NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Consideration of Comments on Initial Ballot — Project 2007-01 Underfrequency Load Shedding
Date of Initial Ballot: July 7-17, 2010

Summary Consideration:
During the third posting of PRC-006-1 and EOP-003-2 the standard drafting team made several conforming changes as a result of the industry comments received.

The fourth version of the proposed standard addresses the coordination issue many commenters expressed. Many commenters suggested that the Reliability Assurer be assigned responsibility for coordinating UFLS activities and for reaching concurrence. In the third version of the standard Requirement R5 and R13 required concurrence between Planning Coordinators if an island encompassed more than on Planning Coordinator area. Instead of assigning responsibility to the Reliability Assurer the standard drafting team revised Requirements R5 and R13 to define a set of actions that are measureable that will demonstrate that Planning Coordinators worked together should an island span more than one Planning Coordinator area. The standard drafting team confirms that the Planning Coordinator is the appropriate entity to design UFLS and conduct the other UFLS related activities based on the definition of the Planning Coordinator in the Functional Model Version 5.

Commenters expressed confusion over having Transmission Owners as part of UFLS Entities but separated out as Transmission Owners in Requirement R10 and suggested combining R9 and R10. The team reviewed the rationale for this structure. Requirement R9 focuses on automatic tripping of load and may be performed by either the Distribution Provider or the Transmission Operator; Requirement R10 focuses on switching of devices to control over-voltage as a result of under frequency load shedding. Therefore, the team decided not to merge the two requirements.

Commenters expressed that the wording in Requirement R10 “switching of elements” is confusing. The team modified Requirement R10 to clarify that it means: “switching of capacitor banks, Transmission Lines, and reactors” in order to control over voltage as a result of under frequency load shedding.

Many commenters indicated that Generator Owners should be included in the applicability of the standard. Some suggested including a data requirement in PRC-006-1 that requires the Generator Owners to submit the necessary data to accomplish Requirement R4; however, the team felt that because such a data requirement already exists in PRC-024 and because the team has clarified in the effective date of the standard that the sub-parts related to generators will not be effective until PRC-024 is approved and effective that adding such a data requirement to PRC-006 would be redundant and possibly cause double jeopardy concerns.

The standard drafting team received several comments on EOP-003 that expressed concern that the removal of under-frequency load shedding in the standard was not clear enough. The standard drafting team made modifications to the EOP-003 requirements that clarify that the load shedding referred to in the requirements exclude automatic under-frequency load shedding.

If you feel that the drafting team overlooked your comments, please let us know immediately. Our goal is to give every comment serious consideration in this process. If you feel there has been an error or omission, you can contact the Vice President and Director of Standards, Herbert Schrayshuen, at 609-452-8060 or at herb.schrayshuen@nerc.net. In addition, there is a NERC Reliability Standards Appeals Process.[1]

[1] The appeals process is in the Reliability Standards Development Procedure: http://www.nerc.com/files/RSDP_V6_1_12Mar07.pdf.

Voter	Entity	Segment	Vote	Comment
Kirit S. Shah	Ameren Services	1	Negative	(1) PRC-006, R1 should be modified such that PC is required to coordinate development of the islanding criteria in consultation with TO and TP. Further, presently the RE is involved in performing or coordinating the islanding/UFLS studies. We believe that RE should continue to be involved. (2) PRC-006, R2.3 No basis provided for criteria included in the second part of R2.3; that is, each RE footprint that resides in the PC footprint is to be identified as an island. (3) EOP-003-1, R2, the last phrase should be modified from "...load shedding scheme is required." to "...load shedding scheme is necessary to minimize the risk of uncontrolled failure of the interconnected system to match the "Purpose" of the standard.
Response: Many commenters suggested that the Reliability Assurer be assigned responsibility for coordinating UFLS activities and for reaching concurrence. In the third version of the standard Requirement R5 and R13 required concurrence between Planning Coordinators if an island encompassed more than on Planning Coordinator area. Instead of assigning responsibility to the Reliability Assurer the standard drafting team revised Requirements R5 and R13 to define a set of actions that are measureable that will demonstrate that Planning Coordinators worked together should an island span more than one Planning Coordinator area. The standard drafting team confirms that the Planning Coordinator is the appropriate entity to design UFLS and conduct the other UFLS related activities based on the definition of the Planning Coordinator in the Functional Model version 5.				
George T. Ballew	Tennessee Valley Authority	5	Negative	"Comments associated with the negative vote are contained in the Project 2007-01 comment form submitted by TVA."
Response: Please see our response to your comments.				
Henry Delk, Jr.	SCE&G	1	Negative	1) SCE&G proposes an effective date of 24 months after regulatory approval. We believe the currently proposed effective date of 12 months after regulatory approval would not allow enough time to ensure compliance due to the requirements to establish criteria to identify islands, coordinate results with other Planning Coordinators, and reach concurrence with all other affected Planning Coordinators on UFLS design assessment results before design assessment completion. A number of these requirements cannot be met until a prior requirement is completed and each of these requirements requires coordination with other utilities which will increase the amount of time necessary to obtain compliance. As a result, SCE&G believes an effective date of 24 months after regulatory approval would be much more practical and desirable than the currently proposed 12 month effective date. **Response:** The standard drafting team received feedback that many of the existing UFLS programs meet the performance characteristics in the proposed standard. Once this standard is approved the entities with existing programs would need a year to validate their program and validate the schedule for implementation with the UFLS entities. 2) The graphical representation of the frequency-time curves alone allows plenty of margin for mis-interpretation of the curves data points. A "break-down" of the plotted curves should be clearly displayed (in conjunction with the graphical curve representation) in a
Matt H Bullard	South Carolina Electric & Gas Co.	6	Negative	

Voter	Entity	Segment	Vote	Comment
				table immediately below each frequency-time curve to further clarify the under- and over-frequency performance characteristic curves data points. **Response:** The SDT believes that there is confusion concerning the application of the curves. The goal of the UFLS is to control frequency during a UFLS event such that generation does not trip. Project 2007-09 Generator Verification for draft Standard PRC-024 is developing the curves to establish the over- and under-frequency protection for the generation, so, the UFLS SDT is trying to stay within those curves by some margin, e.g., between the two curves of Attachment 1 and 2. The SDT recognizes that some generators may not meet those curves and wants the PC to specifically model the trip settings of those generators. We understand that V/Hz is not a standard output, but, it should not be a large effort to monitor voltage and frequency, divide the two, and integrate over each time step. The SDT received many comments on prior versions of this standard to make sure PRC-006 was coordinated with PRC-024 as the two were being drafted. We are taking the direction of the majority of commenters.
Horace Stephen Williamson	Southern Company Services, Inc.	1	Negative	1. R5 and R13 require that both or all the PC's reach concurrence on the assessment of the UFLS performance in an island. One entity might have larger margin requirements or a different methodology compared to another entity. These differences might not be reconcilable. A standard should not require that one PC has to agree with another PC. **Response:** The standard drafting team revised Requirements R5 and R13 to define a set of actions that are measureable that will demonstrate that Planning Coordinators worked together should an island span more than one Planning Coordinator area. The standard drafting team confirms that the Planning Coordinator is the appropriate entity to design UFLS and conduct the other UFLS related activities based on the definition of the Planning Coordinator in the Functional Model version 5. 2. R11 needs to have a MW size threshold for requiring the assessment of an UFLS event. As written, this requirement could require an assessment of an event where a breaker opened on a radial 115 kV line which had an 8 MW generator and 15 MW of load on the feeder. Such a small event has no consequence to the reliability of the BES. A MW threshold of 500 MW would be appropriate. 3. Miscellaneous improvements required to wording of R5, M5, and several VSL's. **Response:** PRC-009, a FERC approved standard, does not have an event threshold, and PRC-006 is absorbing PRC-009.
Richard J. Mandes	Alabama Power Company	3	Negative	
Anthony L Wilson	Georgia Power Company	3	Negative	
Gwen S Frazier	Gulf Power Company	3	Negative	
Don Horsley	Mississippi Power	3	Negative	
Response:				
Bruce Merrill	Lincoln Electric System	3	Negative	Although Draft 3 contains many significant improvements over previous drafts, LES believes the standard can be further refined to incorporate important issues that are not adequately addressed at this time. Please see the MRO NSRS group comments for LES'

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Dennis Florom	Lincoln Electric System	5	Negative	specific concerns. **Response:** The SDT recognizes that the Functional Model Version 5 and the Statement of Compliance Registry cause confusion regarding the involvement of the LSE in UFLS programs but the SDT refers to the section covering the Roles in Load Curtailment in Version 5 of the Functional Model Technical Document; "For non-voluntary curtailment, such as automatic underfrequency and undervoltage load shedding and manual load shedding, the Load-Serving Entity identifies which critical customer loads should be excluded from curtailment for public health, safety and/or security reasons.
Eric Ruskamp	Lincoln Electric System	6	Negative	
Linda R. Jacobson	City of Farmington	3	Negative	Another concern is the proposed standard attempts to establish continent wide frequency-time curves and eliminate discrete set points. This approach fails to recognize the unique characteristics of the four individual interconnections. Frequency-time curves do not allow for specific and defined measurements and will leave individual entities defaulting to the lowest common denominator. If frequency-time curves are intended to define the boundaries, the determination of discrete set points would fall into the hands of the PCs leading to disagreements among entities. In addition, to determine the frequency-time curves through stability and dynamic modeling, one must establish discrete set points. Frequency-time curves are reverse engineering and require justification and correlation to the reliability of the interconnections - no such justification has been provided.
Response: The SDT believes that there is confusion concerning the application of the curves. The goal of the UFLS is to control frequency during a UFLS event such that generation does not trip. Project 2007-09 Generator Verification for draft Standard PRC-024 is developing the curves to establish the over- and under-frequency protection for the generation, so, the UFLS SDT is trying to stay within those curves by some margin, e.g., between the two curves of Attachment 1 and 2. The SDT recognizes that some generators may not meet those curves and wants the PC to specifically model the trip settings of those generators. We understand that V/Hz is not a standard output, but, it should not be a large effort to monitor voltage and frequency, divide the two, and integrate over each time step. The SDT received many comments on prior versions of this standard to make sure PRC-006 was coordinated with PRC-024 as the two were being drafted. We are taking the direction of the majority of commenters.				
Gregory Campoli	New York Independent System Operator	2	Negative	Applicability of the standard, as proposed, excludes inclusion of generators; however, R4 requires PCs to model generator specific information. This represents a missing link that needs to be addressed before the standard can be approved. This standard seems to be contrary to FERC's stated concern (Oct. 2009 Washington DC meeting) to develop a standard that can support the program it was designed to enforce.....the applicability as stated in the standard and by NERC registry criteria restricts and excludes the need for GO's that may in aggregate be necessary for a reliable UFLS program, to adhere to the standard. The standard also is potentially in conflict with the work being done on the Generator Verification Standard, which proposes to have Generator Performance During Frequency and Voltage Excursions contained in PRC-024. Sufficient coordination on NERC Standards development needs to occur on a going forward basis.
Response: The suggestion to include the Generator Owners in the proposed standard is problematic because such a data requirement already exists in PRC-024 and because the team has clarified in the effective date of the standard that the sub-parts related to generators will not be effective until PRC-024				

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is approved and effective that adding such a data requirement to PRC-006 would be redundant and possibly cause double jeopardy concerns.				
Jason Shaver	American Transmission Company, LLC	1	Negative	ATC is voting negative for the following reasons. These comments were submitted in our NERC comment form. M5 - As noted in the comments below for R5, replace the words "reached concurrence with" with "provided a UFLS design assessment report to". Fulfillment of a compliance measure that involves reaching concurrence with another entity is dependent on the other entity and can be outside of the control of the Planning Coordinator. In addition, replace the words "other affected Planning Coordinators" with "other Planning Coordinators that have design assessment responsibilities for islands covered in the design assessment report. The qualification of "other affected Planning Coordinators" is too vague and could be interpreted and categorized differently by various entities and auditors. M7 - As noted in the comments below for R7, replace "within their Interconnection", with "that have design assessment responsibilities within the islands covered by the UFLS database". Planning Coordinators that are within the same Interconnection, but are not within any islands covered by another Planning Coordinators UFLS database, would not need to receive the UFLS information. M10 - Replace "automatic switching of Facilities" with "automatic switching of Elements" to be consistent with the associated Requirement R10. We propose that the scope of the SAR be revised to call for removing the automatic UFLS requirements from EOP-003-1 and referring them to PRC-006-1 standard, and for also removing the automatic UVLS requirements from EOP-003-1 and referring them to a new PRC standard. In line with the comments for Question 6: R2 - remove this requirement because it refers to automatic load shedding plans, let this be covered by PRC-006-1 and new PRC standard. R3 - add the qualification "coordinate manual load shedding plans". R4 - remove this requirement because it refers to automatic load shedding plans, let this be covered by PRC-006-1 and a new PRC standard. R5 - add the qualification "implement manual load shedding plans". R7 - remove this requirement because it refers to automatic load shedding plans, let this be covered by PRC-006-1 and a new PRC standard. 1. In R3, the term, "imbalance", should be described using the standard industry nomenclature of imbalance = (load-generation)/generation. 2. In R4, we interpret that the Equivalent Inertia Analysis is a valid dynamic simulation methodology for certain aspects of UFLS assessments. So, we expect that this type of dynamic analysis would be accepted toward compliance with the "through dynamic simulation" portion of this requirement Attachement 1 for R4.1, R4.2, R4.3 3. The title for Attachment 1 should clearly qualify that this curve applies for a 25% or less island imbalance. The curves that should be used for UFLS programs associated with imbalance levels greater than 25% (e.g. 30%, 40%, 50%) would be different from the 25% curve. 4. The Under Frequency Performance Characteristic line in Attachment 1 should be extended to 59.5 Hz (at 500 sec). The reason for this change is that the worst case response between 58.7 Hz and 59.5 Hz may occur for imbalance conditions significantly less than 25% where the governor response prevents the load shedding blocks from

