

Reliability Standard Audit Worksheet¹

PRC-006-NPCC-01 - Automatic Underfrequency Load Shedding

This section to be completed by the Compliance Enforcement Authority.

Audit ID: Audit ID if available; or REG-NCRnnnnn-YYYYMMDD
Registered Entity: Registered name of entity being audited
NCR Number: NCRnnnnn
Compliance Enforcement Authority: NPCC
Compliance Assessment Date(s)²: Month DD, YYYY, to Month DD, YYYY
Compliance Monitoring Method: [On-site Audit | Off-site Audit | Spot Check]
Names of Auditors: Supplied by CEA

Applicability of Requirements

	BA	DP	GO	GOP	IA	LSE	PA	PSE	RC	RP	RSG	TO	TOP	TP	TSP
R1							X								
R2							X								
R3							X								
R4		X										X			
R5		X										X			
R6		X										X			
R7		X										X			
R8							X								
R9							X								
R10		X										X			
R11		X										X			
R12		X										X			
R13			X												
R14			X												

¹ NERC developed this Reliability Standard Audit Worksheet (RSAW) language in order to facilitate NERC's and the Regional Entities' assessment of a registered entity's compliance with this Reliability Standard. The NERC RSAW language is written to specific versions of each NERC Reliability Standard. Entities using this RSAW should choose the version of the RSAW applicable to the Reliability Standard being assessed. While the information included in this RSAW provides some of the methodology that NERC has elected to use to assess compliance with the requirements of the Reliability Standard, this document should not be treated as a substitute for the Reliability Standard or viewed as additional Reliability Standard requirements. In all cases, the Regional Entity should rely on the language contained in the Reliability Standard itself, and not on the language contained in this RSAW, to determine compliance with the Reliability Standard. NERC's Reliability Standards can be found on NERC's website. Additionally, NERC Reliability Standards are updated frequently, and this RSAW may not necessarily be updated with the same frequency. Therefore, it is imperative that entities treat this RSAW as a reference document only, and not as a substitute or replacement for the Reliability Standard. It is the responsibility of the registered entity to verify its compliance with the latest approved version of the Reliability Standards, by the applicable governmental authority, relevant to its registration status.

The NERC RSAW language contained within this document provides a non-exclusive list, for informational purposes only, of examples of the types of evidence a registered entity may produce or may be asked to produce to demonstrate compliance with the Reliability Standard. A registered entity's adherence to the examples contained within this RSAW does not necessarily constitute compliance with the applicable Reliability Standard, and NERC and the Regional Entity using this RSAW reserves the right to request additional evidence from the registered entity that is not included in this RSAW. Additionally, this RSAW includes excerpts from FERC Orders and other regulatory references. The FERC Order cites are provided for ease of reference only, and this document does not necessarily include all applicable Order provisions. In the event of a discrepancy between FERC Orders, and the language included in this document, FERC Orders shall prevail.

² Compliance Assessment Date(s): The date(s) the actual compliance assessment (on-site audit, off-site spot check, etc.) occurs.

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	BA	DP	GO	GOP	IA	LSE	PA	PSE	RC	RP	RSG	TO	TOP	TP	TSP
R15			X												
R16			X												
R17							X								
R18		X	X									X			
R19			X												
R20							X								
R21							X								
R22		X	X									X			
R23		X	X									X			

Legend:

Text with blue background:	Fixed text – do not edit
Text entry area with Green background:	Entity-supplied information
Text entry area with white background:	Auditor-supplied information

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(This section to be completed by the Compliance Enforcement Authority)

Req.	Finding	Summary and Documentation	Functions Monitored
R1			
R2			
R3			
R4			
R5			
R6			
R7			
R8			
R9			
R10			
R11			
R12			
R13			
R15			
R16			
R17			
R18			
R19			
R20			
R21			
R22			
R23			

Req.	Areas of Concern

Req.	Recommendations

Req.	Positive Observations

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Identify the Subject Matter Expert(s) responsible for this Reliability Standard.

Registered Entity Response **(Required; Insert additional rows if needed):**

Su	SME Name	Title	Organization	Requirement(s)

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R1. Each Planning Coordinator shall establish requirements for entities aggregating their UFLS programs for each anticipated island and requirements for compensatory load shedding based on islanding criteria (required by the NERC PRC Standard on UFLS). [Violation Risk Factor: Medium] [Time Horizon: Long Term Planning]

M1 ~~R1 Supporting Evidence and Documentation~~ Each Planning Coordinator shall have evidence such as reports, system studies and/or real time power flow data captured from actual system events and other dated documentation that demonstrates it meets Requirement R1.

Registered Entity Response (Required):

Compliance Narrative:

Provide a brief explanation, in your own words, of how you comply with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

File Name	Document Title	Revision or Version	Document Date	Relevant Page(s) or Section(s)	Description of Applicability of Document

Audit Team Evidence Reviewed (This section to be completed by the Compliance Enforcement Authority):

Compliance Assessment Approach Specific to PRC-006-NPCC-01, R1

This section to be completed by the Compliance Enforcement Authority

Review the evidence to verify the Registered Entity has:	
	Evidence such as reports, system studies and/or real time power flow data captured from actual system events and other dated documentation that demonstrates it meets Requirement R1, such as:
	PRC-006-1; R1. - Each Planning Coordinator shall develop and document criteria, including consideration of historical events and system studies, to select portions of the Bulk Electric System (BES), including interconnected portions of the BES in adjacent Planning Coordinator areas and Regional Entity areas that may form islands.
	PRC-006-1; R2 - Each Planning Coordinator shall identify one or more islands to serve as a basis for designing its UFLS program including:

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	2.1. Those islands selected by applying the criteria in Requirement R1, and
	2.2. Any portions of the BES designed to detach from the Interconnection (planned islands) as a result of the operation of a relay scheme or Special Protection System, and
	2.3. A single island that includes all portions of the BES in either the Regional Entity area 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. Planning Coordinators may adjust island boundaries to differ from Regional Entity area boundaries by mutual consent where necessary for the sole purpose of producing contiguous regional islands more suitable for simulation.
	A policy or procedure that specifies the requirements set by the Planning Coordinator for entities wishing to aggregate their UFLS programs and the requirements for Generator Owners to provide compensatory load shedding within an island based on the islanding criteria derived from each Planning Coordinator's system studies and in accordance with NERC Reliability Standard PRC-006-1; R1 and R2.
Note to Auditor: The NPCC Regional Standard has an Implementation Plan embedded in the Standard that differs based on the location of the entities. Further not all requirements are enforceable on the same date.	

Auditor Notes:

R2 Supporting Evidence and Documentation

R2. Each Planning Coordinator shall, within 30 days of completion of its system studies required by the NERC PRC Standard on UFLS, identify to the Regional Entity the generation facilities within its Planning Coordinator Area necessary to support the UFLS program performance characteristics. [Violation Risk Factor: Medium] [Time Horizon: Long Term Planning]

M2. Each Planning Coordinator shall have evidence such as dated documentation that demonstrates that it meets requirement R2.

