalal Babik, Lou Roeder, Jack Kerr, Kirit Doshi, Louis Slade; Dominion	No: Don't agree with M6 because we don't agree with R6.	See response to Question 6.
	Kevin Hopper, Associated Electric Cooperative, Inc.	No: In M8.1, the concerns are the same as in question 6.	See response to Question 6.
Question 8		Yes: 5 No: 6 Yes/No: 0 N/A: 3	
	Laura Lee, Duke Energy	No: 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. The Reliability Standards Development Plan states that “The SDT shall determine which requirements should be continent-wide requirements and which requirements should be included in regional standards” – it is not clear that this work has been completed. The draft of PRC-006-01 that is currently posted does not require a regional standard – it requires a program (R2), criteria (R3), a procedure (R4). If the lack of a regional standard is considered a compliance issue because of PRC-006-0, then the regional standard should be drafted to comply with that (approved) continent wide standard, similar to the current draft of PRC-006-RFC-01.	See response to Question 9.
	Greg Mason, Dynegy	No: VSLs for R7 should only range from Low to Moderate because R7 pertains to data collection.	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.



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	Kirit Shah, Ameren	No: R5.1: Shift content of moderate and high columns leftward towards low and moderate. Split the content of the severe column at the 'OR' and place one item in the high column.	The SDT agrees with the concerns expressed, and has made changes to the VSLs for R5.1.
	SERC Planning Standards Subcommittee	No: For the VSL for 5.1, move the contents of the Moderate and High VSL to the Lower and Moderate VSL respectively. Copy the Severe VSL to High and change "or" to "and" in the Severe VSL.	The SDT agrees with the concerns expressed, and has made changes to the VSLs for R5.1.
	James Manning/Bob Beadle, NC Electric Membership Corporation	No: For the VSL for 5.1, move the contents of the Moderate and High VSL to the Lower and Moderate VSL respectively. Copy the Severe VSL to High and change "or" to "and" in the Severe VSL.	The SDT agrees with the concerns expressed, and has made changes to the VSLs for R5.1.
	Jalal Babik, Lou Roeder, Jack Kerr, Kirit Doshi, Louis Slade; Dominion	No: Disagree with those associated with R6.	See response to Question 6.
Question 9		Yes: 9 No: 3 Yes/No: 0 N/A: 2	
	Laura Lee, Duke Energy	Yes: 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.	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



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		<p>The Reliability Standards Development Plan states that "The SDT shall determine which requirements should be continent-wide requirements and which requirements should be included in regional standards" - it is not clear that this work has been completed. The draft of PRC-006-01 that is currently posted does not require a regional standard - it requires a program (R2), criteria (R3), a procedure (R4). If the lack of a regional standard is considered a compliance issue because of PRC-006-0, then the regional standard should be drafted to comply with that (approved) continent wide standard, similar to the current draft of PRC-006-RFC-01.</p>	<p>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.</p> <p>The approach that the SERC SDT is taking is that PRC-006-SERC-01 will stand independent of the NERC standard. The SERC standard contains additional requirements more specific to the needs of the SERC region.</p>
	<p>Phil Kleckley, South Carolina Electric and Gas Company</p>	<p>Yes: Questions 2-6 ask if we agree with expected revisions in the draft NERC UFLS standard. It is difficult to comment on expected revisions that do not yet appear in the draft standard.</p>	<p>The SDT understands your concern, but felt that Draft 3a needed to be designed to be consistent with the latest draft of the NERC standard which was provided by a member of the NERC drafting team.</p>
	<p>Kirit Shah, Ameren</p>	<p>Yes: Comments on revisions expected to be made at the NERC level are difficult to provide at this point because such revisions haven't been made available.</p>	<p>The SDT understands your concern, but felt that Draft 3a needed to be designed to be consistent with the latest draft of the NERC standard which was</p>



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			provided by a member of the NERC drafting team.
	SERC Planning Standards Subcommittee	Yes: Questions 2 through 6 asked if we agreed with revisions to the SERC standard to be consistent with expected revisions in the draft NERC UFLS standards. It is difficult to comment on expected revisions that do not yet appear in the draft NERC standard.	The SDT understands your concern, but felt that Draft 3a needed to be designed to be consistent with the latest draft of the NERC standard which was provided by a member of the NERC drafting team.
	James Manning/Bob Beadle, NC Electric Membership Corporation	<p>Yes: Questions 2 through 6 asked if we agreed with revisions to the SERC standard to be consistent with expected revisions in the draft NERC UFLS standards. It is difficult to comment on expected revisions that do not yet appear in the draft NERC standard.</p> <p>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?</p>	<p>The SDT understands your concern, but felt that Draft 3a needed to be designed to be consistent with the latest draft of the NERC standard which was provided by a member of the NERC drafting team.</p> <p>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.</p>