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				picking up and where response recovery times is a function of governor response and system inertia (30 seconds to 500 seconds). This removes the knee of the curve at 30 seconds and extends the curve up to 500 seconds. This would change the 30 second at 58.9 Hz cut off point to 500 seconds. 5. Add a note to Attachment 1 that states, "Larger size UFLS programs (e.g., 40%) may require less restrictive (lower and/or longer time delays) underfrequeny limits due to island generation and protection characteristics." UFLS programs shedding more than 25% must increase generation protection delay times and/or change set points to achieve coordination with load shedding. For example, Manitoba Hydro and Saskatchewan need to shed more than 30% of the area load to achieve reasonable frequency recovery in their islands. In these areas, the shedding of a higher percentage of load may allow the frequency to drop below 58.2 Hz for longer than 4 seconds, but the subsequent impacts on the hydro generator in these islands are acceptable. Attachment 2 for R4.4, R4.5, R4.6 6. The title for Attachment 2 should clearly qualify that this curve applies for a 25% or less island imbalance. The curves that should be used for UFLS programs associated with imbalance levels greater than 25% (e.g. 30%, 40%, 50%) would be different from the 25% curve. Generator Underfrequency and Overfrequency Attachments 7. The Generation Owner off-nominal frequency coordination requirements and coordination curves should be included in the PRC-006 standard. The generation curves should be applicable for load shedding levels beyond the 25% (e.g. 30%, 40%, 50%). If curves beyond 25% are not include, then the titles of the curves should qualify that they apply for 25% imbalance and include an note regarding coordination with UFLS programs that shed higher than 25% of the island load. The line should extend to 57 Hz (at .3 sec) to 59.5Hz (at 1800 sec). The minimum frequency of 57.0 Hz was chosen because most conventional generation can briefly operate down to 57.0 Hz and large load shedding programs may need to make use of that capability to achieve coordination with these UFLS programs. Volts/Hertz Performance Characteristic 8. The Volts/Hz requirement should be removed. This performance characteristic cannot presently be properly simulated. The voltage regulator V/Hz controls are not presently included in generator exciter/voltage regulator models of the present power system modeling programs that are used for dynamic power system simulation. In addition, the Volts/hertz requirement is not need in this standard. Voltage regulators automatically reduce voltage according to volts per hertz when in the automatic mode. Industry recommendations/standards (IEEE C37.102 or IEEE C37.106, ANSI C50.13-1989, IEEE C57.12.00-2000) already exist that adequately address the volts/Hz issue. Replace the words “reach concurrence with” with “provide UFLS design assessment results to”. Fulfillment of a compliance measure that involves reaching concurrence with another entity is dependent on the other entity and can be outside of the control of the Planning Coordinator. In addition, replace the words “other affected Planning Coordinators” with “other Planning Coordinators that have design assessment responsibilities for islands covered in the design assessment report. The qualification of “other affected Planning Coordinators” is too vague and could be interpreted and categorized differently by various

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				entities and auditors. Consideration should be given to replacing “Transmission Owner” with “UFLS Entity” because the automatic switching of distribution Elements (e.g. capacitor banks) may be more effective and practical UFLS design than restricting the scope of the requirement to just transmission Elements. 1. For R11, replace “Each Planning Coordinator, in whose footprint . . . to evaluate” with “When a disturbance event occurs in a Planning Coordinator’s footprint that involves automatic UFLS program operation or frequency excursions should have activated UFLS program operation, and a final disturbance report is required per EOP-004, each Planning Coordinator shall evaluate within one year of the disturbance event:”. 2. Either part of or after R11, there should be a requirement that “Each Planning Coordinator shall provide a preliminary event assessment report to the other Planning Coordinators who must conduct an assessment of the event for review at least 90 days before finalizing the event assessment report. 3. For R13, replace “in whose footprint . . .on the event assessment result” with “that conducts an UFLS design assessment (per R12) for islands where other Planning Coordinators have design assessm
Response: Please see our responses to your comments in the consideration of comments report.				
Scott Kinney	Avista Corp.	1	Negative	Avista has the following comments o The proposed standard fails to address UFLS relays which are currently part of the program which are owned by the customer. This is critical to have a successful program. In addition the UFLS- DT believes to assure areas are covered the LSE needs to be included in the Applicability section. **Response:** The SDT recognizes that the Functional Model Version 5 and the Statement of Compliance Registry cause confusion regarding the involvement of the LSE in UFLS programs but the SDT refers to the section covering the Roles in Load Curtailment in Version 5 of the Functional Model Technical Document; “For non-voluntary curtailment, such as automatic underfrequency and undervoltage load shedding and manual load shedding, the Load-Serving Entity identifies which critical customer loads should be excluded from curtailment for public health, safety and/or security reasons. o EOP-003-1 or the proposed EOP-003-2 and the proposed PRC-006 both address automatic UFLS -- only one standard should address the automatic UFLS -- two standards lead to confusion and potential double jeopardy. **Response:** The standard drafting team made modifications to the EOP-003 requirements that clarify that the load shedding referred to in the requirements excludes automatic under-frequency load shedding. o The proposed measures are vague, not specific and not performance based which leave too much up to the Auditor’s interpretation. **Response:** The SDT thinks that the Measures identify the evidence or types of evidence needed to demonstrate compliance with the associated requirement. The SDT thinks that the commenter is proposing that the SDT propose the RSAW not the Measures.

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				o The proposed requirements are not well defined and are hard to apply in some cases, which leads to a problem with the proposed "Violation Severity Levels". Unclear and not well defined requirements cause a disconnect with the Violation Severity Levels. o The proposed standard does not require coordination within the interconnection. The standard should require the PCs within an interconnection to coordinate a UFLS Design with all other PCs within the interconnection and that the PCs should be required to develop a coordinated interconnection wide UFLS Design. **Response:** The SDT has made conforming changes to the proposed standard that address many of the concerns highlighted in the comments received during the third posting. Please see the revised standard. o The primary purpose of the UFLS Plan is designed to mitigate the need to form islands by balancing loads and resources. It is a secondary function to balance the loads and resources after the islands have been formed. It appears the Drafting Team focused on the islanding event rather than assuring the interconnection integrity is maintained. Frequency is an interconnection issue not an individual island issue and therefore not driven by an individual PC but by a coordination of PCs effort within the interconnection. **Response:** The SDT agrees that interconnection coordinated UFLS plans are desirable, but the degree of diversity of systems in various regions, particularly in the Eastern Interconnection, makes this an unrealistic goal for a continent-wide standard; some flexibility needs to be reserved to address regional needs. The SDT agrees that frequency is an interconnection issue, but also acknowledges that, should an island form, frequency becomes an island issue also. The SDT does not believe that designating islands as a secondary function of UFLS is a distinction useful for reliability because most UFLS operations are seen to occur following island formation. o The WECC UFLS-DT believes there should be recognized sub-area groups, (consisting of PCs, as assigned by the Reliability Assurer (RA)). These sub-groups would be the agent for the PCs, and would assure the overall coordination within the interconnection. For example, the WECC RA recognizes the following sub-areas for UFLS coordination within the Western Interconnection (WI): Southern Islanding Load Tripping Group, the Northwest Power Pool UFLS group and the WECC Off Nominal Frequency Load and Restoration Plan. Without the RA assuring coordination of the sub-groups, PCs could randomly form sub-area groups whose plans may not coordinate on an interconnection wide basis or even address the interconnection reliability needs, but coordinated among the randomly formed sub-groups. **Response:** Instead of assigning responsibility to the Reliability Assurer the standard drafting team revised Requirements R5 and R13 to define a set of actions that are measureable that will demonstrate that Planning Coordinators worked together should an island span more than one Planning Coordinator area. The standard drafting team confirms that the Planning Coordinator is the appropriate entity to design UFLS and

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				conduct the other UFLS related activities based on the definition of the Planning Coordinator in the Functional Model Version 5. o The proposed standards attempt to establish a continent wide with frequency-time curves and eliminate discrete set points. This approach fails to recognize the unique characteristics of the four individual interconnections. Frequency-time curves do not allow for specific and defined measurements and will leave individual entities defaulting to the lowest common denominator. If frequency-time curves are intended to define the boundaries, the determination of discrete set points would fall into the hands of the PCs leading to disagreements among entities. In addition, to determine the frequency-time curves through stability and dynamic modeling, one must establish discrete set points. Frequency-time curves are reverse engineering and require justification and correlation to the reliability of the interconnections - no such justification has been provided. **Response:** The SDT agrees that interconnection coordinated UFLS plans are desirable, but the degree of diversity of systems in various regions, particularly in the Eastern Interconnection, makes this an unrealistic goal for a continent-wide standard; some flexibility needs to be reserved to address regional needs. The SDT agrees that frequency is an interconnection issue, but also acknowledges that, should an island form, frequency becomes an island issue also. The SDT does not believe that designating islands as a secondary function of UFLS is a distinction useful for reliability because most UFLS operations are seen to occur following island formation.
Claudiu Cadar	GDS Associates, Inc.	1	Negative	Besides the commented answers to the NERC questions within the comment form, GDS Associates has the following additional comments as follows: - Effective Date. Depending on when this standard is mandatory and enforceable, it may fall between entities' budgeting periods. An 18 months implementation would allow for all entities to budget the funds necessary to implement the standard. **Response:** The standard drafting team received feedback that many of the existing UFLS programs meet the performance characteristics in the proposed standard. Once this standard is approved the entities with existing programs would need a year to validate their program and validate the schedule for implementation with the UFLS entities. - Requirement R8. How the UFLS entity suppose to provide data to the Planning Coordinator and when is suppose to do that? The Planning Coordinator can make its UFLS database available within 30 days upon request (see Requirement R7.) **Response:** The standard drafting team added a requirement to the proposed standard to collect and respond to comments on the UFLS program, schedule for implementation and for the collection of data for the UFLS database (Requirement R14). - Requirement R9, R10. What if the UFLS entity does not agree with Planning Coordinator's assessment? - Requirement R10 should be further elaborated - Measure M10. There is no BES term for "automatic switching". The measure should be reworded

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				for a clear understanding. **Response:** The standard drafting team added a requirement to the proposed standard to collect and respond to comments on the UFLS program, schedule for implementation and for the collection of data for the UFLS database (Requirement R14). The team modified Requirement R10 to clarify that it means: "switching of capacitor banks, Transmission Lines, and reactors" in order to control over voltage as a result of under frequency load shedding.
Christopher L de Graffenried	Consolidated Edison Co. of New York	1	Negative	Comment: NPCC has already implemented a Region specific UFLS Program incorporating a six year UFLS implementation plan, with year one of the plan having ended June, 2010. As such, Con Edison is concerned with how this version of PRC-006 might impact the NPCC Regional UFLS Standard. Applicability of the standard, as proposed, excludes inclusion of generators; however, R4 requires PCs to model generator specific information. This represents a missing link that needs to be addressed before the standard can be approved.
Response: The standard drafting team provided clarifying examples in the implementation schedule to clarify that entities with existing programs and schedules for implementation will need to validate their existing programs against the standard's requirements and collect feedback from the UFLS entities as required by the standard.				
Larry Akens	Tennessee Valley Authority	1	Negative	Comments associated with the negative vote are contained in the Project 2007-01 comment form submitted by TVA
Marjorie S. Parsons	Tennessee Valley Authority	6	Negative	
Response: Please see our response to your comments in the consideration of comments report.				
John Bussman	Associated Electric Cooperative, Inc.	1	Negative	comments provided on comment form
Response: Please see our response to your comments in the consideration of comments report.				
Robert W. Roddy	Dairyland Power Coop.	1	Negative	concerned that generation limits are too conservative.
Response: Please see our response to your comments in the consideration of comments report.				
Russell A Noble	Cowlitz County PUD	3	Negative	Cowlitz believes the comments of BPA and WECC concerning the current draft of the Standard need to be addressed before a positive vote can be cast.

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Rick Syring	Cowlitz County PUD	4	Negative	**Response:** Please see our response to your comments in the consideration of comments report. One troubling aspect is the current ownership of UFLS relays by end-use customers, put in place during the voluntary compliance reliability era. These relays, buried deep into the customer's plant is necessary to allow safe load shedding. Placing the relays in the Distribution Provider's facilities is not possible without compromising the safety of plant personnel or the loss of significant plant product and equipment due to an uncontrolled plant shut down. In such situations, it is not palatable to require end-use customers to register; it is also not fair to force the Distribution Provider to negotiate with the customer, assuming the DP and LSE are not the same entity. Therefore, it is the LSE who must deal with the customer and the subsequent negotiation of contract agreements for the maintenance of customer owned equipment necessary for UFLS. It must be strongly noted that the LSE should not be required to own, or maintain the equipment. The LSE can only act as the reliability emissary in negotiating with the customer in this regard, however it is difficult to pass on any consequence of reliability violations to the customer. Should the customer be remiss in the upkeep of the relays, the LSE is then subject to compliance penalties over actions it has little control of. Also keep in mind of the complexity of PRC-005-2 applicability to the customer's electrical facilities due to the UFLS relay present there. This is truly a compliance nightmare of great concern to Cowlitz. **Response:** The SDT recognizes that the Functional Model Version 5 and the Statement of Compliance Registry cause confusion regarding the involvement of the LSE in UFLS programs but the SDT refers to the section covering the Roles in Load Curtailment in version 5 of the Functional Model Technical Document; "For non-voluntary curtailment, such as automatic underfrequency and undervoltage load shedding and manual load shedding, the Load-Serving Entity identifies which critical customer loads should be excluded from curtailment for public health, safety and/or security reasons.
Bob Essex	Cowlitz County PUD	5	Negative	
Paul Morland	Colorado Springs Utilities	1	Negative	CSU offers the following comments: R3 (Attachments) It is not clear how attachment 1 should be used. Are the curves performance curves? Set point curves? R10 Need more clarity on what is meant by "Automatic Switching of Elements"? Does it mean a TO needs to automatically switch capacitor banks to avoid overvoltages?
Response: The SDT believes that there is confusion concerning the application of the curves. The goal of the UFLS is to control frequency during a UFLS event such that generation does not trip. Project 2007-09 Generator Verification for draft Standard PRC-024 is developing the curves to establish the over- and under-frequency protection for the generation, so, the UFLS SDT is trying to stay within those curves by some margin, e.g., between the two curves of Attachment 1 and 2. The SDT recognizes that some generators may not meet those curves and wants the PC to specifically model the trip settings of those generators. We understand that V/Hz is not a standard output, but, it should not be a large effort to monitor voltage and frequency, divide the two, and integrate over each time step. The SDT received many comments on prior versions of this standard to make sure PRC-006 was coordinated with PRC-024 as the two were being drafted. We are taking the direction of the majority of commenters.				
John K	Dominion Virginia	1	Negative	Currently there is no requirement for Generator Owners to provide trip settings for non-

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Loftis	Power			conforming units to the Planning Coordinator. Absent such a requirement, the responsibility for compliance would be placed on the Transmission Owner. We are aware that PRC-024 (Project 2007-09) contains reporting requirements (R3, R4 and R5) but are not certain that the tables in PRC-024 match those in PRC-006 nor is there any guarantee that PRC-024 will be FERC approved without change. So, we suggest the addition of a requirement (applicable to the Generator Owner) to provide the information (as needed in R3-R3.3.3) to the Planning Coordinator.
Michael F Gildea	Dominion Resources Services	3	Negative	
Mike Garton	Dominion Resources, Inc.	5	Negative	
Louis S Slade	Dominion Resources, Inc.	6	Negative	
Response: The SDT believes that there is confusion concerning the application of the curves. The goal of the UFLS is to control frequency during a UFLS event such that generation does not trip. Project 2007-09 Generator Verification for draft Standard PRC-024 is developing the curves to establish the over- and under-frequency protection for the generation, so, the UFLS SDT is trying to stay within those curves by some margin, e.g., between the two curves of Attachment 1 and 2. The SDT recognizes that some generators may not meet those curves and wants the PC to specifically model the trip settings of those generators. We understand that V/Hz is not a standard output, but, it should not be a large effort to monitor voltage and frequency, divide the two, and integrate over each time step. The SDT received many comments on prior versions of this standard to make sure PRC-006 was coordinated with PRC-024 as the two were being drafted. We are taking the direction of the majority of commenters.				
Stanley M Jaskot	Entergy Corporation	5	Negative	Entergy reserves the right, after review of all the submitted ballots, to join with other balloters, whether positive or negative ballots, where any reasons included in their ballot that may be applicable to or otherwise impact Entergy as related to this ballot. All of the following Reasons are directed at the revisions applied to PRC-006-1. We agree with the EOP-003-1 revisions. I n M3 it is unclear what action is intended by the phrase “including the criteria itself”. Since the criteria is specified in R3, it is recommended that the phrase be deleted. R5 and M5 should only apply to Planning Coordinators (PC) who are part of the joint island, while the way it is currently worded it appears to apply to every PC. We recommend the wording in M5 be changed to: “Each Planning Coordinator shall have dated evidence such as memorandums, letters, or other dated documentation that it reached concurrence with the other affected Planning Coordinators on design assessment results for any identified island in accordance with Requirement R5 and identifies the affected Planning Coordinators.” We also recommend that the wording in R5 be changed to: “Each Planning Coordinator shall reach concurrence with all other affected Planning Coordinators in UFLS design assessment results before design assessment completion for any island identified by that Planning Coordinator which include a portion of its footprint along with portions of another PC(s) footprint.”