Registered Entity Response (Required):

Compliance Narrative:

Provide a brief explanation, in your own words, of how you comply with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

Registered Entity Evidence (Required):

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Audit Team Evidence Reviewed *(This section to be completed by the Compliance Enforcement Authority):*

Compliance Assessment Approach Specific to PRC-006-NPCC-01, R2

This section to be completed by the Compliance Enforcement Authority

Review the evidence to verify the Registered Entity has:	
	Evidence such as dated documentation that demonstrates that it meets requirement such as:
	Studies performed by the Planning Coordinator, or under the direction of an NPCC Task Force, that identifies the generator MVA or MW threshold for applicability within the Planning Coordinator's Area, or on an island basis, such that the UFLS Program remains viable when generators below that threshold are not required to meet the applicable requirements of this Standard.
	Based on the threshold(s) established, the Planning Coordinator shall identify all generators, by name and owner, that are required to meet any or all of the applicable provisions stated in R13 through R16 and R18-R19, as necessary, to support the UFLS program performance.
	Written, dated, correspondence indicating that the Planning Coordinator provided the names of those impactive generation facilities to its Regional Entity within 30 days of completion of its system studies.

Note to Auditor: Each Planning Coordinator will be responsible, under R2, to identify the generation facilities within their Planning Coordinator Area that are necessary to support the UFLS performance characteristics. R2 limits the number of generators and any predetermined size to PC studies. These studies may show that different generator MVA thresholds are necessary to support individual island analyses. Some sub-regions within NPCC may find that generators of >20 MVA are required to comply with this standard while other regions may find that a lower threshold is necessary. Thus the identified list of generators is dependent on each of the sub-regions' analyses. Following the identification of these impactive generators, the Regional Entity will declare these generators material under section III.c.4 of the NERC Registry Criteria document. Generators so identified would need to register with NERC and, as a minimum, meet the applicable requirements contained within PRC-006-NPCC-1.

Auditor Notes:

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- R3. Each Planning Coordinator shall provide to the Transmission Owner, Distribution Provider, and Generator Owner within 30 days upon written request the requirements for entities aggregating the UFLS programs and requirements for compensatory load shedding program derived from each Planning Coordinator's system studies as determined by Requirement R1. [Violation Risk Factor: Low] [Time Horizon: Long Term Planning]

R3 Supporting Evidence and Documentation

- M3. Each Planning Coordinator shall have evidence such as dated documentation that demonstrates that it meets Requirement R3.

Registered Entity Response (Required):

Compliance Narrative:

Provide a brief explanation, in your own words, of how you comply with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

Registered Entity Evidence (Required):

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Audit Team Evidence Reviewed (This section to be completed by the Compliance Enforcement Authority):

Compliance Assessment Approach Specific to PRC-006-NPCC-01, R3

This section to be completed by the Compliance Enforcement Authority

Review the evidence to verify the Registered Entity has:	
	Received a written request by one or more Transmission Owners or Distribution Providers to obtain the Planning Coordinator's requirements to be met in order for the requesting entities to aggregate their UFLS programs within an island as determined by Requirement R1.
	Received a written request by a Generator Owner, Transmission Owner and/or Distribution Provider requesting the requirements for participating in a compensatory load shedding program as determined by Requirement R1.

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For all requests to the Planning Coordinator to provide either the requirements relative to UFLS aggregation or the requirements relative to compensatory load shedding programs, determine, by reviewing dated correspondence, that the Planning Coordinator responded to such requests within 30 days of receipt and provided the applicable requirements in each case. The response by the Planning Coordinator shall include the identification of the island identified in accordance with Requirement R1 of this standard that is applicable to the specific entity (ies) involved and the nature of their request.

Note to Auditor: Aggregated Automatic UFLS Program: Per requirement R4 entities may collectively implement an aggregated automatic UFLS program within the same island as may be identified in accordance with Requirement R1. Requirement R3 requires the Planning Coordinator, having jurisdiction in each case, to identify the island that defines a physical and/or electrical boundary to be used for designing and implementing the aggregated automatic UFLS scheme.

Compensatory Load Shedding Criteria: Refer to PRC-006-NPCC-1 Attachment A for Compensatory Load Shedding Criteria for Ontario, Quebec, and the Maritime Provinces or to Attachment B for Compensatory Load Shedding Criteria for Compensatory Load Shedding Criteria for ISO-NE and NYISO.

Attachment A: Within Ontario, Quebec and the Maritime provinces the Planning Coordinator is responsible for establishing the compensatory load shedding requirements for all existing non-nuclear units in its NPCC area with underfrequency protections set to trip above the appropriate curve in Figure 1. In addition, it is the Planning Coordinator's responsibility to communicate these requirements to the appropriate Distribution Provider or Transmission Owner and to ensure that adequate compensatory load shedding is provided in all islands identified in Requirement R1 in which the unit may operate. Auditors should use Attachment A as a template to judge compliance with requirement R3.

Attachment B: The Generator Owner in the New England states or New York State are responsible for establishing a compensatory load shedding program for all existing non-nuclear units with underfrequency protection set to trip above the appropriate curve in Figure 1 of this standard. The Generator Owner shall follow the methodology outlined in Attachment B to determine compensatory load shedding requirements. The Generator Owner, and in some cases the Distribution Provider and/or Transmission Owner providing the physical compensatory load shedding capability, shall contact the Planning Coordinator to obtain the appropriate island information as identified by application of Requirement 1.

Auditor Notes:

R4 Supporting Evidence and Documentation

R4. Each Distribution Provider and Transmission Owner in the Eastern Interconnection portion of NPCC shall implement an automatic UFLS program reflecting normal operating conditions excluding outages for its Facilities based on frequency thresholds, total nominal operating time and amounts specified in Attachment

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C, Tables 1 through 3, or shall collectively implement by mutual agreement with one or more Distribution Providers and Transmission Owners within the same island identified in Requirement R1 and acting as a single entity, provide an aggregated automatic UFLS program that sheds their coincident peak aggregated net Load, based on frequency thresholds, total nominal operating time and amounts specified in Attachment C, Tables 1 through 3. [Violation Risk Factor: High] [Time Horizon: Long Term Planning]

- M4. Each Distribution Provider and Transmission Owner in the Eastern Interconnection portion of NPCC shall have evidence such as documentation or reports containing the location and amount of load to be tripped, and the corresponding frequency thresholds, on those circuits included in its UFLS program to achieve the individual and cumulative percentages identified in Requirement R4. (Attachment C Tables 1-3).

Question: Are you a Distribution Provider or Transmission Owner in the Eastern Interconnection portion of NPCC? ☐ Yes ☐ No

If Yes, complete the entries for R4.