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	Jose Medina, NextEra Energy Resources, LLC	Yes: NextEra is unclear as to why the UFLS diagrams provided in figure 2 describe not only UFLS thresholds but also an Over-frequency curve. It is unclear how this curve is to be used by Generators in meeting its responsibilities to this standard.	The overfrequency curve in figure 2 only applies to requirement 4 part 4.2. The SDT agrees that the wording of requirement R6 does not state clearly enough that it applies to underfrequency performance only. Requirement R6 has been modified to clarify the requirement for GOs.
	Nathan Lovett, Georgia Transmission Corporation	Yes: <ul style="list-style-type: none"> • R2 needs to state that either Actual, Forecast, Planning or Previous Year Load can be used to determine Peak Demand • R3.1.2.1 allows for generating units less than 20MVA to get around meeting performance criteria. This can result in problems and inaccurate assumptions when performing the study. • Most Transmission Planning studies are done by coordinating within the various entities in SERC. Shouldn't the SERC DSG be involved in the studies to determine the effectiveness of the schemes and how they coordinate with regions external to SERC as opposed to individual TPs? 	<p>The percent load shedding included in the scheme is independent of actual versus forecast peak for design purposes. The TP can use either actual or forecast loads in designing the scheme. However, this does become important during implementation of the scheme as specified in R5.</p> <p>Requirement R3 part 3.1.2.1 does not apply to generators. It applies to a bus V/Hz modeling requirement by the TP during the design of the UFLS scheme.</p> <p>The SERC DSG has traditionally conducted these studies in the past and studies conducted by the SERC DSG in the future can serve this same purpose.</p>



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	Mark Kuras, PJM	Yes: 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".	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.
Question 10		(A): 7 (B): 2 (C): 5 N/A: 0	
	Laura Lee, Duke Energy	C: The major concern is drafting a regional standard in support of an unapproved continent wide standard.	Thank you for your comments. Please see our response to your comments on Question 9.
	Greg Mason, Dynegy	C: (See comments on R6.)	We have attempted to alleviate your concerns by incorporating suggested changes in the standard or providing reasons for not changing the standard. Thank you for the time you have spent reviewing the draft standard and providing comments.
	Kirit Shah, Ameren	C: This response is based on our concerns as expressed in Questions 5 and 9.	We have attempted to alleviate your concerns by incorporating suggested changes in the standard or providing reasons for not changing the standard. Thank you for the time you have spent reviewing the draft standard and providing comments.
	Jalal Babik, Lou Roeder, Jack	C: We can't support a standard that is predicated upon an entity acquiring a service (load shed) that is not offered by a Transmission	We have attempted to alleviate your concerns by incorporating



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	Kerr, Kirit Doshi, Louis Slade; Dominion	Owner or Distribution Provider when our informal poll has shown they have no intention of offering such service and that is opposed by at least one such owner (our own) on the basis of technical concerns.	suggested changes in the standard or providing reasons for not changing the standard. Thank you for the time you have spent reviewing the draft standard and providing comments.
	Bob Thomas and Kevin Wagner, Illinois Municipal Electric Agency	A: IMEA appreciates the efforts of the SDT and its consideration of our comments on earlier drafts, and the workable approach for this SERC-specific UFLS reliability standard (which will hopefully set a precedent for other regions).	Thank you for your comments.
	Jose Medina, NextEra Energy Resources, LLC	C: If NextEra's reservations with R6 and R7 could be resolved, we could support this standard.	We have attempted to alleviate your concerns by incorporating suggested changes in the standard or providing reasons for not changing the standard. Thank you for the time you have spent reviewing the draft standard and providing comments.
	Alan Beckham, Calpine Corporation	B: We recognize the need for a Standard however we believe the generator specific information should reside solely in PRC-024.	We have attempted to alleviate your concerns by incorporating suggested changes in the standard or providing reasons for not changing the standard. Thank you for the time you have spent reviewing the draft standard and providing comments.
	Mark Kuras, PJM	B: Basing this standard on a non-approved NERC standard is premature.	The SDT does not believe that this effort is premature. The NERC continent-wide UFLS



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			<p>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.</p>