Voter	Entity	Segment	Vote	Comment
				The Lower VSL for R11 appears to simply repeat the requirement rather than stating a violation. We recommend that the time ranges for the VSLs addressing being late with the assessment should be expanded to Moderate - 12-14 months, High - 14-16 months, and Severe - greater than 16 months. We also recommend that the High and Severe VSLs that contain the phrase "shall conduct and document" to read "conducted and documented". The VSLs for R4 should include a consideration of the timeliness of the completion of the study (e.g. Lower VSL for 3 months late, Moderate VSL for 3 to 6 months late, etc.) The standard R5 requires that both or all the Planning Coordinators agree. One PC might have larger margin requirements or a different methodology compared to another PC. These differences might not be reconcilable. We do not believe that a standard can require that one PC change its methods because a different PC does not agree with its methods, or agree that another method (any method) is acceptable that it finds a problem with. There at least needs to be a process in the event that two PCs cannot agree. We recommend that the following language be added to R5: "If concurrence cannot be reached, an individual Planning Coordinator in that island can demonstrate that its UFLS scheme meets the requirements by performing dynamic simulations that apply its UFLS scheme on the entire island." We recommend that R13 be eliminated since it is covered by R11. We recommend that R3 be revised to require the PC to specifically notify each of the "UFLS Entities" in their PC area that are part of the PC's UFLS program of the UFLS program. We are also concerned that the Planning Coordinator is responsible to develop a UFLS program that incorporates information from Generator Owners (R3-R3.3.3) but there is no requirement that Generator Owners provide this information. We are aware that PRC-024 (Project 2007-09) contains reporting requirements (R3, R4 and R5) but are not certain that the tables in PRC-024 match those in PRC-006 nor is there any guarantee that PRC-024 will be FERC approved without change. Therefore, we request that this standard be made applicable to GOs and those GOs provide the required information. The Unofficial Comment Form for this standard, in the Review of Technical Changes to Standard section contains the following statement "The SDT has added requirements to include an assessment of the performance of UFLS programs "within one year of an actuation of UFLS resulting in 500 MW or greater of loss of load."(Requirement R11)." However the 500 MW limitation is not included in R11. We recommend this 500 MW limitation be added to R11. There is no need to evaluate smaller islanding events.
Response: Please see our response to your comments in the consideration of comments report.				

Voter	Entity	Segment	Vote	Comment
Thomas C. Mielnik	MidAmerican Energy Co.	3	Negative	Entities should be required to inform neighbors of the assessment results rather than reaching concurrence. With the approach currently in the standard, an entity could potentially be held responsible for inaction of another planning coordinator. The language should say, "Each Transmission Operator and Balancing Authority shall coordinater load shedding plans among other interconnected entities." Also MidAmerican notes that under frequency event analyses are complex. Therefore, the minimum time frames for anlysis and implementation should be increased to at least 2 years and exception requests for additional time should be allowed.
Response: In the third version of the standard Requirement R5 and R13 required concurrence between Planning Coordinators if an island encompassed more than on Planning Coordinator area. Instead of assigning responsibility to the Reliability Assurer the standard drafting team revised Requirements R5 and R13 to define a set of actions that are measureable that will demonstrate that Planning Coordinators worked together should an island span more than one Planning Coordinator area. The standard drafting team confirms that the Planning Coordinator is the appropriate entity to design UFLS and conduct the other UFLS related activities based on the definition of the Planning Coordinator in the Functional Model Version 5.				
Gordon Rawlings	BC Transmission Corporation	1	Negative	EOP-003-1 - BC Hydro does not agree with the EOP-003-1 changes. BC Hydro believes that the standard should not be specific to UVLS plans but rather on load shedding plans which may include AUVLS, AUFLS and manual load shedding. If EOP-003 is only for UVLS we don't know how we would be expected to "coordinate" this with other BA's. **Response:** The standard drafting team received several comments on EOP-003 that expressed concern that the removal of under-frequency load shedding in the standard was not clear enough. The standard drafting team made additional modifications to the EOP-003 requirements that clarify that the load shedding referred to in the requirements excludes automatic under-frequency load shedding. There is another NERC project tasked with making comprehensive revisions to EOP-003. The intent of the supplemental SAR was to focus solely on removing conflicts and redundancies related to underfrequency load shedding in EOP-003-1. PRC-006-1 The frequency performance requirements may vary depending on individual system characteristics. NERC standard on AULS should stay at a high level. The detailed requirements should be left to subgroups to deal with based on their uniqueness and coordinate within their interconnections. - The standards should mainly deal with under-frequency load shedding. The frequency performance on generators should be left to generation interconnection or planning standards. **Response:** The SDT believes that there is confusion concerning the application of the curves. The goal of the UFLS is to control frequency during a UFLS event such that generation does not trip. Project 2007-09 Generator Verification for draft Standard PRC-024 is developing the curves to establish the over- and under-frequency protection for the generation, so, the UFLS SDT is trying to stay within those curves by some margin, e.g., between the two curves of Attachment 1. The SDT recognizes that some generators may not meet those curves and wants the PC to specifically model the trip settings of those

Voter	Entity	Segment	Vote	Comment
				generators. We understand that V/Hz is not a standard output, but, it should not be a large effort to monitor voltage and frequency, divide the two, and integrate over each time step. The SDT received many comments on prior versions of this standard to make sure PRC-006 was coordinated with PRC-024 as the two were being drafted. We are taking the direction of the majority of commenters.
Daniel Brotzman	Commonwealth Edison Co.	1	Negative	EOP-003-1 needs to define the criteria as to when and how UVLS schemes are installed to provide consistency direction to Planning Coordinators and the entities that have to install UVLS schemes. The relationship between the use of UVLS and compliance with TPL-001 standards should be clarified. Is load shedding (including UVLS) allowed to meet the performance criteria in TPL-001? The standard should define when UVLS are applicable to the BES and thus subject to the requirements of EOP-003. UVLS schemes developed for distribution or other purposes beyond criteria should not be discouraged through regulatory burden. UVLS should be carefully defined. Many types of load will cut out on low voltage. **Response:** The standard drafting team received several comments on EOP-003 that expressed concern that the removal of under-frequency load shedding in the standard was not clear enough. The standard drafting team made additional modifications to the EOP-003 requirements that clarify that the load shedding referred to in the requirements exclude automatic under-frequency load shedding. There is another NERC project tasked with making comprehensive revisions to EOP-003. The intent of the supplemental SAR was to focus solely on removing conflicts and redundancies related to underfrequency load shedding in EOP-003-1. PRC-006-01: The standard lacks guidance as to what the trip settings should be. It is not clear as to how Attachment 1 should be used and doesn't provide specific detail for under frequency set points. Exelon disagrees that R3.3 is easier to understand. Clarification is needed as to where the underfrequency set points are. Do all entities contribute equally to Attachment 1? There needs to be a standardized relationship between GO and TO/DP participation in obtaining the desired level of system performance. There should also be explicit criteria as to what the expectations are for each individual entity. It should be clear that all UFLS entities are to participate equally and that larger entities will not be expected to carry the burden for smaller entities. There should be some recognition in the standard that UFLS schemes currently exist and effort should be made to avoid needlessly changing relays or settings on many thousands of installations if some arbitrary and common set points were to be determined by the PC, thus causing needless expense. It is likely desirable to have slightly different settings for UFLS across a footprint so as to not create load changes that are too abrupt. The current practice of allowing contractual agreements between GOs and DPs for additional load shedding as a voluntary business decision, in the event that a unit owner doesn't comply with the unit trip settings should be addressed. Exelon does not agree with

Voter	Entity	Segment	Vote	Comment
				the concept of allowing neighboring Planning Coordinators to define or modify islanding criteria. **Response:** The SDT believes that there is confusion concerning the application of the curves. The goal of the UFLS is to control frequency during a UFLS event such that generation does not trip. Project 2007-09 Generator Verification for draft Standard PRC-024 is developing the curves to establish the over- and under-frequency protection for the generation, so, the UFLS SDT is trying to stay within those curves by some margin, e.g., between the two curves of Attachment 1. The SDT recognizes that some generators may not meet those curves and wants the PC to specifically model the trip settings of those generators. We understand that V/Hz is not a standard output, but, it should not be a large effort to monitor voltage and frequency, divide the two, and integrate over each time step. The SDT received many comments on prior versions of this standard to make sure PRC-006 was coordinated with PRC-024 as the two were being drafted. We are taking the direction of the majority of commenters. There should be a single criteria for the determination of an island which is consistent across the interconnection, unless a specific geographic or regional exception is identified. Even if differing islanding criteria are allowed for each PC, the Planning Coordinator with responsibility for the footprint should have sole authority for determining and modifying the criteria within that footprint. **Response:** The proposed standard requires the Planning Coordinators to establish the criteria for selecting islands and does not allow another Planning Coordinator to modify the criteria established in Requirement R1.
Robert Martinko	FirstEnergy Energy Delivery	1	Negative	FirstEnergy appreciates the hard work of the drafting team, but unfortunately we must cast a Negative vote for the standard as written. Although we agree that the Planning Coordinator is the appropriate functional entity to develop and implement a UFLS program, we are concerned with the fact that UFLS entities may not know the specifics of their responsibilities until long after this standard is approved. The SDT should consider adjusting the language of the standard to require more transparency and coordination with the UFLS entities during the PC's development of the UFLS program. Also, per the implementation plan, the PC will be given one year to develop its UFLS program. However, the timeframe for the UFLS entity is based on the schedule imposed by the PC. The implementation plan should allow the UFLS entity at least one year (maybe more per capital budget cycles) from the time the PC identifies the UFLS entity in
Kevin Querry	FirstEnergy Solutions	3	Negative	

Voter	Entity	Segment	Vote	Comment
Douglas Hohlbaugh	Ohio Edison Company	4	Negative	their UFLS program. The UFLS entity will need sufficient lead time in those instances that require purchase of new UFLS equipment that will require long term budget planning for implementation. The UFLS entities are identified in the UFLS program established by the PC. However, it is not clear where the PC is explicitly required to notify and coordinate with the UFLS entity. In Requirement R3 it is implied that the PC will notify and coordinate with the UFLS entity per the phrase “including a schedule for implementation by UFLS entities within its footprint”. This requirement needs to be more explicit that the PC will notify the UFLS entity, and the measure for R3 needs to require proof that the PC has done this. We are concerned about the coordination between this UFLS SDT and the GV SDT. It will be difficult to approve and begin implementing the PRC-006-1 standard while the PRC-024-1 standard is still under development and scheduled for approval and implementation at a much later date. For these requirements to be adequately coordinated, the two standards need to be developed, balloted and implemented at the same time. Alternatively, consider adding the following statement in the PRC-006-1 Implementation Plan: "The Effective Date and implementation of this PRC-006-1 standard requires coordination with standard PRC-024-1. Excluding requirement R1, the Effective Date of PRC-006 shall be the later of 1) the completion of the Implementation Plan for PRC-006 or 2) the completion of the Effective Date of the PRC-024-1 standard upon completion of its Implementation Plan." **Response:** The SDT added a requirement to the proposed standard, Requirement R14, to ensure that the Planning Coordinators collect and respond to comments submitted by UFLS entities on the UFLS program, including a schedule for implementation and UFLS design assessment.
Kenneth Dresner	FirstEnergy Solutions	5	Negative	
Mark S Travaglianti	FirstEnergy Solutions	6	Negative	FirstEnergy appreciates the hard work of the drafting team, but unfortunately we must cast a Negative vote. Since we do not agree with the standard requirements and have cast a negative vote for the standard, we therefore do not agree with the VSL for the requirements as written.
Response: The SDT has made conforming changes to the proposed standard that address many of the concerns highlighted in the comments received during the third posting. Please see the revised standard.				

Voter	Entity	Segment	Vote	Comment
James A Ziebarth	Y-W Electric Association, Inc.	4	Negative	From Question 3 on the comment form: Regarding the VSLs for R8, the UFLS entities cannot be punished for failing to meet a schedule if the schedule is not mutually agreed upon between the Planning Coordinator and the UFLS entities to ensure that the UFLS entities are capable of meeting such a schedule. At the very least, there must be some protection for the UFLS entities provided that requires the Planning Coordinator(s) to give the UFLS entities long-term notice of the deadlines that they will need to meet. The lack of any scheduling restrictions for the Planning Coordinators in the standard as written has a strong potential to cause enormous burdens on small UFLS entities that simply do not possess the resources to deal with such data reporting requirements without sufficient advance notice. Additionally, the UFLS entities cannot be penalized for failing to submit data in a format over which they have no control or input. The Planning Coordinator should be required to consult with the UFLS entities and decide upon a mutually agreeable data format in order to ensure that the UFLS entities are capable of providing the required data in the required format. With no language in the standard limiting or clarifying what data can be required of the UFLS entities by the Planning Coordinator, this provision at least should be made to protect small UFLS entities with highly limited resources for dealing with such data reporting requirements. From Question 8 on the comment form: Because Load Serving Entities (not Distribution Providers) are actually responsible for the load in the current Functional Model and Compliance Registry Criteria, they should also be included in the applicability section of this standard. From Question 12 on the comment form: Y-WEA is concerned about this requirement in that it seems to require the installation of facilities rather than just relays. 16 USC 824o (a)(3) gives NERC the authority to regulate existing facilities and planned additions or modifications to those facilities, not to prompt or require modifications or additions to the existing facilities. This proposed requirement seems to run afoul of this section of the USC.
Response: The SDT added a requirement to the proposed standard, Requirement R14, to ensure that the Planning Coordinators collect and respond to comments submitted by UFLS entities on the UFLS program, including a schedule for implementation and UFLS design assessment.				
Kim Warren	Independent Electricity System Operator	2	Negative	Generator owners are not included in the Applicability Section of this standard. We understand from the SDT's responses to the last posting that there is a separate project for generator requirements that would obligate them to provide the required information to the Planning Coordinators with which to design the underfrequency load shedding program. Absent that standard, a Generator Owner has no obligation to provide the necessary data to the Planning Coordinators which can result in the Planning Coordinator failing to meet the PRC-006-1 standard. We therefore request that Generator Owner be included in the Applicability Section and a requirement for it to provide the needed information to the Planning Coordinator be added, or balloting of standard PRC-006-1 be deferred until such a requirement in that other standard is ready for balloting.