Registered Entity Response (Required):

Compliance Narrative:

Provide a brief explanation, in your own words, of how you comply with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

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Audit Team Evidence Reviewed (This section to be completed by the Compliance Enforcement Authority):

Compliance Assessment Approach Specific to PRC-006-NPCC-01, R4

This section to be completed by the Compliance Enforcement Authority

Review the evidence to verify the Registered Entity has:	
	Provided evidence that its peak net load is either 100 MW or more, 50 MW or more and less than 100 MW or 25 MW or more and less than 50 MW.
	Provided evidence that, based on its peak net load, it has implemented a UFLS program in accordance

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	with the attributes specified in Attachment C, Tables 1 through 3, as applicable; or;
	Has collectively implemented by mutual agreement with one or more Distribution Providers and Transmission Owners within the same island identified in Requirement R1 and acting as a single entity, provide an aggregated automatic UFLS program that sheds their coincident peak aggregated net Load, based on frequency thresholds, total nominal operating time and amounts specified in Attachment C, Tables 1 through 3, as applicable.
	Implemented frequency thresholds, total nominal operating times and load shedding quantities as specified in the appropriate Attachment C Table and has maintained the individual and cumulative tolerances relative to the percentages of load required to be shed at each stage of the frequency thresholds specified.

Note to Auditor:

UFLS Program Stages: The NPCC UFLS program characteristics as developed by the NPCC Working Group on Inter-Area Dynamic Analysis (SS-38) and implemented by NPCC Area Planning Coordinators is designed with five discrete stages of load shedding (including an anti-stall stage) with approximately 7% of load shedding at each of the program stages. However, many smaller entities (typically those with less than 100MW) are constrained by facility design but with the technical support of the NPCC SS-38 group the drafting team developed modified program stages and tolerances for these smaller entities. The NPCC SS-38 Working Group modeled these small entity parameters to ensure that the overall regional program converged using these attributes. Furthermore, these small entity characteristics have already been incorporated within the regional UFLS criteria and included in NPCC Directory#12 Underfrequency Load Shedding Program Requirements.

UFLS Program Stage Tolerances for Entities with 100 MW or more of Peak Net Load: In 2010 SS-38 completed its "Under-Frequency Load Shedding Support Study" that , in part, examined the tolerances that could be permitted when implementing the individual program stages of load shedding in 7% blocks. NPCC SS-38 recommended that the upper and lower program tolerances at each stage should be bounded by +/- 0.5% surrounding a nominal amount of load shed at each stage (7%). This recommendation was incorporated into the standard and provides entities designing their UFLS programs with some degree of flexibility when assigning the amount of load to be shed on declining frequency.

Verification and Validation: Verification and validation that that the entity has established frequency thresholds, total nominal operating times and load shedding quantities as specified in the appropriate Attachment C Table and has maintained the individual and cumulative tolerances relative to the percentages of load required to be shed at each stage of the frequency thresholds specified can be demonstrated, in part, by evaluating the evidence submitted in support of R12.

Auditor Notes:

R5 Supporting Evidence and Documentation

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- R5.** Each Distribution Provider or Transmission Owner that must arm its load to trip on underfrequency in order to meet its requirements as specified and by doing so exceeds the tolerances and/or deviates from the number of stages and frequency set points of the UFLS program as specified in the tables contained in Requirement R4 above, as applicable depending on its total peak net Load shall: [Violation Risk Factor: High] [Time Horizon: Long Term Planning]
- 5.1** Inform its Planning Coordinator of the need to exceed the stated tolerances or the number of stages as shown in UFLS Attachment C, Table 1 if applicable and
- 5.2** Provide its Planning Coordinator with a technical study that demonstrates that the Distribution Providers or Transmission Owners specific deviations from the requirements of UFLS Attachment C, Table 1 will not have a significant adverse impact on the bulk power system.
- 5.3** Inform its Planning Coordinator of the need to exceed the stated tolerances of UFLS Attachment C, Table 2 or Table 3, and in the case of Attachment C, Table 2 only, the need to deviate from providing two stages of UFLS, if applicable, and
- 5.4** Provide its Planning Coordinator with an analysis demonstrating that no alternative load shedding solution is available that would allow the Distribution Provider or Transmission Owner to comply with UFLS Attachment C Table 2 or Attachment C Table 3.
- M5.** Each Distribution Provider or Transmission Owner shall have evidence such as reports, analysis, system studies and dated documentation that demonstrates that it meets Requirement R5.

Registered Entity Response (Required):

Compliance Narrative:

Provide a brief explanation, in your own words, of how you comply with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

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Audit Team Evidence Reviewed (This section to be completed by the Compliance Enforcement Authority):

Compliance Assessment Approach Specific to PRC-006-NPCC-01, R5

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This section to be completed by the Compliance Enforcement Authority

Review the evidence to verify the Registered Entity has:	
	Provided evidence such as reports, analysis, system studies and dated documentation that demonstrates:
	The entity informed its Planning Coordinator of the need to exceed the stated tolerances and/or the number of stages as shown in UFLS Attachment C, Table 1 and provided its Planning Coordinator with a technical study that demonstrates that the entity's specific deviations from the requirements of UFLS Attachment C, Table 1 will not have a significant adverse impact on the bulk power system.
	Provided evidence such as reports, analysis, system studies and dated documentation that demonstrates:
	The entity informed its Planning Coordinator of the need to exceed the stated tolerances of UFLS Attachment C, Table 2 or Table 3, and in the case of Attachment C, Table 2 only, the need to deviate from providing two stages of UFLS, if applicable, and provided its Planning Coordinator with an analysis demonstrating that no alternative load shedding solution is available that would allow the entity to comply with UFLS Attachment C Table 2 or Attachment C Table 3.

Note to Auditor:

UFLS Program Stages: The NPCC UFLS program characteristics as developed by the NPCC Working Group on Inter-Area Dynamic Analysis (SS-38) and implemented by NPCC Area Planning Coordinators is designed with five discrete stages of load shedding (including an anti-stall stage) with approximately 7% of load shedding at each of the program stages. However, many smaller entities (typically those with less than 100MW) are constrained by facility design but with the technical support of the NPCC SS-38 group the drafting team developed modified program stages and tolerances for these smaller entities. The NPCC SS-38 Working Group modeled these small entity parameters to ensure that the overall regional program converged using these attributes. Furthermore, these small entity characteristics have already been incorporated within the regional UFLS criteria and included in NPCC Directory#12 Underfrequency Load Shedding Program Requirements.

UFLS Program Stage Tolerances for Entities with 100 MW or more of Peak Net Load: In 2010 SS-38 completed its "Under-Frequency Load Shedding Support Study" that , in part, examined the tolerances that could be permitted when implementing the individual program stages of load shedding in 7% blocks. NPCC SS-38 recommended that the upper and lower program tolerances at each stage should be bounded by +/- 0.5% surrounding a nominal amount of load shed at each stage (7%). This recommendation was incorporated into the standard and provides entities designing their UFLS programs with some degree of flexibility when assigning the amount of load to be shed on declining frequency.

Verification and Validation: Verification and validation that that the entity has established frequency thresholds, total nominal operating times and load shedding quantities as specified in the appropriate Attachment C Table and has maintained the individual and cumulative tolerances relative to the percentages of load required to be shed at each stage of the frequency thresholds specified can be demonstrated, in part, by evaluating the evidence submitted in support of R12.