Voter	Entity	Segment	Vote	Comment
Response: Many commenters indicated that Generator Owners should be included in the applicability of the standard. Some suggested including a data requirement in PRC-006-1 that requires the Generator Owners to submit the necessary data to accomplish Requirement R4; however, the team felt that because such a data requirement already exists in PRC-024 and because the team has clarified in the effective date of the standard that the sub-parts related to generators will not be effective until PRC-024 is approved and effective that adding such a data requirement to PRC-006 would be redundant and possibly cause double jeopardy concerns.				
Terry Harbour	MidAmerican Energy Co.	1	Negative	Instead of reaching concurrence, entities should be just required to inform neighbors of the assessment results. Otherwise entities could potentially be held responsible for inaction of another planning coordinator. The language could be changed to be consistent with the language in EOP-003 R3, such as, "Each Transmission Operator and Balancing Authority shall coordinate load shedding plans among other interconnected (entities)". MidAmerican notes that past under frequency event analyses are complex and that the minimum time frames for analysis and implementation should be increased to at least 2 years and exception requests for additional time should be allowed.
Response: In the third version of the standard Requirement R5 and R13 required concurrence between Planning Coordinators if an island encompassed more than on Planning Coordinator area. Instead of assigning responsibility to the Reliability Assurer the standard drafting team revised Requirements R5 and R13 to define a set of actions that are measureable that will demonstrate that Planning Coordinators worked together should an island span more than one Planning Coordinator area. The standard drafting team confirms that the Planning Coordinator is the appropriate entity to design UFLS and conduct the other UFLS related activities based on the definition of the Planning Coordinator in the Functional Model Version 5.				
Michael Gammon	Kansas City Power & Light Co.	1	Negative	It is unclear from the Standard that not forming islands in UFLS design is acceptable. Recommend the SDT consider including language to clarify that is not mandatory that system islands by formed in every UFLS design configuration.
Charles Locke	Kansas City Power & Light Co.	3	Negative	
Scott Heidtbrink	Kansas City Power & Light Co.	5	Negative	
Thomas Saitta	Kansas City Power & Light Co.	6	Negative	
Response: The proposed standard requires that an island be the basis of UFLS program design – at a minimum Requirement R2 part 2.3 A single island that includes all portions of the BES in either the Regional Entity footprint or the Interconnection in which the Planning Coordinator's area resides. If a Planning Coordinator's area resides in multiple Regional Entity areas, each of those Regional Entity areas shall be identified as an island.				

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Michael Moltane	International Transmission Company Holdings Corp	1	Negative	ITC Holdings strongly suggests that the "planning coordinator" as it relates to UFLS be clearly defined. As written throughout the standard, ITC would be responsible for planning UFLS when we don't own any such systems. Due to the huge impact the definition of "planning coordinator" has on this standard, and the ambiguity that exists with the definition of this entity, ITC must vote negative
Response: An entity that is registered as the Planning Coordinator (or the previous name for the function – Planning Authority), must be prepared to accept responsibility for the requirements assigned to that function. The terms Planning Authority and Planning Coordinator have the same meaning, and are defined in the NERC Glossary of Terms Used in Reliability Standards. The Planning Coordinator does not necessarily own UFLS systems but rather coordinates the planning of such systems among the entities that own, operate and control UFLS.				
Terri F Benoit	Entergy Services, Inc.	6	Negative	NEGATIVE BALLOT WITH REASONS Entergy Ballot PROJECT 2007-01 UNDERFREQUENCY LOAD SHEDDING PROGRAM REQUIREMENTS Ballot Ending July 16, 2010 The following are the reasons associated with our Negative Ballot. Entergy reserves the right, after review of all the submitted ballots, to join with other balloters, whether positive or negative ballots, where any reasons included in their ballot that may be applicable to or otherwise impact Entergy as related to this ballot. All of the following Reasons are directed at the revisions applied to PRC-006-1. We agree with the EOP-003-1 revisions. In M3 it is unclear what action is intended by the phrase “including the criteria itself”. Since the criteria is specified in R3, it is recommended that the phrase be deleted. R5 and M5 should only apply to Planning Coordinators (PC) who are part of the joint island, while the way it is currently worded it appears to apply to every PC. We recommend the wording in M5 be changed to: “Each Planning Coordinator shall have dated evidence such as memorandums, letters, or other dated documentation that it reached concurrence with the other affected Planning Coordinators on design assessment results for any identified island in accordance with Requirement R5 and identifies the affected Planning Coordinators.” We also recommend that the wording in R5 be changed to: “Each Planning Coordinator shall reach concurrence with all other affected Planning Coordinators in UFLS design assessment results before design assessment completion for any island identified by that Planning Coordinator which include a portion of its footprint along with portions of another PC(s) footprint.” The Lower VSL for R11 appears to simply repeat the requirement rather than stating a violation. We recommend that the time ranges for the VSLs addressing being late with the assessment should be expanded to Moderate - 12-14 months, High - 14-16 months, and Severe - greater than 16 months. We also recommend that the High and Severe VSLs that contain the phrase “shall conduct and document” to read “conducted and documented”. The VSLs for R4 should include a consideration of the timeliness of the completion of the study (e.g. Lower VSL for 3 months late, Moderate VSL for 3 to 6 months late, etc.) The standard R5 requires that both or all the Planning Coordinators agree. One PC might have larger margin requirements or a different methodology compared to another PC. These differences might not be reconcilable. We do not believe that a standard can require that one PC

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				change its methods because a different PC does not agree with its methods, or agree that another method (any method) is acceptable that it finds a problem with. There at least needs to be a process in the event that two PCs cannot agree. We recommend that the following language be added to R5: "If concurrence cannot be reached, an individual Planning Coordinator in that island can demonstrate that its UFLS scheme meets the requirements by performing dynamic simulations that apply its UFLS scheme on the entire island." We recommend that R13 be eliminated since it is covered by R11. We recommend that R3 be revised to require the PC to specifically notify each of the "UFLS Entities" in their PC area that are part of the PC's UFLS program of the UFLS program. We are also concerned that the Planning Coordinator is responsible to develop a UFLS program that incorporates information from Generator Owners (R3-R3.3.3) but there is no requirement that Generator Owners provide this information. We are aware that PRC-024 (Project 2007-09) contains reporting requirements (R3, R4 and R5) but are not certain that the tables in PRC-024 match those in PRC-006 nor is there any guarantee that PRC-024 will be FERC approved without change. Therefore, we request that this standard be made applicable to GOs and those GOs provide the required information. The Unofficial Comment Form for this standard, in the Review of Technical Changes to Standard section contains the following statement "The SDT has added requirements to include an assessment of the performance of UFLS programs "within one year of an actuation of UFLS resulting in 500 MW or greater of loss of load."(Requirement R11)." However the 500 MW limitation is not included in R11. We recommend this 500 MW limitation be added to R11. There is no need to evaluate smaller islanding events.
Response: The SDT has made conforming changes to the proposed standard that address many of the concerns highlighted in the comments received during the third posting. Please see the revised standard.				
Richard Salgo	Sierra Pacific Power Co.	1	Negative	Negative vote prompted by several concerns: First, the Standards as proposed are a disturbing departure from the present practice of Regional and Interconnection-wide coordination of off-nominal frequency protection. We feel that it must be approached on an Interconnection-wide basis, not as individual Planning Coordinators. The goal should be that the Planning Coordinators develop a coordinated interconnection-wide off-nominal frequency scheme design. This is imperative to ensure adequate UFLS protection across the Interconnection. Secondly, applicability does not appear to include entities who must be responsible to ensure that the UFLS is carried out, for instance, the LSE's and DP's that necessarily must implement the prescribed UFLS protection devices at the distribution level. Finally, we disagree with the concept of frequency-vs-time curves, as this approach will fall short of addressing the unique characteristics of the various NERC Interconnections.
Response: The SDT believes that there is confusion concerning the application of the curves. The goal of the UFLS is to control frequency during a UFLS event such that generation does not trip. Project 2007-09 Generator Verification for draft Standard PRC-024 is developing the curves to establish the over- and under-frequency protection for the generation, so, the UFLS SDT is trying to stay				

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within those curves by some margin, e.g., between the two curves of Attachment 1. The SDT recognizes that some generators may not meet those curves and wants the PC to specifically model the trip settings of those generators. We understand that V/Hz is not a standard output, but, it should not be a large effort to monitor voltage and frequency, divide the two, and integrate over each time step. The SDT received many comments on prior versions of this standard to make sure PRC-006 was coordinated with PRC-024 as the two were being drafted. We are taking the direction of the majority of commenters. Several commenters indicated that LSEs should be included in the applicability of the standard. The SDT recognizes that the Functional Model version 5 and the Statement of Compliance Registry cause confusion regarding the involvement of the LSE in UFLS programs but the SDT refers to the section covering the Roles in Load Curtailment in version 5 of the Functional Model Technical Document; "For non-voluntary curtailment, such as automatic underfrequency and undervoltage load shedding and manual load shedding, the Load-Serving Entity identifies which critical customer loads should be excluded from curtailment for public health, safety and/or security reasons.				
Peter T Yost	Consolidated Edison Co. of New York	3	Negative	NPCC has already implemented a Region specific UFLS Program incorporating a six year UFLS implementation plan, with year one of the plan having ended June, 2010. As such, Con Edison is concerned with how this version of PRC-006 might impact the NPCC Regional UFLS Standard. Applicability of PRC-006, as proposed, excludes inclusion of generators; however, R4 requires PCs to model generator specific information. This represents a missing link that needs to be addressed before the standard can be approved.
Nickesha P Carrol	Consolidated Edison Co. of New York	6	Negative	
Response: The standard drafting team received feedback that many of the existing UFLS programs meet the performance characteristics in the proposed standard. Once this standard is approved the entities with existing programs would need a year to validate their program and validate the schedule for implementation with the UFLS entities. A data requirement already exists in the proposed PRC-024 - the team has clarified in the effective date of the standard that the Parts of the requirement related to generators will not be effective until PRC-024 is approved and effective, that adding such a data requirement to PRC-006 would be redundant and possibly cause double jeopardy concerns.				
Greg Lange	Public Utility District No. 2 of Grant County	3	Negative	oThe proposed measures are vague, not specific and not performance based which leave too much up to the Auditor's interpretation. **Response:** The SDT thinks that the Measures identify the evidence or types of evidence needed to demonstrate compliance with the associated requirement. The SDT thinks that the commenter is proposing that the SDT propose the RSAW not the Measures. oThe proposed standard does not require coordination within the interconnection. The standard should require the PCs within an interconnection to coordinate a UFLS Design with all other PCs within the interconnection and that the PCs should be required to develop a coordinated interconnection wide UFLS Design. **Response:** The SDT agrees that interconnection coordinated UFLS plans are desirable, but the degree of diversity of systems in various regions, particularly in the Eastern Interconnection, makes this an unrealistic goal for a continent-wide standard; some flexibility needs to be reserved to address regional needs. The SDT agrees that frequency is an interconnection issue, but also acknowledges that, should an island form, frequency becomes an island issue also. The SDT does not believe that designating islands as a

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				secondary function of UFLS is a distinction useful for reliability because most UFLS operations are seen to occur following island formation. oThe primary purpose of the UFLS Plan is designed to mitigate the need to form islands by balancing loads and resources. It is a secondary function to balance the loads and resources after the islands have been formed. It appears the Drafting Team focused on the islanding event rather than assuring the interconnection integrity is maintained. Frequency is an interconnection issue not and individual island issue and therefore not driven by an individual PC but by a coordination of PCs effort within the interconnection. **Response:** The SDT agrees that interconnection coordinated UFLS plans are desirable, but the degree of diversity of systems in various regions, particularly in the Eastern Interconnection, makes this an unrealistic goal for a continent-wide standard; some flexibility needs to be reserved to address regional needs. The SDT agrees that frequency is an interconnection issue, but also acknowledges that, should an island form, frequency becomes an island issue also. The SDT does not believe that designating islands as a secondary function of UFLS is a distinction useful for reliability because most UFLS operations are seen to occur following island formation. o The WECC UFLS-DT believes there should be recognized sub-area groups, (consisting of PCs, as assigned by the Reliability Assurer (RA)). These sub-groups would be the agent for the PCs, and would assure the overall coordination within the interconnection. For example, the WECC RA recognizes the following sub-areas for UFLS coordination within the Western Interconnection (WI): Southern Islanding Load Tripping Group, the Northwest Power Pool UFLS group and the WECC Off Nominal Frequency Load and Restoration Plan. Without the RA assuring coordination of the sub-groups, PCs could randomly form sub-area groups whose plans may not coordinate on an interconnection wide basis or even address the interconnection reliability needs, but coordinated among the randomly formed sub-groups. The standard, requirements, and measurements should reflect the uniqueness of the individual interconnections and not common, continent wide prescriptions. **Response:** The fourth version of the proposed standard addresses the coordination issue many commenters expressed. Many commenters suggested that the Reliability Assurer be assigned responsibility for coordinating UFLS activities and for reaching concurrence. In the third version of the standard Requirement R5 and R13 required concurrence between Planning Coordinators if an island encompassed more than on Planning Coordinator area. Instead of assigning responsibility to the Reliability Assurer the standard drafting team revised Requirements R5 and R13 to define a set of actions that are measureable that will demonstrate that Planning Coordinators worked together should an island span more than one Planning Coordinator area. The standard drafting team confirms that the Planning Coordinator is the appropriate entity to design UFLS and conduct the other UFLS related activities based on the definition of the Planning

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				Coordinator in the Functional Model Version 5.
Richard J Kafka	Potomac Electric Power Co.	1	Negative	PHI submitted comments
Response: The SDT has made conforming changes to the proposed standard that address many of the concerns highlighted in the comments received during the third posting. Please see the revised standard.				
Francis J. Halpin	Bonneville Power Administration	5	Negative	Please see BPA's comments submitted during the formal comment period ending 7/17/10.
Rebecca Berdahl	Bonneville Power Administration	3	Negative	
Response: The SDT has made conforming changes to the proposed standard that address many of the concerns highlighted in the comments received during the third posting. Please see the revised standard.				
Ralph Frederick Meyer	Empire District Electric Co.	1	Negative	Prefer that a reliability standard requirement should to an entire entity class (per the Functional Model) not some sub-set of that entity. However, if the SDT determines to keep as indicated in this version, then we suggest that section 4 be revised to add clarity. Without the benefit of the background information above, the intent of the language in 4.2 and 4.3 could be lost. We suggest that section 4.2 be revised to read "UFLS entities shall mean all entities that are responsible for the ownership, operation, or control of UFLS equipment or automatic switching of Elements as required by the UFLS program established by the Planning Coordinators. Such entities may include one or more of the following: 4.2.1 Transmission Owners 4.2.2 Distribution Providers" and that 4.3 be deleted.
Response: Requirement R9 focuses on automatic tripping of load and may be performed by either the Distribution Provider or the Transmission Owner; Requirement R10 focuses on switching of devices to control over-voltage as a result of under frequency load shedding by the Transmission Owner (only). The switching of elements is generally performing at higher voltages than distribution voltages and as a result decided to not include the Distribution Providers in Requirement R10. This is the reason why the SDT did not merge Section 4 parts 4.2 and 4.3.				
Tim Hattaway	PowerSouth Energy Cooperative	5	Negative	R10 needs further clarification. One would assume that the "element" referred to is one that is essential to the correct function of the UFLS scheme?
Response: Commenters expressed that the wording in Requirement R10 "switching of elements" is confusing. The team modified Requirement R10 to clarify that it means: "switching of capacitor banks, Transmission Lines, and reactors" in order to control over voltage as a result of under frequency load shedding.				
Harold Taylor, II	Georgia Transmission Corporation	1	Negative	R3: Recommend diagrams to show the intended difference between 3.3.2 and 3.3.3. 3.3.2 should be "Generating Plants" (NO "/facilites") and 3.3.3 should be "Facilities". This would separate the combustion turbine or combined cycle generation which utilize common bus work from co-generation facilities that tie load and generation to a common utility substation bus.

Voter	Entity	Segment	Vote	Comment
				R5: What constitutes concurrence? 100% agreement? Can two or more Planning Coordinators with differing criteria reach a mutual agreement? R10: The use of upper case and lower case letters for emphasis can be confusing. What is the point of capitalizing "Elements"? Is it to imply switching a bulk load center from one island region to another and thus change the balance of generation to load in each island? Is the intent to enable or disable UF tripping for a given load center (substation) as it is transfered from one island region to another?
Response: The SDT believes that there is confusion concerning the application of the curves. The goal of the UFLS is to control frequency during a UFLS event such that generation does not trip. Project 2007-09 Generator Verification for draft Standard PRC-024 is developing the curves to establish the over- and under-frequency protection for the generation, so, the UFLS SDT is trying to stay within those curves by some margin, e.g., between the two curves of Attachment 1. The SDT recognizes that some generators may not meet those curves and wants the PC to specifically model the trip settings of those generators. We understand that V/Hz is not a standard output, but, it should not be a large effort to monitor voltage and frequency, divide the two, and integrate over each time step. The SDT received many comments on prior versions of this standard to make sure PRC-006 was coordinated with PRC-024 as the two were being drafted. We are taking the direction of the majority of commenters. No changes made. Commenters expressed that the wording in Requirement R10 “switching of elements” is confusing. The team modified Requirement R10 to clarify that it means: “switching of capacitor banks, Transmission Lines, and reactors” in order to control over voltage as a result of under frequency load shedding.				
Douglas E. Hils	Duke Energy Carolina	1	Negative	Requirements R5 and R13 contain the problematic requirement to “reach concurrence”, as discussed in our responses to the comment form. One way to address this concern would be to revise R5 and R13 to require affected Planning Coordinators to share design assessment results and event assessment results and respond to technical questions/comments within a prescribed time period.
Response: Many commenters suggested that the Reliability Assurer be assigned responsibility for coordinating UFLS activities and for reaching concurrence. In the third version of the standard Requirement R5 and R13 required concurrence between Planning Coordinators if an island encompassed more than on Planning Coordinator area. Instead of assigning responsibility to the Reliability Assurer the standard drafting team revised Requirements R5 and R13 to define a set of actions that are measureable that will demonstrate that Planning Coordinators worked together should an island span more than one Planning Coordinator area. The standard drafting team confirms that the Planning Coordinator is the appropriate entity to design UFLS and conduct the other UFLS related activities based on the definition of the Planning Coordinator in the Functional Model Version 5.				
Tom Bowe	PJM Interconnection, L.L.C.	2	Negative	SDT must define “design assessment”. Is it different from every other one of the other assessments conducted by the PC? Without clarification an RE is left with these questions: Is the requirement to conduct an assessment? Or is it to conduct an assement that sucessfully meets R3? Is the PC non-compliant when its area’s assets can not resolve the studied condition? Additionally, R12 is unclear in what it means by “event actuation”. Is the objective to run an assessment; or is the objective to “design” a solution to islands created during a planning assessment. Clarify meaning of event actuation. R11 can be read to mean “when that event occurred in the real system (i.e. was actuated) then an event analysis must be considered; or it can mean when an assessment shows the creation of an island, then the PC must devise a process or procedure to correct the

Voter	Entity	Segment	Vote	Comment
				incident within 1 year. The text is awkward.
Response: The objective of the design assessment is to verify that the design of the UFLS program satisfies R3. For the purposes of PRC-006, the design assessment needs to be distinguished only from the event assessment, which is an after-the-fact analysis of a UFLS event per R11. There are no other assessments required by this standard. It is required to conduct an assessment that shows the UFLS program design satisfies R3 for each of the identified islands from R2. A PC would be non-compliant if its UFLS program cannot satisfy the performance curves in the Attachments up to a 25 percent imbalance between load and generation while considering the sub-points specified in R4. The objective of the event assessment is to analyze events after-the-fact. Event actuation is the time when the event was initiated. The point of R12 is to follow up after an event assessment if the event assessment indicated that the UFLS program did not perform as well as expected, or that improvements may be possible. It is not required that improvements be made, only considered. R11 means "when that event occurred in the real system (i.e. was actuated) then an event analysis must be considered." The PC does not need to "devise a process or procedure to correct the incident within 1 year," though a PC may consider changes to the UFLS program design that might improve its performance in future events of a similar nature in R12.				
Mark Ringhausen	Old Dominion Electric Coop.	4	Negative	See my comments in the VRF/VSL ballot.
Response: Please see our response to your comments in the consideration of comments report.				
Ronald D. Schellberg	Idaho Power Company	1	Negative	The current proposal does not require coordination within the interconnection. The standard should require the PCs within an interconnection to coordinate a UFLS Design with all other PCs within the interconnection and that the PCs should be required to develop a coordinated interconnection wide UFLS Design. As proposed the standard could conceivably result in as many different UFLS plans within WECC as there are Planning Coordinators. WECC had a disturbance the was negatively impacted by the lack of cordination of UFLS between subregions. Continent wide Frequency-time curves would not account for the interconnection size.
Response: The SDT agrees that interconnection coordinated UFLS plans are desirable, but the degree of diversity of systems in various regions, particularly in the Eastern Interconnection, makes this an unrealistic goal for a continent-wide standard; some flexibility needs to be reserved to address regional needs. The SDT agrees that frequency is an interconnection issue, but also acknowledges that, should an island form, frequency becomes an island issue also. The SDT does not believe that designating islands as a secondary function of UFLS is a distinction useful for reliability because most UFLS operations are seen to occur following island formation.				
Laurie Williams	Public Service Company of New Mexico	1	Negative	The current proposal does not require coordination within the interconnection. The standard should require the PCs within an interconnection to coordinate a UFLS Design with all other PCs within the interconnection and that the PCs should be required to develop a coordinated interconnection wide UFLS Design. As proposed the standard could conceivably result in as many different UFLS plans within a Reliability Region as there are Planning Coordinators. Additionally, the proposed standard does not address

Voter	Entity	Segment	Vote	Comment
				UFLS relays which are currently part of the existing program which are owned by the customer. Recognition of customer owned relays is critical to have a successful program. To assure areas are covered the LSE needs to be included in the Applicability section. A third concern is the proposed standard attempts to establish continent wide frequency-time curves and eliminate discrete set points. This approach fails to recognize the unique characteristics of the four individual interconnections. Frequency-time curves do not allow for specific and defined measurements and will leave individual entities defaulting to the lowest common denominator. If frequency-time curves are intended to define the boundaries, the determination of discrete set points would fall into the hands of the PCs leading to disagreements among entities. In addition, to determine the frequency-time curves through stability and dynamic modeling, one must establish discrete set points. Frequency-time curves are reverse engineering and require justification and correlation to the reliability of the interconnections - no such justification has been provided.
Response: The SDT agrees that interconnection coordinated UFLS plans are desirable, but the degree of diversity of systems in various regions, particularly in the Eastern Interconnection, makes this an unrealistic goal for a continent-wide standard; some flexibility needs to be reserved to address regional needs. The SDT agrees that frequency is an interconnection issue, but also acknowledges that, should an island form, frequency becomes an island issue also. The SDT does not believe that designating islands as a secondary function of UFLS is a distinction useful for reliability because most UFLS operations are seen to occur following island formation. Several commenters indicated that LSEs should be included in the applicability of the standard. The SDT recognizes that the Functional Model Version 5 and the Statement of Compliance Registry cause confusion regarding the involvement of the LSE in UFLS programs but the SDT refers to the section covering the Roles in Load Curtailment in Version 5 of the Functional Model Technical Document; “For non-voluntary curtailment, such as automatic underfrequency and undervoltage load shedding and manual load shedding, the Load-Serving Entity identifies which critical customer loads should be excluded from curtailment for public health, safety and/or security reasons.				
Richard J. Padilla	Pacific Gas and Electric Company	5	Negative	The current proposal does not require coordination within the interconnection. The standard should require the PCs within an interconnection to coordinate a UFLS Design with all other PCs within the interconnection and that the PCs should be required to develop a coordinated interconnection wide UFLS Design. As proposed the standard could conceivably result in as many different UFLS plans within WECC as there are Planning Coordinators. The proposed standard fails to address UFLS relays which are currently part of the existing program which are owned by the customer. Recognition of customer owned relays is critical to have a successful program. To assure areas are covered the LSE needs to be included in the Applicability section. The proposed standard attempts to establish continent wide frequency-time curves and eliminate discrete set points. This approach fails to recognize the unique characteristics of the four individual interconnections. Frequency-time curves do not allow for specific and defined measurements and will leave individual entities defaulting to the lowest common denominator. If frequency-time curves are intended to define the boundaries, the determination of discrete set points would fall into the hands of the PCs leading to disagreements among entities. In addition, to determine the frequency-time curves

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				through stability and dynamic modeling, one must establish discrete set points. Frequency-time curves are reverse engineering and require justification and correlation to the reliability of the interconnections - no such justification has been provided.
Response: The SDT agrees that interconnection coordinated UFLS plans are desirable, but the degree of diversity of systems in various regions, particularly in the Eastern Interconnection, makes this an unrealistic goal for a continent-wide standard; some flexibility needs to be reserved to address regional needs. The SDT agrees that frequency is an interconnection issue, but also acknowledges that, should an island form, frequency becomes an island issue also. The SDT does not believe that designating islands as a secondary function of UFLS is a distinction useful for reliability because most UFLS operations are seen to occur following island formation. Several commenters indicated that LSEs should be included in the applicability of the standard. The SDT recognizes that the Functional Model Version 5 and the Statement of Compliance Registry cause confusion regarding the involvement of the LSE in UFLS programs but the SDT refers to the section covering the Roles in Load Curtailment in Version 5 of the Functional Model Technical Document; “For non-voluntary curtailment, such as automatic underfrequency and undervoltage load shedding and manual load shedding, the Load-Serving Entity identifies which critical customer loads should be excluded from curtailment for public health, safety and/or security reasons.				
William Mitchell Chamberlain	California Energy Commission	9	Negative	The current proposal does not require coordination within the interconnection. The standard should require the PCs within an interconnection to coordinate a UFLS Design with all other PCs within the interconnection and that the PCs should be required to develop a coordinated interconnection wide UFLS Design. As proposed the standard could conceivably result in as many different UFLS plans within WECC as there are Planning Coordinators. Additionally, the proposed standard fails to address UFLS relays which are currently part of the existing program which are owned by the customer. Recognition of customer owned relays is critical to have a successful program. To assure areas are covered the LSE needs to be included in the Applicability section. A third concern is the proposed standard attempts to establish continent wide frequency-time curves and eliminate discrete set points. This approach fails to recognize the unique characteristics of the four individual interconnections. Frequency-time curves do not allow for specific and defined measurements and will leave individual entities defaulting to the lowest common denominator. If frequency-time curves are intended to define the boundaries, the determination of discrete set points would fall into the hands of the PCs leading to disagreements among entities. In addition, to determine the frequency-time curves through stability and dynamic modeling, one must establish discrete set points. Frequency-time curves are reverse engineering and require justification and correlation to the reliability of the interconnections - no such justification has been provided.
Response: The SDT agrees that interconnection coordinated UFLS plans are desirable, but the degree of diversity of systems in various regions, particularly in the Eastern Interconnection, makes this an unrealistic goal for a continent-wide standard; some flexibility needs to be reserved to address regional needs. The SDT agrees that frequency is an interconnection issue, but also acknowledges that, should an island form, frequency becomes an island issue also. The SDT does not believe that designating islands as a secondary function of UFLS is a distinction useful for reliability because most UFLS operations are seen to occur following island formation. Several commenters indicated that LSEs should be included in the applicability of the standard. The SDT recognizes that the Functional Model Version 5				