In the case of 5.1/5.2 it is assumed that large entities will demonstrate by technical studies to the

satisfaction of the PC that exceeding the tolerances specified does not have a significant adverse impact on the BES.

In the cases for the smaller entities (5.3/5.4) the deviations from the tolerances or number of stages does not require a technical study; however the entity must demonstrate to the PC's satisfaction that there are no alternative solutions available.

In any of the above cases the PC is understood to be responsible, if they accept the arguments made, to ensure its Area UFLS Program meets the required UFLS performance characteristics with these deviations in place.

Auditor Notes:

R6 Supporting Evidence and Documentation

- R6.** Each Distribution Provider and Transmission Owner in the Québec Interconnection portion of NPCC shall implement an automatic UFLS program for its Facilities based on the frequency thresholds, slopes, total nominal operating time and amounts specified in Attachment C, Table 4 or shall collectively implement by mutual agreement with one or more Distribution Providers and Transmission Owners within the same island, identified in Requirement R1, an aggregated automatic UFLS program that sheds Load based on the frequency thresholds, slopes, total nominal operating time and amounts specified in Attachment C, Table 4. [Violation Risk Factor: High] [Time Horizon: Long Term Planning]
- M6.** Each Distribution Provider and Transmission Owner in the Québec Interconnection shall have evidence such as documentation or reports containing the location and amount of load to be tripped and the corresponding frequency thresholds on those circuits included in its UFLS program to achieve the load values identified in Table 4 of Requirement R6. (Attachment C Table 4).

Question: Are you a Distribution Provider and Transmission Owner in the Québec Interconnection portion of NPCC? ☐ Yes ☐ No

If Yes, complete the entries for R6.

Registered Entity Response (Required):

Compliance Narrative:

Provide a brief explanation, in your own words, of how you comply with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

Registered Entity Evidence (Required):

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Audit Team Evidence Reviewed *(This section to be completed by the Compliance Enforcement Authority):*

Compliance Assessment Approach Specific to PRC-006-NPCC-01, R6

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Review the evidence to verify the Registered Entity has:	
	Provided evidence that it has implemented a UFLS program in accordance with the attributes specified in Attachment C, Tables 4, or;
	Has collectively implemented by mutual agreement with one or more Distribution Providers and Transmission Owners within the same island identified in Requirement R1, an aggregated automatic UFLS program that sheds Load based on the applicable slopes, frequency thresholds, total nominal operating times and amounts specified in Attachment C, Table 4.
	Implemented slope stage rates, frequency thresholds, load shedding quantiles (MW and Mvar) and total nominal operating times as specified in Attachment C, Table 4. (Note: The asterisked MW are the MW that must be shed regardless of the system load provided that the system load is greater than 60% of the peak load. Therefore, in these cases, the entity must demonstrate the respective load shedding quantities for all system loads between 60% and 100% of peak system load.)

Note to Auditor:

UFLS Parameters for the Québec Interconnection Portion of NPCC: The NPCC UFLS program characteristics developed for use within the Québec Interconnection are designed with five stages of load shedding at discrete frequencies (including an anti-stall stage) and four slope stages using both discrete rate of change values and discrete frequencies.

The five Threshold Stages include two stages (Threshold Stages 1 and 2) where the discrete amount of MW to be shed is fixed, independent of the system peak load, in all cases where the actual load is greater than 60% of peak.

In addition, the five Threshold Stages provide for MVARS to be shed at discrete frequencies tied to the peak load.

The Québec Interconnection has established four Slope Stages as part of its UFLS scheme. For Slope Stage 2

and Slope Stage 3 the discrete amount of MW to be shed is fixed, independent of the system peak load, in all cases where the actual load is greater than 60% of peak.

In addition the four Slope Stages provide for MVARs to be shed at discrete frequencies tied to the peak load.

In all four Slope Stages the load shed is triggered by four discrete slopes (rate of change of declining frequency values) while passing through a fixed frequency threshold.

Verification and Validation: Verification and validation that that the entity has established frequency thresholds, slope rates, total nominal operating times and load shedding quantities for MW and MVAR as specified in Attachment C, Table 4 can be demonstrated, in part, by evaluating the evidence submitted in support of R12.

Auditor Notes:

R7 Supporting Evidence and Documentation

R7. Each Distribution Provider and Transmission Owner shall set each underfrequency relay that is part of its region's UFLS program with the following minimum time delay:

7.1 Eastern Interconnection – 100 ms

7.2 Québec Interconnection – 200 ms

[Violation Risk Factor: High] [Time Horizon: Long Term Planning]

M7. Each Distribution Provider and Transmission Owner shall have evidence such as documentation or reports that their underfrequency relays have been set with the minimum time delay, in accordance with Requirement R7.

Registered Entity Response (Required):

Compliance Narrative:

Provide a brief explanation, in your own words, of how you comply with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

Registered Entity Evidence (Required):

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Compliance Assessment Approach Specific to PRC-006-NPCC-01, R7

This section to be completed by the Compliance Enforcement Authority

Review the evidence to verify the Registered Entity has:	
	Provided evidence that their underfrequency relays have been set with the minimum time delay specified by R7.1. or R7.2., as applicable.

Note to Auditor:

Total Nominal Operating Time: The total nominal operating time includes the underfrequency relay operating time plus any interposing auxiliary relay operating times, communications time, and the rated breaker interrupting time. The underfrequency relay operating time shall be measured from the time when the frequency passes through the frequency threshold set point.

Auditor Notes:

Supporting Evidence and Documentation

R8 Supporting Evidence and Documentation

- R8. Each Planning Coordinator shall develop and review once per calendar year settings for inhibit thresholds (such as but not limited to voltage, current and time) to be utilized within its region's UFLS program. [Violation Risk Factor: Medium] [Time Horizon: Long Term Planning]**

- M8. Each Planning Coordinator shall have evidence such as reports, system studies or analysis that demonstrates that it meets Requirement R8.**

Registered Entity Response (Required):

Compliance Narrative:

Provide a brief explanation, in your own words, of how you comply with this Requirement. Please describe the the type

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of inhibit setting (voltage, current, etc) utilized in the UFLS program. References to supplied evidence, including links to the appropriate page, are recommended.

Registered Entity Evidence (Required):

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Compliance Assessment Approach Specific to PRC-006-NPCC-01, R8

This section to be completed by the Compliance Enforcement Authority

Review the evidence to verify the Registered Entity has:	
	Evaluated the inhibit schemes in use within its Planning Coordinator Area to determine the physical characteristics of these schemes such as, but not limited to, voltage, current and time.
	Performed studies or analyses that established the required threshold values for each type of inhibit scheme identified for incorporation by each Distribution Provider and/or Transmission Owner that utilize inhibit schemes in their UFLS Program design.
	Reviewed its documentation supporting the establishment of the required inhibit schemes threshold values once per calendar year.

Note to Auditor:

Each Planning Coordinator shall have evidence such as reports, system studies or analysis that demonstrates that it meets Requirement R8.