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and the Statement of Compliance Registry cause confusion regarding the involvement of the LSE in UFLS programs but the SDT refers to the section covering the Roles in Load Curtailment in Version 5 of the Functional Model Technical Document; “For non-voluntary curtailment, such as automatic underfrequency and undervoltage load shedding and manual load shedding, the Load-Serving Entity identifies which critical customer loads should be excluded from curtailment for public health, safety and/or security reasons.				
George R. Bartlett	Entergy Corporation	1	Negative	The following are the reasons associated with our Negative Ballot. Entergy reserves the right, after review of all the submitted ballots, to join with other balloters, whether positive or negative ballots, where any reasons included in their ballot that may be applicable to or otherwise impact Entergy as related to this ballot. All of the following Reasons are directed at the revisions applied to PRC-006-1. We agree with the EOP-003-1 revisions. **Response:** Thank you for your support. In M3 it is unclear what action is intended by the phrase “including the criteria itself”. Since the criteria is specified in R3, it is recommended that the phrase be deleted. **Response:** The SDT agrees with the commenter and removed the phrase from both M2 and M3. R5 and M5 should only apply to Planning Coordinators (PC) who are part of the joint island, while the way it is currently worded it appears to apply to every PC. We recommend the wording in M5 be changed to: “Each Planning Coordinator shall have dated evidence such as memorandums, letters, or other dated documentation that it reached concurrence with the other affected Planning Coordinators on design assessment results for any identified island in accordance with Requirement R5 and identifies the affected Planning Coordinators.” We also recommend that the wording in R5 be changed to: “Each Planning Coordinator shall reach concurrence with all other affected Planning Coordinators in UFLS design assessment results before design assessment completion for any island identified by that Planning Coordinator which include a portion of its footprint along with portions of another PC(s) footprint.” **Response:** The SDT understands the concern with requiring entities to reach concurrence. The SDT redrafted Requirement R5 and Requirement R13 to address this concern. The SDT’s proposal eliminates the need to reach concurrence and replaces it with clear required actions that demonstrate that the Planning Coordinators coordinated should an island cross Planning Coordinator areas. The SDT also made associated changes to the corresponding measures. The Lower VSL for R11 appears to simply repeat the requirement rather than stating a violation. **Response:** The SDT made conforming changes to the VSL for Requirement R11. We recommend that the time ranges for the VSLs addressing being late with the assessment should be expanded to Moderate - 12-14 months, High - 14-16 months, and Severe - greater than 16 months. **Response:** The SDT does not agree with the recommendation to add a range of time to
Joel T Plessinger	Entergy	3	Negative	

Voter	Entity	Segment	Vote	Comment
				the VSLs. The SDT established increments in the VSLs according to NERC's VSL guidelines. We also recommend that the High and Severe VSLs that contain the phrase "shall conduct and document" to read "conducted and documented". The VSLs for R4 should include a consideration of the timeliness of the completion of the study (e.g. Lower VSL for 3 months late, Moderate VSL for 3 to 6 months late, etc.) **Response:** The SDT accurately reflected the severity of not performing the study in the VSLs as proposed and does not agree that gradated the timeliness of the study is necessary. The standard R5 requires that both or all the Planning Coordinators agree. One PC might have larger margin requirements or a different methodology compared to another PC. These differences might not be reconcilable. We do not believe that a standard can require that one PC change its methods because a different PC does not agree with its methods, or agree that another method (any method) is acceptable that it finds a problem with. There at least needs to be a process in the event that two PCs cannot agree. We recommend that the following language be added to R5: "If concurrence cannot be reached, an individual Planning Coordinator in that island can demonstrate that its UFLS scheme meets the requirements by performing dynamic simulations that apply its UFLS scheme on the entire island." **Response:** The SDT understands the concern with requiring entities to reach concurrence. The SDT redrafted Requirement R5 and Requirement R13 to address this concern. The SDT's proposal eliminates the need to reach concurrence and replaces it with clear required actions that demonstrate that the Planning Coordinators coordinated should an island cross Planning Coordinator areas. The SDT also made associated changes to the corresponding measures. We recommend that R13 be eliminated since it is covered by R11. We recommend that R3 be revised to require the PC to specifically notify each of the "UFLS Entities" in their PC area that are part of the PC's UFLS program of the UFLS program. We are also concerned that the Planning Coordinator is responsible to develop a UFLS program that incorporates information from Generator Owners (R3-R3.3.3) but there is no requirement that Generator Owners provide this information. We are aware that PRC-024 (Project 2007-09) contains reporting requirements (R3, R4 and R5) but are not certain that the tables in PRC-024 match those in PRC-006 nor is there any guarantee that PRC-024 will be FERC approved without change. Therefore, we request that this standard be made applicable to GOs and those GOs provide the required information. The Unofficial Comment Form for this standard, in the Review of Technical Changes to Standard section contains the following statement "The SDT has added requirements to include an assessment of the performance of UFLS programs "within one year of an actuation of UFLS resulting in 500 MW or greater of loss of load."(Requirement R11)." However the

Voter	Entity	Segment	Vote	Comment
				500 MW limitation is not included in R11. We recommend this 500 MW limitation be added to R11. There is no need to evaluate smaller islanding events. **Response:** The responsibility of generator owners resides within a standard under development currently, PRC-024. Per the implementation schedule, any requirements that necessitate the use of generator tripping data do not come into effect until after PRC-024 is approved.
John Canavan	NorthWestern Energy	1	Negative	The primary concern identified is that the current proposal does not require coordination within the interconnection. The standard should require the PCs within an interconnection to coordinate a UFLS Design with all other PCs within the interconnection and that the PCs should be required to develop a coordinated interconnection wide UFLS Design. As proposed the standard could conceivably result in as many different UFLS plans within WECC as there are Planning Coordinators. **Response:** The SDT agrees that interconnection coordinated UFLS plans are desirable, but the degree of diversity of systems in various regions, particularly in the Eastern Interconnection, makes this an unrealistic goal for a continent-wide standard; some flexibility needs to be reserved to address regional needs. The SDT agrees that frequency is an interconnection issue, but also acknowledges that, should an island form, frequency becomes an island issue also. The SDT does not believe that designating islands as a secondary function of UFLS is a distinction useful for reliability because most UFLS operations are seen to occur following island formation. Additionally, the proposed standard fails to address UFLS relays which are currently part of the existing program which are owned by the customer. Recognition of customer owned relays is critical to have a successful program. To assure areas are covered the LSE needs to be included in the Applicability section. **Response:** Several commenters indicated that LSEs should be included in the applicability of the standard. The SDT recognizes that the Functional Model Version 5 and the Statement of Compliance Registry cause confusion regarding the involvement of the LSE in UFLS programs but the SDT refers to the section covering the Roles in Load Curtailment in Version 5 of the Functional Model Technical Document; “For non-voluntary curtailment, such as automatic underfrequency and undervoltage load shedding and manual load shedding, the Load-Serving Entity identifies which critical customer loads should be excluded from curtailment for public health, safety and/or security reasons.
Chifong L. Thomas	Pacific Gas and Electric Company	1	Negative	
John C. Collins	Platte River Power Authority	1	Negative	
Terry L Baker	Platte River Power Authority	3	Negative	
Glen Reeves	Salt River Project	5	Negative	

Voter	Entity	Segment	Vote	Comment
				A third concern is the proposed standard attempts to establish continent wide frequency-time curves and eliminate discrete set points. This approach fails to recognize the unique characteristics of the four individual interconnections. Frequency-time curves do not allow for specific and defined measurements and will leave individual entities defaulting to the lowest common denominator. If frequency-time curves are intended to define the boundaries, the determination of discrete set points would fall into the hands of the PCs leading to disagreements among entities. In addition, to determine the frequency-time curves through stability and dynamic modeling, one must establish discrete set points. Frequency-time curves are reverse engineering and require justification and correlation to the reliability of the interconnections - no such justification has been provided. **Response:** The SDT believes that there is confusion concerning the application of the curves. The goal of the UFLS is to control frequency during a UFLS event such that generation does not trip. Project 2007-09 Generator Verification for draft Standard PRC-024 is developing the curves to establish the over- and under-frequency protection for the generation, so, the UFLS SDT is trying to stay within those curves by some margin, e.g., between the two curves of Attachment 1 and 2. The SDT recognizes that some generators may not meet those curves and wants the PC to specifically model the trip settings of those generators. We understand that V/Hz is not a standard output, but, it should not be a large effort to monitor voltage and frequency, divide the two, and integrate over each time step. The SDT received many comments on prior versions of this standard to make sure PRC-006 was coordinated with PRC-024 as the two were being drafted. We are taking the direction of the majority of commenters.
Jerome Murray	Oregon Public Utility Commission	9	Negative	The primary concern is that the current proposal does not require coordination within the interconnection. The standard should require the Planning Coordinators (PCs) within an interconnection to coordinate a UFLS Design with all other PCs within the interconnection and that the PCs should be required to develop a coordinated interconnection wide UFLS Design. As proposed the standard could conceivably result in as many different UFLS plans within WECC as there are PCs. **Response:** The SDT agrees that interconnection coordinated UFLS plans are desirable, but the degree of diversity of systems in various regions, particularly in the Eastern Interconnection, makes this an unrealistic goal for a continent-wide standard; some flexibility needs to be reserved to address regional needs. The SDT agrees that frequency is an interconnection issue, but also acknowledges that, should an island form, frequency becomes an island issue also. The SDT does not believe that designating islands as a secondary function of UFLS is a distinction useful for reliability because most UFLS operations are seen to occur following island formation. Additionally, the proposed standard fails to address UFLS relays which are currently part of the existing program which are owned by the customer. Recognition of customer owned relays is critical to have a successful program. To assure areas are covered the LSE

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				needs to be included in the Applicability section. **Response:** Several commenters indicated that LSEs should be included in the applicability of the standard. The SDT recognizes that the Functional Model Version 5 and the Statement of Compliance Registry cause confusion regarding the involvement of the LSE in UFLS programs but the SDT refers to the section covering the Roles in Load Curtailment in Version 5 of the Functional Model Technical Document; "For non-voluntary curtailment, such as automatic underfrequency and undervoltage load shedding and manual load shedding, the Load-Serving Entity identifies which critical customer loads should be excluded from curtailment for public health, safety and/or security reasons. A third concern is the proposed standard attempts to establish continent wide frequency-time curves and eliminate discrete set points. This approach fails to recognize the unique characteristics of the four individual interconnections. Frequency-time curves do not allow for specific and defined measurements and will leave individual entities defaulting to the lowest common denominator. If frequency-time curves are intended to define the boundaries, the determination of discrete set points would fall into the hands of the PCs leading to disagreements among entities. In addition, to determine the frequency-time curves through stability and dynamic modeling, one must establish discrete set points. Frequency-time curves are reverse engineering and require justification and correlation to the reliability of the interconnections - no such justification has been provided. **Response:** The SDT believes that there is confusion concerning the application of the curves. The goal of the UFLS is to control frequency during a UFLS event such that generation does not trip. Project 2007-09 Generator Verification for draft Standard PRC-024 is developing the curves to establish the over- and under-frequency protection for the generation, so, the UFLS SDT is trying to stay within those curves by some margin, e.g., between the two curves of Attachment 1 and 2. The SDT recognizes that some generators may not meet those curves and wants the PC to specifically model the trip settings of those generators. We understand that V/Hz is not a standard output, but, it should not be a large effort to monitor voltage and frequency, divide the two, and integrate over each time step. The SDT received many comments on prior versions of this standard to make sure PRC-006 was coordinated with PRC-024 as the two were being drafted. We are taking the direction of the majority of commenters.

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Chad Bowman	Public Utility District No. 1 of Chelan County	1	Negative	The proposed standard attempts to establish continent wide frequency-time curves and eliminate discrete set points. This approach fails to recognize the unique characteristics of the individual interconnections. Frequency-time curves do not allow for specific and defined measurements and will leave individual entities defaulting to the lowest common denominator. If frequency-time curves are intended to define the boundaries, the determination of discrete set points would fall into the hands of the PCs leading to disagreements among entities. In addition, to determine the frequency-time curves through stability and dynamic modeling, one must establish discrete set points. Frequency-time curves are reverse engineering and require justification and correlation to the reliability of the interconnections - no such justification has been provided.
Response: The SDT believes that there is confusion concerning the application of the curves. The goal of the UFLS is to control frequency during a UFLS event such that generation does not trip. Project 2007-09 Generator Verification for draft Standard PRC-024 is developing the curves to establish the over- and under-frequency protection for the generation, so, the UFLS SDT is trying to stay within those curves by some margin, e.g., between the two curves of Attachment 1 and 2. The SDT recognizes that some generators may not meet those curves and wants the PC to specifically model the trip settings of those generators. We understand that V/Hz is not a standard output, but, it should not be a large effort to monitor voltage and frequency, divide the two, and integrate over each time step. The SDT received many comments on prior versions of this standard to make sure PRC-006 was coordinated with PRC-024 as the two were being drafted. We are taking the direction of the majority of commenters.				
Jerry W Johnson	South Mississippi Electric Power Association	5	Negative	The requirement seems to require the installation of facilities rather than just relays. 16 USC 824o (a)(3) gives NERC the authority to regulate existing facilities and planned additions or modifications to those facilities, not to prompt or require modifications or additions to the existing facilities. Criteria are never actually defined in the requirements. Planning Coordinator footprints are not established. What does “annually maintain” mean? Does it mean the Database requires annual updates, annual reviews or just to provide a database annually? Frequency excursions precede an islanding event. I.e. low frequency initiates UFLS which should prevent an unintentional islanding event. The wording of this requirement makes it seem like the islanding event occurs first and causes the UF. Measures are too vague, lacking specifics, and not performance-based. This would leave too much up to the Auditor’s interpretation. Measures are only valuable if they contain specific targets or specifications that clarify how an entity will be deemed to be compliant with the standard as written. Measures which merely repeat the standard with the inclusion of “shall have evidence such as...” are not very useful. Measures should be explicit, detailed, consistent, and provide useful guidance to entities. These measures do not provide any useful guidance beyond what is specified in the requirement itself. M3: It is unclear what action is intended by the phrase "including the criteria itself." Since the criteria is specified in R3, it is recommend that the phrase be deleted. M5 and R5: This should only apply to PCs who are a part of the joint island, while the way it is currently worded it appears to apply to every PC. The graphical representation of the

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				frequency-time curves alone allows plenty of margin for mis-interpretation of the curves data points. A "break-down" of the plotted curves should be clearly displayed (in conjunction with the graphical curve representation) in a table immediately below each frequency-time curve to further clarify the under- and over-frequency performance characteristic curves data points The standard lacks guidance as to what the trip settings should be. It is not clear as to how Attachment 1 should be used and doesn't provide specific detail for under frequency set points. Neighboring Planning Coordinators will be making requests and setting criteria for the local planning coordinators and associated UFLS entities. We do not agree with the text "any Planning Coordinator may now select islands including interconnected portions of the BES in adjacent Planning Coordinator footprints and Regional Entity footprints, without the need for coordinating." It is not clear what is included in automatic switching. This requirement is so vague that it does not appear to add anything in addition to the UFLS program design that it is intended to address. It appears that anything that R10 may be designed to address is already covered by R9.
Response: TPL standards require addition of facilities under certain conditions. This standard is not out of line. The SDT disagrees that the jurisdiction of Planning Coordinators and their footprints has not been established. Planning Coordinators must be able to identify the entities in their footprints in order to fulfill their coordination responsibilities. Annually maintain means annual updates, though not exclusively. UFLS cannot be expected to mitigate island formation. Most interconnections are large enough that a decline in frequency low enough to cause UFLS operations is highly unlikely unless the interconnection is broken into islands. Most UFLS operations are seen to occur following island formation. The SDT intends to add the performance characteristic curve data points. The under and over frequency performance curves are solely for checking dynamic simulations of UFLS program performance and should not be misunderstood as applying to UFLS relay set points. UFLS entities are not affected, nor will a Planning Coordinator need to make requests of them or set criteria for them as far as island identification is concerned. The SDT believes the quoted text is necessary due to the wide range of island determination criteria (R1) that may be forthcoming. "Automatic switching of Elements" refers to switching of, among other Elements, cap banks to prevent excessive voltages. R10 has been modified to remove the confusion.				
Gregory J Le Grave	Wisconsin Public Service Corp.	3	Negative	The Standard is not ready for implementation because portions of the draft are difficult to interpret due to vague language. R5 and R13 use the phrase "reach concurrence". In addition, it isn't clear if the UFLS entities must have the Planning Coordinator's UFLS program implemented by the standard's effective date.
Response: The SDT agrees that reaching concurrence could be problematic and has modified R5 and R13 to address this concern. UFLS Entities only need to comply with the Planning Coordinator's schedule for application.				