In order to increase the security and selectivity of the underfrequency load shedding schemes, the underfrequency load shedding element is used in a scheme and may be supervised by a voltage, current, directional power or rate-of-frequency change element. The design of a load shedding protection scheme should be both dependable and secure to prevent unnecessary outages. Effects of voltage change on frequency load shedding should also be considered.

Inhibit settings may be required to avoid potential misoperation of the UFLS relay, specifically in the case where there is a voltage failure that affects the ability of the UFLS relay to measure voltage or the station is

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offloaded where UFLS exists.

Auditor Notes:

R9. Each Planning Coordinator shall provide each Transmission Owner and Distribution Provider within its Planning Coordinator area the applicable inhibit thresholds within 30 days of the initial determination of those inhibit thresholds and within 30 days of any changes to those thresholds. [Violation Risk Factor: Medium] [Time Horizon: Operations Planning]

R9 Supporting Evidence and Documentation

M9. Each Planning Coordinator shall provide evidence such as letters, emails, or other dated documentation that demonstrates that it meets Requirement R9.

Registered Entity Response (Required):

Compliance Narrative:

Provide a brief explanation, in your own words, of how you comply with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

File Name	Document Title	Revision or Version	Document Date	Relevant Page(s) or Section(s)	Description of Applicability of Document

Audit Team Evidence Reviewed (This section to be completed by the Compliance Enforcement Authority):

Compliance Assessment Approach Specific to PRC-006-NPCC-01, R9

This section to be completed by the Compliance Enforcement Authority

Review the evidence to verify the Registered Entity has:

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	Notified each Transmission Owner and Distribution Provider, that utilize a UFLS Program inhibit scheme, of the applicable inhibit thresholds to be incorporated and did so within 30 days of the initial determination of those inhibit thresholds.
	Notified each Transmission Owner and Distribution Provider, that utilize a UFLS Program inhibit scheme, of any changes to the applicable inhibit thresholds to be incorporated and did so within 30 days of the establishment of those threshold changes.
	Reviewed its documentation supporting the establishment of the required inhibit schemes threshold values once per calendar year.

Auditor Notes:

R10 Supporting Evidence and Documentation

R10. Each Distribution Provider and Transmission Owner shall implement the inhibit threshold settings based on the notification provided by the Planning Coordinator in accordance with Requirement R9. [Violation Risk Factor: High] [Time Horizon: Operations Planning]

M10. Each Distribution Provider and Transmission Owner shall provide evidence such as test reports, data sheets or other documentation that demonstrates that it meets

Requirement R10.

Registered Entity Response (Required):

Compliance Narrative:

Provide a brief explanation, in your own words, of how you comply with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

Registered Entity Evidence (Required):

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Audit Team Evidence Reviewed (This section to be completed by the Compliance Enforcement Authority):

Compliance Assessment Approach Specific to PRC-006-NPCC-01, R10

This section to be completed by the Compliance Enforcement Authority

Review the evidence to verify the Registered Entity has:	
	Incorporated inhibit threshold settings, as applicable, in accordance with any technical specifications that were initially established and communicated by the Planning Coordinator in accordance with R9.
	Incorporated changes to the inhibit threshold settings, as applicable, in accordance with any revisions to those specifications as communicated by the Planning Coordinator in accordance with R9.

Note to Auditor:

Each Distribution Provider and Transmission Owner shall provide evidence such as test reports, data sheets or other documentation that demonstrates that it meets Requirement R10.

Auditor Notes:

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R11 Supporting Evidence and Documentation

- R11.** Each Distribution Provider and Transmission Owner shall develop and submit an implementation plan within 90 days of the request from the Planning Coordinator for approval by the Planning Coordinator in accordance with R9. [Violation Risk Factor: Lower] [Time Horizon: Operations Planning]
- M11.** Each Distribution Provider and Transmission Owner shall provide evidence such as letters, emails or other dated documentation that demonstrates that it meets Requirement R11.

Registered Entity Response (Required):

Compliance Narrative:

Provide a brief explanation, in your own words, of how you comply with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

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Registered Entity Evidence (Required):

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Audit Team Evidence Reviewed (This section to be completed by the Compliance Enforcement Authority):

Compliance Assessment Approach Specific to PRC-006-NPCC-01, R11

This section to be completed by the Compliance Enforcement Authority

Review the evidence to verify the Registered Entity has:	
	Developed and submitted an implementation plan within 90 days of the request from the Planning Coordinator, if applicable.
	Received acknowledgement and approval of its implementation plan by the Planning Coordinator
Note to Auditor: Each Distribution Provider and Transmission Owner shall provide evidence such as letters, emails or other dated documentation that demonstrates that it meets Requirement R11. Note: The 90 days specified is to allow the affected entity sufficient time to plan a course of action to comply with the PC's derived studies. The completion date of the implementation plan is proposed by the entity and approved by the PC.	

Auditor Notes:

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R12 Supporting Evidence and Documentation

- R12.** Each Transmission Owner and Distribution Provider shall annually provide documentation, with no more than 15 months between updates, to its Planning Coordinator of the actual net Load that would have been shed by the UFLS relays at each UFLS stage coincident with their integrated hourly peak net Load during the previous year, as determined by measuring actual metered Load through the switches that would be opened by the UFLS relays. [Violation Risk Factor: Lower] [Time Horizon: Long Term Planning]
- M12.** Each Distribution Provider and Transmission Owner shall provide evidence such as reports, spreadsheets or other dated documentation submitted to its Planning Coordinator that indicates the frequency set point, the

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net amount of load shed and the percentage of its peak load at each stage of its UFLS program coincident with the integrated hourly peak of the previous year that demonstrates that it meets Requirement

Registered Entity Response (Required):

Compliance Narrative:

Provide a brief explanation, in your own words, of how you comply with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

Registered Entity Evidence (Required):

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Audit Team Evidence Reviewed (This section to be completed by the Compliance Enforcement Authority):

Compliance Assessment Approach Specific to PRC-006-NPCC-01, R12

This section to be completed by the Compliance Enforcement Authority

Review the evidence to verify the Registered Entity has:

Annually, with no more than 15 months between updates, provided UFLS documentation to the Planning Coordinator that is responsive to the Planning Coordinators requests and which contains as a minimum the following information:
The actual net Load that would have been shed by the UFLS relays at each UFLS stage coincident with their integrated hourly peak net Load during the previous year, as determined by measuring actual metered Load through the switches that would be opened by the UFLS relays.

Note to Auditor:

In accordance with R20, the Planning Coordinator is required to update its UFLS program database as specified by the NERC PRC Standard on UFLS. Based on the numerous inputs that the databases must capture, the Planning Coordinator may ask for additional information to be provided by the registered entity within the period specified by R12 or in accordance with a different schedule, as necessary.

Auditor Notes:

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R13. Each Generator Owner shall set each generator underfrequency trip relay, if so equipped, below the appropriate generator underfrequency trip protection settings threshold curve in Figure 1, except as otherwise exempted in Requirements R16 and R19. [Violation Risk Factor: High] [Time Horizon: Long Term Planning]

R13 Supporting Evidence and Documentation

M13. Each Generator Owner shall provide evidence such as reports, data sheets, spreadsheets or other documentation that demonstrates that it meets Requirement R13.