Voter	Entity	Segment	Vote	Comment
Robert D Smith	Arizona Public Service Co.	1	Negative	The standard is too prescriptive. It requires that islands be formed and the underfrequency load shedding be designed to arrest the frequency in the islands and meet several requirements. While this is a valid approach, it is a very restricted and prescriptive approach. The islands formed in the study may not be the islands which actually form when the events happen. The under frequency load shedding scheme should be considered as a safety net and the Planning Coordinator should be given more flexibility. Most of the standard requirements should be guidelines.
Thomas R. Glock	Arizona Public Service Co.	3	Negative	
Mel Jensen	APS	5	Negative	
Dennis Sismaet	Seattle City Light	6	Negative	The standard, requirements, and measurements should reflect the uniqueness of the individual interconnections and not common, continent wide prescriptions.
Response: A continent-wide standard can specify performance curves or it can specify UFLS design parameters; the SDT has opted for performance curves. This is the less restrictive approach of the two. The standard does not require island formation, only identification of islands to be the basis for UFLS assessments. The standard does not require Planning Coordinators to predict islands that may occur in the future; it only requires criteria for island identification in order for the design assessments in R4 to be conducted. UFLS needs to arrest system frequency declines, whether as islands or the interconnection. Guidelines have no place in an enforceable standard. A continent-wide standard must identify requirements that are common to the four interconnections and the SDT believes the standard does that without being unnecessarily prescriptive.				
Michelle Rheault	Manitoba Hydro	1	Negative	This standard is not ready for ballot. See submitted comments.
Mark Aikens	Manitoba Hydro	5	Negative	
Daniel Prowse	Manitoba Hydro	6	Negative	
Response: Please see SDT responses on comment form.				
Jonathan Appelbaum	United Illuminating Co.	1	Negative	UI is voting negative because we believe EOP-003 should apply to manual load shed and uvls. The term load shed is easy to use but can mistakenly be interpreted to inculde automatic underfrequency load shed. Please see our comment form for futher clarifiction
Response: The EOP-003 SAR has very limited scope which allows removal of UFLS from EOP-003 and nothing else. UVLS remains in EOP-003 and another SDT has been assigned to EOP-003. The SDT is making a few other changes to EOP-003.				
James R. Keller	Wisconsin Electric Power Marketing	3	Negative	We agree with the Measures as far as the draft standard is currently written, however, see our comments for questions 11, 12, and 13 that would require modifications to requirements R9 & R10 and to M9 & M10. We agree with the Violation Severity Levels as far as the draft standard is currently written, however, see our comments for questions 11, 12, and 13 that would require modifications to requirements R9 & R10 and the corresponding Violation Severity Levels. Although we agree that the Planning Coordinator has the wide-area view and technical

Voter	Entity	Segment	Vote	Comment
Anthony Jankowski	Wisconsin Energy Corp.	4	Negative	skills to oversee the design of and ensure the effectiveness of a UFLS program, we are concerned with how this concept will actually play out, especially when a UFLS Entity is within multiple Planning Coordinators' footprints. We agree with the expanded scope of the supplemental SAR, however, EOP-003-1 needs further revision to focus this standard solely on manual loadshed. References to the development of both UFLS and UVLS programs need to be removed from EOP-003-1 as PRC-006-1 will cover automatic UFLS programs and a series of other PRC standards already cover automatic UVLS programs. The SDT should delete R2, R4, R7 and M1 from the posted SDT revised draft standard EOP-003-1 as part of supplemental SAR limited scope of revising requirements related to underfrequency loadshedding. In addition, the SDT should give consideration to inserting the word "manual" in front of the words "load shedding" in R3 and R5 in the posted SDT revised draft standard EOP-003-1. The Measures and Violation Severity Level sections would need to be updated accordingly. Although we agree with the intent of the revisions, EOP-003-1 needs further revision to focus this standard solely on manual loadshed.
Linda Horn	Wisconsin Electric Power Co.	5	Negative	References to the development of both UFLS and UVLS programs need to be removed from EOP-003-1 as PRC-006-1 will cover automatic UFLS programs and a series of other PRC standards already cover automatic UVLS programs. The SDT should delete R2, R4, R7 and M1 from the posted SDT revised draft standard EOP-003-1 as part of supplemental SAR limited scope of revising requirements related to underfrequency loadshedding. In addition, the SDT should give consideration to inserting the word "manual" in front of the words "load shedding" in R3 and R5 in the posted SDT revised draft standard EOP-003-1. The Measures and Violation Severity Level sections would need to be updated accordingly. We agree with the concept of using the frequency time performance curves instead of discrete points. However, we would like the SDT to provide additional technical background on the methodology utilized to develop both the underfrequency and overfrequency time performance curves beyond what was discussed in the "Review of Technical Changes to Standard" section in the preface of the "Unofficial Comment Form." We agree with the concept of using the PRC-024 generator underfrequency and overfrequency tripping curves instead of discrete points. In addition, we agree with the generator size and connection threshold clarification. However, we continue to believe that this standard places a burden on the UFLS Entity to shed additional load to make up for generators which do not conform to the PRC-006/PRC-024 curves. For example, if an independent power producer did not conform

Voter	Entity	Segment	Vote	Comment
				with the PRC-006/PRC-024 curves, it places a burden on the UFLS Entity to potentially have to shed additional load, up to the generator's rating, to make up for the non-conforming independent generator. Although we agree with the revision, we disagree with carrying forward the legacy concept of using an entire Regional Entity's footprint as an island. It is highly unlikely that the entire Regional Entity footprint would become an island. What is the technical justification for the continuation of the legacy concept of studying islands consisting of the entire Regional Entity's footprint? In addition, similar to the concurrence that the Planning Coordinators need to reach in R5, concurrence needs to be reached between the Planning Coordinator(s) and the UFLS Entity on the UFLS program design and schedule for application. R9 needs to be revised as follows: "The Planning Coordinator(s) and each UFLS entity shall reach concurrence on the UFLS program design and schedule for application in each Planning Coordinator footprint in which the UFLS entity owns assets. Upon concurrence, each UFLS entity shall provide automatic tripping of Load in accordance with the UFLS program design and schedule for application determined by its Planning Coordinator(s) in each Planning Coordinator footprint in which it owns assets." Measurement M9 needs to be revised to include the concurrence. The Data Retention and Violation Severity Level sections need to be updated accordingly. Similar to the concurrence that the Planning Coordinators need to reach in R5, concurrence needs to be reached between the Planning Coordinator(s) and the Transmission Owner on the automatic switching of Elements in accordance with the UFLS program design and schedule for application. R10 needs to be revised as follows: "The Planning Coordinator(s) and each Transmission Owner shall reach concurrence on the automatic switching of Elements in accordance with the UFLS program design and schedule for application in each Planning Coordinator footprint in which the Transmission Owner owns transmission. Upon concurrence, each Transmission Owner shall provide automatic switching of Elements in accordance with the UFLS program and schedule for application determined by the Planning Coordinator(s) in each Planning Coordinator footprint in which it owns transmission." Measurement M10 needs to be revised to include the concurrence. The Data Retention and Violation Severity Level sections need to be updated accordingly. Although we agree with the intent of this requirement, similar to the concurrence that the Planning Coordinators need to reach in R5 & R13, concurrence needs to be reached between the Planning Coordinator(s) and the Transmission Owner on the automatic switching of Elements in accordance with the UFLS program design and schedule for application. R10 needs to be revised as follows: "The Planning Coordinator(s) and each Transmission Owner shall reach concurrence on the automatic switching of Elements in accordance with the UFLS program design and schedule for application in each Planning Coordinator

Voter	Entity	Segment	Vote	Comment
				footprint in which the Transmission Owner owns transmission. Upon concurrence, each Transmission Owner shall provide automatic switching of Elements in accordance with the UFLS program and schedule for application determined by the Planning Coordinator(s) in each Planning Coordinator footprint in which it owns transmission." Measurement M10 needs to be revised to include the concurrence. The Data Retention and Violation Severity Level sections need to be updated accordingly. Similar to the concurrence that the Planning Coordinators need to reach in R5 & R13, concurrence needs to be reached between the Planning Coordinator(s) and the UFLS Entity on the UFLS program design and schedule for application. R9 needs to be revised as follows: "The Planning Coordinator(s) and each UFLS entity shall reach concurrence on the UFLS program design and schedule for application in each Planning Coordinator footprint in which the UFLS entity owns assets. Upon concurrence, each UFLS entity shall provide automatic tripping of Load in accordance with the UFLS program design and schedule for application determined by its Planning Coordinator(s) in each Planning Coordinator footprint in which it owns assets." Measurement M9 needs to be revised to include the concurrence. The Data Retention and Violation Severity Level sections need to be updated accordingly. Although we agree with the intent of these requirements, the assessment required in R11 & R13 should only be completed for signif
Response: Please see SDT responses to questions 11, 12 and 13. The EOP-003 SAR has very limited scope which allows removal of UFLS from EOP-003 and nothing else. UVLS remains in EOP-003 and another SDT has been assigned to EOP-003. The SDT is making a few other changes to EOP-003. The over and under frequency versus time performance curves for UFLS were determined to coordinate with the Generator under and over frequency tripping curves (which have been also coordinated with the PRC-024 SDT) and to set a margin between the UFLS and generator curves. That is about all that can be said. The intent of Requirement R2, Part 2.3 is to attempt to preserve the present regional coordination of UFLS plans and designs. Requirement R2, Part 2.3 requires Regional Entity footprints to be identified as islands. Those islands are to be used in UFLS design assessments only, and the Planning Coordinators within each Regional Entity footprint must work with each other on the design assessments for those islands (R5). The SDT believes that this goes as far as practical to address the need to coordination UFLS plans within a region. (The SDT agrees that there is no technical reason for designating Regional Entity footprints as islands.) The SDT has addressed the matter of GO versus TO/DP obligation for non-conforming generators and has decided that, for the likely small amount of non-conforming generation, that it should be a small burden, if any, to be spread across multiple TO sand DPs. Several other commenters have expressed concern with use of the term "concurrence" and the SDT has modified R5 and R13 to address those concerns by removing "concurrence." The SDT agrees that UFLS Entities should have opportunity to provide input to the Planning Coordinator on what will be required of them. R14 has now been added to the standard and requires a peer review of a Planning Coordinator's design and schedule for implementation by the UFLS Entities. Hopefully, this addresses, at least in part, the commenter's suggestions. PRC-009, a FERC approved standard, does not have an event threshold, and PRC-006 is absorbing PRC-009.				
Jason L	Midwest ISO, Inc.	2	Negative	We are voting negative because: 1) EOP-003 is posted in this standards action and was

Voter	Entity	Segment	Vote	Comment
Marshall				just balloted last week in the Order 693 directives project. It is not clear how the differences will be resolved. 2) The PC needs frequency characteristics of generators to comply with the standard but the GOs have no obligation to supply them. 3) While conceptually dynamic simulation to test the UFLS schemes is a good idea, it may not be practical. Dynamic simulation of these UFLS schemes involves extreme contingency analysis which stretches the limits of the simulation tools. 4) There is an arbitrary requirement to split islands based on regions.
Response: The EOP-003 conflict has been resolved. PRC-024 is applicable to Generator Owners and has the requirement for them to supply generator under and over frequency trip settings to the Planning Coordinators. The implementation plan for PRC-006 recognizes that PRC-024 may be approved at a different time than PRC-006. Dynamic simulations of UFLS performance, including disturbances initiating island formation, have been done in the past and the SDT does not believe they are impractical. There are a number of assumptions that go into UFLS studies, however, and so these studies should be undertaken by experienced planners. The intent of Requirement R2, Part 2.3 is to attempt to preserve the present regional coordination of UFLS plans and designs. Requirement R2, Part R2.3 requires Regional Entity footprints to be identified as islands. Those islands are to be used in UFLS design assessments only, and the Planning Coordinators within each Regional Entity footprint must work with each other on the design assessments for those islands (R5). The SDT believes that this goes as far as practical to address the need to coordination UFLS plans within a region. (The SDT agrees that there is no technical reason for designating Regional Entity footprints as islands.)				
Janelle Marriott	Tri-State G & T Association Inc.	3	Negative	We believe that individual Planning Coordinators are not the appropriate entities to be responsible for determining criteria for areas that may form islands, for identifying the islands, for developing the UFLS program for periodic assessments, for maintaining databases or for assessing events. The current registration by numerous entities as Planning Coordinators does not lend itself to a comprehensive individual island formation methodology. All Planning Coordinators within an interconnection should be required to collaboratively develop an interconnection-coordinated UFLS Plan. Further, Planning Coordinator footprints are neither defined nor is there any guidance on how they should be established. Every VSL that refers to a PC footprint should be clarified. The primary purpose of any UFLS program should is to mitigate the need to form islands by balancing total system loads and resources. It is only a secondary function to balance the loads and resources after the islands have been formed. It appears the Drafting Team focused on the islanding events rather than assuring the interconnection integrity is maintained. Frequency is an interconnection issue not an individual island issue and therefore not driven by an individual PC but by a coordination of PCs efforts within the interconnection. We strongly believe that there should be recognized sub-area group(s), which consist of PCs, as assigned by the Regional Assurer (RA), which is the agent(s) for overall coordination within the interconnection or sub-area. For example in the WECC, the RA recognizes the following sub-area groups for UFLS coordination within the Interconnection: Southern Islanding Load Tripping, Northwest Power Pool UFLS Group and the WECC Off Nominal Frequency Load and Restoration Plan. Without the RA

Voter	Entity	Segment	Vote	Comment
				assuring coordination of the sub-area groups, PCs could randomly or arbitrarily form sub-area groups whose plans do not coordinate or address the interconnection reliability needs There is also a concern that EOP-003-2 is currently being balloted based on changes made as a part of the Order 693 Directives. The two versions are not compatible. We believe that "ownership" should be removed from the criteria because it may be different from the operating or controlling entity and both entities cannot be responsible. Load Serving Entities should also be included as a "possible" UFLS entity. Some large interruptible customers outside of DP or TO could be allowed to own UFLS devices. Each interconnection should establish discrete set points based upon stability and dynamic analysis. From discrete set points one can establish criteria which are measurable and performance based for the applicable entities. The existing analysis tools available are unable to model continuous time/frequency curves and therefore specific measurements for all entities cannot be defined leaving the performance at the discretion of the PC. Furthermore, the Standard needs to be very explicit that the curves are interconnection performance curves and not specific protective relay set points. The standard should adequately recognize the performance characteristics of different type of generation and a variance should not be required. Faster acting and greater inertia systems should be allowed the operating margins appropriate to their systems. Real differences exist between interconnections. The standard and its performance requirements should reflect this fact. This would allow for the uniqueness of each interconnection to be addressed similar to Hydro Quebec's variance.