Registered Entity Response (Required):

Compliance Narrative:

Provide a brief explanation, in your own words, of how you comply with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

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Audit Team Evidence Reviewed (This section to be completed by the Compliance Enforcement Authority):

Compliance Assessment Approach Specific to PRC-006-NPCC-01, R13

This section to be completed by the Compliance Enforcement Authority

Review the evidence to verify the Registered Entity has:

Set each generator underfrequency trip relay, if so equipped, below the appropriate generator underfrequency trip protection settings threshold curve as shown in Figure 1.

Note to Auditor:

R13 covers all generators and requires all generators to meet the specific curve(s) as specified in Figure 1, except as otherwise exempted within this standard. This was written in this manner to prevent a double

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jeopardy situation, or requirement ambiguity from being created, for those generators that do trip above the curve but provide compensatory load shedding (R16, and the related processes R17, R18) and for certain existing boiling water reactors that do trip above the curve and do not provide compensatory load shedding (R19). R16 & R19 addresses those generators otherwise exempted within this standard.

In accordance with R20, the Planning Coordinator is required to update its UFLS program database as specified by the NERC PRC Standard on UFLS. Based on the numerous inputs that the databases must capture, the Planning Coordinator may ask for additional information to be provided by the registered entity within the period specified by R13 or in accordance with a different schedule, as necessary.

Auditor Notes:

R14 Supporting Evidence and Documentation

R14. Each Generator Owner shall transmit the generator underfrequency trip setting and time delay to its Planning Coordinator within 45 days of the Planning Coordinator's request. [Violation Risk Factor: High] [Time Horizon: Operations Planning]

M14. Each Generator Owner shall provide evidence such as emails, letters or other dated documentation that demonstrates that it meets Requirement R14.

Registered Entity Response (Required):

Compliance Narrative:

Provide a brief explanation, in your own words, of how you comply with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

Registered Entity Evidence (Required):

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Audit Team Evidence Reviewed (This section to be completed by the Compliance Enforcement Authority):

Compliance Assessment Approach Specific to PRC-006-NPCC-01, R14

This section to be completed by the Compliance Enforcement Authority

Review the evidence to verify the Registered Entity has:	
	Received a written request from the Planning Coordinator asking for generator underfrequency trip settings and time delays.
	Written, dated, correspondence indicating that the Generator Owner provided its generator underfrequency trip settings and associated time delays to its Planning Coordinator within 45 days of the Planning Coordinator's request.
Note to Auditor: In accordance with R20, the Planning Coordinator is required to update its UFLS program database as specified by the NERC PRC Standard on UFLS. Based on the numerous inputs that the databases must capture, the Planning Coordinator may ask for additional information to be provided by the registered entity within the period specified by R14 or in accordance with a different schedule, as necessary.	

Auditor Notes:

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R15 Supporting Evidence and Documentation

- R15.** Each Generator Owner with a new generating unit, scheduled to be in service on or after the effective date of this Standard, or an existing generator increasing its net capability by greater than 10% shall: [Violation Risk Factor: High] [Time Horizon: Long Term Planning]
- 15.1** Design measures to prevent the generating unit from tripping directly or indirectly for underfrequency conditions above the appropriate generator tripping threshold curve in Figure 1.
- 15.2** Design auxiliary system(s) or devices used for the control and protection of auxiliary system(s), necessary for the generating unit operation such that they will not trip the generating unit during underfrequency conditions above the appropriate generator underfrequency trip protection settings threshold curve in Figure 1.
- M15.** Each Generator Owner shall provide evidence such as reports, data sheets, specifications, memorandum or other documentation that demonstrates that it meets

Requirement R15.

Registered Entity Response (Required):

Compliance Narrative:

Provide a brief explanation, in your own words, of how you comply with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

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Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

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Audit Team Evidence Reviewed (This section to be completed by the Compliance Enforcement Authority):

Compliance Assessment Approach Specific to PRC-006-NPCC-01, R15

This section to be completed by the Compliance Enforcement Authority

Review the evidence to verify the Registered Entity has:	
	Has designed or modified its new or power uprated generating unit(s) to prevent them from tripping directly or indirectly for underfrequency conditions above the appropriate generator tripping threshold curve in Figure 1.
	Has designed its auxiliary system(s) or devices used for the control and protection of auxiliary system(s), necessary for the generating unit operation, such that they will not trip the generating unit during underfrequency conditions above the appropriate generator underfrequency trip protection settings threshold curve in Figure 1.

Note to Auditor:

R15 was written for clarity to communicate that a new generator, or an existing generator with increased net capability greater than 10%, has to not only meet the curve in Figure 1 for the generator trip relay (R15.1) but also to have a plant design such that auxiliary systems do not cause the plant, and consequently the generating unit with it, to trip for underfrequency above the Figure 1 curve (R15.2). In addition R15.1 differs from R13 in that no exemptions are permitted. It must trip above the curve in all cases and no allowance (exemption) is permitted such as allowing for compensatory load shedding alternatives.

Auditor Notes:

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- R16. Each Generator Owner of existing non-nuclear units in service prior to the effective date of this standard that have underfrequency protections set to trip above the appropriate curve in Figure 1 shall: [Violation Risk Factor: High] [Time Horizon: Long Term Planning]

R16 Supporting Evidence and Documentation

16.1 Set the underfrequency protection to operate at the lowest frequency allowed by the plant design and licensing limitations.

16.2 Transmit the existing underfrequency settings and any changes to the underfrequency settings along with the technical basis for the settings to the Planning Coordinator.

16.3 Have compensatory load shedding, as provided by a Distribution Provider or Transmission Owner that is adequate to compensate for the loss of their generator due to early tripping.

- M16. Each Generator Owner with existing non-nuclear units in service prior to the effective date of this Standard which have underfrequency tripping that is not compliant with Requirement R13 shall provide evidence such as reports, spreadsheets, memorandum or dated documentation demonstrating that it meets Requirement R16.

Registered Entity Response (Required):

Compliance Narrative:

Provide a brief explanation, in your own words, of how you comply with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

File Name	Document Title	Revision or Version	Document Date	Relevant Page(s) or Section(s)	Description of Applicability of Document

Audit Team Evidence Reviewed (This section to be completed by the Compliance Enforcement Authority):

Compliance Assessment Approach Specific to PRC-006-NPCC-01, R16

This section to be completed by the Compliance Enforcement Authority

Review the evidence to verify the Registered Entity has:

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	Evidence such as reports, spreadsheets, memorandum or dated documentation demonstrating that the underfrequency protection was set to operate at the lowest frequency allowed by the plant design and licensing limitations.
	Transmitted the existing underfrequency settings and any changes to the underfrequency settings along with the technical basis for the settings to the Planning Coordinator as documented in earlier correspondence or as demonstrated by responding to the Planning Coordinator's request per R14.
	Established compensatory load shedding, as provided by a Distribution Provider or Transmission Owner, that is adequate to compensate for the loss of their generator due to early tripping.
	Has followed the processes, as applicable, as established by PRC-006-NPCC-1 Attachment A or PRC-006-NPCC-1 Attachment B for implementation of Compensatory Load Shedding Criteria in Canada or the United States, respectfully.