Response: The SDT believes the Planning Coordinator, having a wide-area view and the necessary technical skills, is the proper entity to oversee the design and implementation of UFLS. There is also wide industry support for the Planning Coordinator as the proper entity for UFLS. The Reliability Assurer has a very limited scope of activity in the Functional Model and is not a user, owner or operator of the BES. The SDT recognizes the need to at least preserve coordination on the regional level and has inserted a requirement (Requirement R2, Part 2.3) to identify each Regional Entity footprint as an island to be assessed for UFLS performance. The PC's within each region will need to work with each other in order to produce a successful assessment.

The SDT disagrees that the jurisdiction of Planning Coordinators and their footprints has not been defined or established. Planning Coordinators must be able to identify the entities in their footprints in order to fulfill their coordination responsibilities.

The SDT agrees that interconnection coordinated UFLS plans are desirable, but the degree of diversity of systems in various regions, particularly in the Eastern Interconnection, makes this an unrealistic goal for a continent-wide standard; some flexibility needs to be reserved to address regional needs. The standard does not preclude development of Regional UFLS standards and that approach may address WECC's desire to have one coordinated UFLS design.

The SDT agrees that frequency is an interconnection issue, but also acknowledges that, should an island form, frequency becomes an island issue also. The SDT does not believe that designating islands as a secondary function of UFLS is a distinction useful for reliability because most UFLS operations are seen to occur following island formation, not while a system remains interconnected.

LSEs are not an appropriate entity to implement UFLS because they do not own UFLS relays or switching equipment

The under and over frequency performance curves are solely for checking dynamic simulations of UFLS program performance and should not be misunderstood as applying to UFLS relay set points. Analysis tools do not need to model the performance characteristic curves; the curves are used to check frequency trajectories only. The PC's UFLS program design must comply with these curves in simulated response so performance is not at the PC's

Voter	Entity	Segment	Vote	Comment
discretion. A continent-wide standard can specify performance curves or it can specify UFLS design parameters; the SDT has opted for performance curves. This is the less restrictive approach of the two.				
Kathleen Goodman	ISO New England, Inc.	2	Negative	We believe that the applicability section, which states: UFLS entities shall mean all entities that are responsible for the ownership, operation, or control of UFLS equipment as required by the UFLS program established by the Planning Coordinators. Such entities may include one or more of the following: 4.2.1 Transmission Owners 4.2.2 Distribution Providers Excludes inclusion of generators; however, R4 requires PCs to model generator specific information. This appears to be a missing link that needs to be addressed before the standard can be approved. Also, the standard is potentially in conflict with the work to be done on the Generator Verification Standard, which proposes to have Generator Performance During Frequency and Voltage Excursions contained in PRC-024. This would present yet another example of lack of coordination on NERC Standards development.
Response: PRC-024 is applicable to Generator Owners and has the requirement for them to supply generator under and over frequency trip settings to the Planning Coordinators. The implementation plan for PRC-006 recognizes that PRC-024 may be approved at a different time than PRC-006. The SDT has coordinated with the PRC-024 SDT so that both PRC-006 and PRC-024 are using the same under and over frequency generator tripping curves. Note that the situation of data required by another standard exists elsewhere; for example, TPL standards compliance requires data from MOD standards.				
Kenneth Goldsmith	Alliant Energy Corp. Services, Inc.	4	Negative	We disagree with the inclusion of the curves at the end of the standard - Attachment 1. The curves may not be realistic depending on the topology of the BES in any particular area.
Response: The SDT acknowledges that UFLS programs shedding more than 25-30 percent of load may need to apply different UFLS performance characteristic curves, but these curves are realistic up to at least 25 percent of load. The SDT does not believe topology to be a relevant factor, except that topology may lead to the need to arm larger amounts of UFLS.				
Paul Rocha	CenterPoint Energy	1	Negative	With regards to the proposed PRC-006-1; CenterPoint Energy is concerned about the overly prescriptive nature of this proposal and cannot support it in its present form. In particular, a requirement to identify areas that “may Island” might, arguably, make sense for a large interconnection such as the eastern or western interconnect, but it makes no sense for a smaller interconnect such as ERCOT that, essentially, is already an island for the purposes of this standard. Even for the larger interconnections, there are limitless possibilities of potential “islands” that could occur given certain combinations of contingencies. Since it is impractical to identify every conceivable island, it is unclear what level of diligence and documentation would be required to demonstrate to an auditor’s satisfaction that the responsible entity has reasonably identified areas that “may” island. This ambiguity and subjectivity is contrary to objective number 2 in the Project Background to develop a standard “with clearly defined requirements and unambiguous language”.

Voter	Entity	Segment	Vote	Comment
Response: All that is required concerning island identification (R1, R2) is to devise some criteria considering historical events and system studies and use those criteria to identify some islands. This does not mean that every conceivable island must be identified. The criteria can be as simple or elaborate as a Planning Coordinator desires. The SDT does not believe this is overly prescriptive, nor does it believe that it is ambiguous. However, island identification is admittedly subjective and it is difficult to offer more specific guidance in the standard without limiting adaptability.				
Michael Ibold	Xcel Energy, Inc.	3	Negative	Xcel Energy believes that the standard still contains many issues that are not clear and need to be resolved. Among these issues is the mapping of PC to subordinate entities in areas where a regional entity or RTO has not taken on the PC role. Also, there are concerns around how small generators (less than the threshold specified) are addressed. Detailed comments were submitted to NERC with the concurrent comment period.
Response: Please see SDT response to these comments on the comment form. The SDT disagrees that the mapping of Planning Coordinators to subordinate entities is a significant issue. Planning Coordinators must be able to identify the entities in their footprints in order to fulfill their coordination responsibilities. This standard does not apply to Generator Owners, but this SDT has coordinated on the development of PRC-024 with that SDT. Although this has long been a subject of debate, the SDT generally believes that generators smaller than the Statement of Compliance Registry thresholds can be omitted without significantly compromising reliability. GOs below the threshold could be registered if necessary for reliability according to the Compliance Registry Criteria.				
Liam Noailles	Xcel Energy, Inc.	5	Negative	Xcel Energy believes that the standard still contains many issues that are not clear and need to resolved. Among these issues is the mapping of PC to subordinate entities in areas where a regional entity or RTO has not taken on the PC role. Also, there are concerns around how small generators (less than the threshold specified) are addressed. Detailed comments were submitted to NERC with the concurrent comment period.
David F. Lemmons	Xcel Energy, Inc.	6	Negative	
Response: Please see SDT response to these comments on the comment form. The SDT disagrees that the mapping of Planning Coordinators to subordinate entities is a significant issue. Planning Coordinators must be able to identify the entities in their footprints in order to fulfill their coordination responsibilities. This standard does not apply to Generator Owners, but this SDT has coordinated on the development of PRC-024 with that SDT. Although this has long been a subject of debate, the SDT generally believes that generators smaller than the Statement of Compliance Registry thresholds can be omitted without significantly compromising reliability. GOs below the threshold could be registered if necessary for reliability according to the Compliance Registry Criteria.				
Gregory L Pieper	Xcel Energy, Inc.	1	Negative	Xcel Energy believes the standard still contains many aspects that are not clearly understood by entities, including what is needed to demonstrate a compliant PSMP. Comments have been submitted concurrently to NERC via the draft comment response form.
Response: Please see SDT response to these comments on the comment form.				
Edward P. Cox	AEP Marketing	6	Affirmative	AEP has provided some general comments to the last posting.

Voter	Entity	Segment	Vote	Comment
Response: Please see SDT response to these comments on the comment form.				
David H. Boguslawski	Northeast Utilities	1	Affirmative	Applicability of the standard, as proposed, excludes inclusion of generators; however, R4 requires PCs to model generator specific information. This represents a missing link that needs to be addressed before the standard can be approved. Also, the standard is potentially in conflict with the work being done on the Generator Verification Standard, which proposes to have Generator Performance during Frequency and Voltage Excursions contained in PRC-024. Sufficient coordination on NERC Standards development needs to occur on a going forward basis.
Response: PRC-024 is applicable to Generator Owners and has the requirement for them to supply generator under and over frequency trip settings to the Planning Coordinators. The implementation plan for PRC-006 recognizes that PRC-024 may be approved at a different time than PRC-006. The SDT has coordinated with the PRC-024 SDT so that both PRC-006 and PRC-024 are using the same under and over frequency generator tripping curves. Note that the situation of data required by another standard exists elsewhere; for example, TPL standards compliance requires data from MOD standards.				
Guy V. Zito	Northeast Power Coordinating Council, Inc.	10	Affirmative	Applicability of the standard, as proposed, excludes inclusion of generators; however, R4 requires PCs to model generator specific information. This represents a missing link that needs to be addressed before the standard can be approved. This standard seems to be contrary to FERC's stated concern with NPCC(Oct. 2009 Washington DC meeting) to develop a standard that can support the program it was designed to enforce.....the applicability as stated in the standard and by NERC registry criteria restricts and excludes the need for GO's that may in aggregate be necessary for a reliable UFLS program, to adhere to the standard. The standard also is potentially in conflict with the work being done on the Generator Verification Standard, which proposes to have Generator Performance During Frequency and Voltage Excursions contained in PRC-024. Sufficient coordination on NERC Standards development needs to occur on a going forward basis.
Response: PRC-024 is applicable to Generator Owners and has the requirement for them to supply generator under and over frequency trip settings to the Planning Coordinators. The implementation plan for PRC-006 recognizes that PRC-024 may be approved at a different time than PRC-006. The SDT has coordinated with the PRC-024 SDT so that both PRC-006 and PRC-024 are using the same under and over frequency generator tripping curves. Note that the situation of data required by another standard exists elsewhere; for example, TPL standards compliance requires data from MOD standards.				
Saurabh Saksena	National Grid	1	Affirmative	At present, the proposed implementation plan language describes a one year phase-in period for compliance that is intended to provide the Planning Coordinators with

Voter	Entity	Segment	Vote	Comment
Michael Schiavone	Niagara Mohawk (National Grid Company)	3	Affirmative	sufficient time to (i) develop and/or modify UFLS programs; and, (ii) to establish an implementation plan for all required equipment changes. It must be recognized that any implementation plan would probably cover a multi-year period reflecting the time required to perform the engineering, purchasing, installation, and testing phases associated with implementing new and/or modified UFLS schemes. As an example, NPCC has already implemented a Region specific UFLS Program incorporating a six year UFLS implementation plan, with year one of the plan having ended June, 2010. As such, NPCC is concerned with how the final language included in the NERC UFLS implementation plan might impact the NPCC-specific UFLS Implementation Program. NPCC will closely monitor NERC's efforts in developing its UFLS Reliability Standard so NPCC can appropriately include the continued implementation of its Region specific UFLS Program within the NPCC Regional Standard PRC-006-NPCC-1, the required Regional Entity companion standard to the NERC UFLS Standard.
Response: The SDT believes that NPCC's six-year implementation plan will not be adversely affected by this standard or this standard's implementation plan.				
Amir Y Hammad	Constellation Power Source Generation, Inc.	5	Affirmative	Constellation Power Generation is voting affirmative in this ballot, however, there are still some issues with this project. Primarily, R10 appears to provide BWRs with some relief regarding compliance with the more restrictive UF trip setpoints; however, R7 and R8 are still applicable to them too. I think an auditor could look at R7 and R8 in isolation and say that BWRs may be in violation of those requirements. A potential fix may be to add the following text to R7 and R8 - "[S]ubject to the exceptions and provisions set forth in R10, ..." Another concern is that the title for Figure 1 lists R8, yet the figure applies to R7, R8, R9, and R10. Constellation Power Generation suggests adding the other relevant requirement #s.
Response: The SDT suspects the commenter's comments apply to a different standard.				
Thomas W. Richards	Fort Pierce Utilities Authority	4	Affirmative	Please consider clarifying R10. It's a bit unclear wheather this is pertaining to the switching of capacitor banks to prevent an overvoltage condition.
Response: Yes, "automatic switching of Elements" refers to switching of, among other Elements, cap banks. R10 has been modified to remove the confusion.				

Voter	Entity	Segment	Vote	Comment
Charles H Yeung	Southwest Power Pool	2	Affirmative	SPP votes in favor of the standard but directs the SDT to the ISO RTO Council comments submitted on the PRC-006 standards. We are concerned the generator owner/operators are not included as applicabile registered entities to this standard but understand there is a separate effort to develop generator owner/operator standards that could require them to provide UFLS data to Planning Coordinators. Absent that enforceable requirement, PCs could be subject to inappropriate violations if a GO fails to provide needed UFLS data. In order to move new standards forward that rely on other yet to be approved standards, NERC must take a sensible approach in enforcement of requirements if a violation is found to be caused by gaps in enforceable standards as mentioned.
Response: PRC-024 is applicable to Generator Owners and has the requirement for them to supply generator under and over frequency trip settings to the Planning Coordinators. The implementation plan for PRC-006 recognizes that PRC-024 may be approved at a different time than PRC-006.				
Steven Grego	MEAG Power	3	Affirmative	The reference to "automatic switching of Elements" needs to be clarified. Does it mean that the TO needs to switch capacitor banks, or does it refer to the breakers equipped with UF relays? If it is referring to capacitor banks, is this applicable near major generation busses?
Steven M. Jackson	Municipal Electric Authority of Georgia	3	Affirmative	
Response: Yes, “automatic switching of Elements” refers to switching of, among other Elements, cap banks. R10 has been modified to remove the confusion.				
Larry E Watt	Lakeland Electric	1	Affirmative	This standard requires regional (collaborative) effort, however; it does not assign regional responsibility.
Response: Requirements cannot be assigned to Regional Entities and enforced the same way as other requirements because Regional Entities are not users, owners or operators of the BES. The SDT believes that, and the industry widely supports, the Planning Coordinator is the best entity.				
Jeff Nelson	Springfield Utility Board	3	Abstain	SUB provided some responses on the Comment Form.
Response: See SDT responses on comment form.				