Note to Auditor:

R16 addresses an existing class of non-nuclear units that trip above the threshold curve for setting underfrequency trip protection for generators and which already provide compensatory load shedding in accordance with existing procedures. Requirement R16.2 also requires changes to underfrequency settings, along with the technical basis for those settings from generators in this class of units, to be transmitted to the planning coordinator. It is the expectation that based on the absence of a time-frame in Requirement R16.2 that those entities immediately upon identification of such a change would notify the Planning Coordinator.

Refer to PRC-006-NPCC-1 Attachment A or PRC-006-NPCC-1 Attachment B explaining the processes to be followed in Canada and the United States, respectfully.

In accordance with R20, the Planning Coordinator is required to update its UFLS program database as specified by the NERC PRC Standard on UFLS. Based on the numerous inputs that the databases must capture, the Planning Coordinator may ask for additional information to be provided by the registered entity within the period specified by R15 or in accordance with a different schedule, as necessary.

Auditor Notes:

R17 Supporting Evidence and Documentation

- R17.** Each Planning Coordinator in Ontario, Quebec and the Maritime provinces shall apply the criteria described in Attachment A to determine the compensatory load shedding that is required in Requirement R16.3 for generating units in its respective NPCC area. [Violation Risk Factor: High] [Time Horizon: Long Term Planning]
- M17.** Each Planning Coordinator in Ontario, Quebec and the Maritime provinces shall provide evidence such as emails, memorandum or other documentation that demonstrates that it followed the methodology described in Attachment A and meets Requirement R17.

Registered Entity Response (Required):

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Audit ID: Audit ID if available; or NCRnnnnn-YYYYMMDD

RSAW Version: RSAW_ PRC-006-NPCC-01_V2 Revision Date: June, 2015

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Compliance Narrative:

Provide a brief explanation, in your own words, of how you comply with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

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Audit Team Evidence Reviewed (This section to be completed by the Compliance Enforcement Authority):

Compliance Assessment Approach Specific to PRC-006-NPCC-01, R17

This section to be completed by the Compliance Enforcement Authority

Review the evidence to verify the Registered Entity has:	
	Provided evidence such as emails, memorandum or other documentation that demonstrates that it followed the methodology described in Attachment A and meets Requirement R17.
	Identified, compiled and maintained an updated list of all existing non-nuclear generating units in service prior to the effective date of this standard that have underfrequency protections set to trip above the appropriate curve in Figure 1. The list shall include the following information for each unit:
	- Generator name and generating capacity.
	- Underfrequency protection trip settings, including frequency trip set points and time delays.
	- All islands within which the unit may operate, as identified in Requirement R1.
	- Physical and electrical location of the unit.
	Established the requirements for compensatory load shedding based on criteria outlined below:
	- Arranged for a Distribution Provider or Transmission Owner that owns UFLS relays within the island(s) identified by the Planning Coordinator in Requirement R1 within which the generator may operate to provide compensatory load shedding.
	- The compensatory load shedding that is provided by the Distribution Provider or Transmission Owner shall be in addition to the amount that the Distribution Provider or Transmission Owner is required to shed as specified in Requirement R4.
	- The compensatory load shedding shall be provided at the UFLS program stage (or threshold stage for Quebec) with a frequency threshold setting that corresponds to the highest frequency at which the

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	subject generator will trip above the appropriate curve in Figure 1 during an underfrequency event. If the highest frequency at which the subject generator will trip above the appropriate curve in Figure 1 does not correspond to a specific UFLS program stage threshold setting, the compensatory load shedding shall be provided at the UFLS program stage with a frequency threshold setting that is higher than the highest frequency at which the subject generator will trip above the appropriate curve in Figure 1.
	- The amount of compensatory load shedding shall be equivalent ($\pm 5\%$) to the average net generator megawatt output for the prior two calendar years, as specified by the Planning Coordinator, plus expected station loads to be transferred to the system upon loss of the facility. The net generation output should only include those hours when the unit was a net generator to the electric system. In the specific instance of a generating unit that has been interconnected to the electric system for less than two calendar years, the amount of compensatory load shedding shall be equivalent ($\pm 5\%$) to the maximum claimed seasonal capability of the generator over two calendar years, plus expected station loads to be transferred to the system upon loss of the facility.
Note to Auditor:	

Auditor Notes:

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R18 Supporting Evidence and Documentation

R18. Each Generator Owner, Distribution Provider or Transmission Owner within the Planning Coordinator area of ISO-NE or the New York ISO shall apply the criteria described in Attachment B to determine the compensatory load shedding that is required in Requirement R16.3 for generating units in its respective NPCC area.
[Violation Risk Factor: High] [Time Horizon: Long Term Planning]

M18. Each Generator Owner, Distribution Provider or Transmission Owner within the Planning Coordinator area of ISO-NE or the New York ISO shall provide evidence such as emails, memorandum, or other documentation that demonstrates that it followed the methodology described in Attachment B and meets Requirement R18.

Registered Entity Response (Required):

Compliance Narrative:

Provide a brief explanation, in your own words, of how you comply with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

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Registered Entity Evidence (Required):

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Audit Team Evidence Reviewed *(This section to be completed by the Compliance Enforcement Authority):*

Compliance Assessment Approach Specific to PRC-006-NPCC-01, R18

This section to be completed by the Compliance Enforcement Authority

	Review the evidence to verify the Registered Entity has:
	Provided evidence such as emails, memorandum or other documentation that demonstrates that it followed the methodology described in Attachment B and meets Requirement R18.
	The Generator Owner has identified and compiled a list of all existing non-nuclear generating units in service prior to the effective date of this standard that has underfrequency protection set to trip above the appropriate curve in Figure 1. The list shall include the following information associated with each unit:
	- Generator name and generating capacity.
	- Underfrequency protection trip settings, including frequency trip set points and time delays.
	- All islands within which the unit may operate, as identified in Requirement R1.
	- Physical and electrical location of the unit.
	- Smallest island within which the unit may operate as identified by the Planning Coordinator in Requirement R1 of this Standard.
	For each generating unit identified above, established the requirements for compensatory load shedding based on criteria outlined below:
	- In cases where a Distribution Provider or Transmission Owner has coordinated protection settings with the Generator Owner to cause the generator to trip above the appropriate curve in Figure 1, the Distribution Provider or Transmission Owner is responsible to provide the appropriate amount of compensatory load to be shed within the smallest island identified by the Planning Coordinator in Requirement R1 of this standard.
	- The compensatory load shedding that is provided by the Distribution Provider or Transmission Owner shall be in addition to the amount that the Distribution Provider or Transmission Owner is required to shed as specified in Requirement R4.
	- The compensatory load shedding shall be provided at the UFLS program stage with the frequency threshold setting at or closest to but above the frequency at which the subject generator will trip.
	- The amount of compensatory load shedding shall be equivalent ($\pm 5\%$) to the average net generator

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megawatt output for the prior two calendar years, as specified by the Planning Coordinator, plus expected station loads to be transferred to the system upon loss of the facility. The net generation output should only include those hours when the unit was a net generator to the electric system. In the specific instance of a generating unit that has been interconnected to the electric system for less than two calendar years, the amount of compensatory load shedding shall be equivalent ($\pm 5\%$) to the maximum claimed seasonal capability of the generator over two calendar years, plus expected station loads to be transferred to the system upon loss of the facility.

Note to Auditor:

Auditor Notes:

R19.1 Supporting Evidence and Documentation

Existing nuclear generating plants with units that have underfrequency relay threshold settings above the Eastern Interconnection generator tripping curve in Figure 1, based on their licensing design basis, shall: [Violation Risk Factor: High] [Time Horizon: Long Term Planning]

19.1 Set the underfrequency protection to operate at as low a frequency as possible in accordance with the plant design and licensing limitations but not greater than 57.8Hz.

19.2 Set the frequency trip setting upper tolerance to no greater than + 0.1 Hz.

19.3 Transmit the initial frequency trip setting and any changes to the setting and the technical basis for the settings to the Planning Coordinator.

M19. Each Generator Owner of nuclear units that have been specifically identified by NPCC as having generator trip settings above the generator trip curve in Figure 1 shall provide evidence such as letters, reports and dated documentation that demonstrates that it meets Requirement R19.

Registered Entity Response (Required):

Question: Do you own an existing nuclear generating plant(s)? ☐ Yes ☐ No

If Yes, complete the entries for R19.

Registered Entity Response (Required):

Compliance Narrative:

Provide a brief explanation, in your own words, of how you comply with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

Registered Entity Evidence (Required):

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Audit Team Evidence Reviewed *(This section to be completed by the Compliance Enforcement Authority):*

Compliance Assessment Approach Specific to PRC-006-NPCC-01, R19

This section to be completed by the Compliance Enforcement Authority

Review the evidence to verify the Registered Entity has:	
	Provided evidence such as letters, reports and dated documentation that demonstrates that it meets Requirement R19.
	Set the underfrequency protection to operate at as low a frequency as possible in accordance with the plant design and licensing limitations but not greater than 57.8Hz.
	Set the frequency trip setting upper tolerance to no greater than + 0.1 Hz.
	Transmitted the initial frequency trip setting and any changes to the setting and the technical basis for the settings to the Planning Coordinator.

Note to Auditor:

NPCC's UFLS program is designed to arrest frequency decline at or above 58.0 Hz while incorporating the performance characteristics of regional generation. In determining the 57.8 Hz limit for existing nuclear units within the NPCC Region, NPCC considered the minimum program frequency of 58.0 Hz, the existing maximum trip settings of the nuclear units (gathered through surveys) within NPCC's footprint, system response, and credible islands as determined by the NPCC Planning Coordinators. A maximum frequency threshold trip setting of 57.8 Hz for existing nuclear units provides a margin of 0.2 Hz above the highest frequency at which the nuclear units in NPCC's footprint are expected to be tripped by low coolant flow or under frequency protection and yields acceptable system performance with minimum changes required to the nuclear units. NPCC considered 0.2 Hz to be a conservative margin and was developed in consideration of the typical relay drift tolerance of ± 0.1 Hz, which ensures the units do not trip above 58.0 Hz. NPCC maintains that if existing nuclear units adhere to the 57.8 Hz maximum tripping limit requirement, islands with a 25% generation deficiency are able to survive, maintain automatic UFLS program requirements, and the program will achieve satisfactory system performance.

Auditor Notes:

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R20. The Planning Coordinator shall update its UFLS program database as specified by the NERC PRC Standard on UFLS. This database shall include the following information: [Violation Risk Factor: Lower] [Time Horizon: Operations Planning]

R20 Supporting Evidence and Documentation

20.1 For each UFLS relay, including those used for compensatory load shedding, the amount and location of load shed at peak, the corresponding frequency threshold and time delay settings.

20.2 The buses at which the Load is modeled in the NPCC library power flow case.

20.3 A list of all generating units that may be tripped for underfrequency conditions above the appropriate generator underfrequency trip protection settings threshold curve in Figure 1, including the frequency trip threshold and time delay for each protection system.

20.4 The location and amount of additional elements to be switched for voltage control that are coordinated with UFLS program tripping.

20.5 A list of all UFLS relay inhibit functions along with the corresponding settings and locations of these relays.

M20. Each Planning Coordinator shall provide evidence such as spreadsheets, system studies, or other documentation that demonstrates that it meets the requirements of Requirement R20.

Registered Entity Response (Required):

Compliance Narrative:

Provide a brief explanation, in your own words, of how you comply with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

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Audit Team Evidence Reviewed (This section to be completed by the Compliance Enforcement Authority):

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Compliance Assessment Approach Specific to PRC-006-NPCC-01, R20

This section to be completed by the Compliance Enforcement Authority

Review the evidence to verify the Registered Entity has:	
	Provided evidence such as spreadsheets, system studies, or other documentation that demonstrates that it meets the requirements of Requirement R20.
	A database that includes the following information, as applicable:
	- For each UFLS relay, including those used for compensatory load shedding, the amount and location of load shed at peak, the corresponding frequency threshold and time delay settings.
	- The buses at which the Load is modeled in the NPCC library power flow case.
	- A list of all generating units that may be tripped for underfrequency conditions above the appropriate generator underfrequency trip protection settings threshold curve in Figure 1, including the frequency trip threshold and time delay for each protection system.
	- The location and amount of additional elements to be switched for voltage control that are coordinated with UFLS program tripping, if provided.
	- A list of all UFLS relay inhibit functions along with the corresponding settings and locations of these relays.
	Maintained and updated its database at least once each calendar year, with no more than 15 months between maintenance activities, in accordance with PRC-006-1, R6.

Note to Auditor:

NERC Standard PRC-006-1 provides broad requirements that complement the more specific requirements concerning the maintenance of a UFLS database by Planning Coordinators within NPCC.

R6. Each Planning Coordinator shall maintain a UFLS database containing data necessary to model its UFLS program for use in event analyses and assessments of the UFLS program at least once each calendar year, with no more than 15 months between maintenance activities. [VRF: Lower][Time Horizon: Long-term Planning]

R7. Each Planning Coordinator shall provide its UFLS database containing data necessary to model its UFLS program to other Planning Coordinators within its Interconnection within 30 calendar days of a request. [VRF: Lower][Time Horizon: Long-term Planning]

R8. Each UFLS entity shall provide data to its Planning Coordinator(s) according to the format and schedule specified by the Planning Coordinator(s) to support maintenance of each Planning Coordinator's UFLS database. [VRF: Lower][Time Horizon: Longterm Planning]

Auditor Notes:

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R21. Each Planning Coordinator shall notify each Distribution Provider, Transmission Owner, and Generator Owner within its Planning Coordinator area of changes to load distribution needed to satisfy UFLS program performance characteristics as specified by the NERC PRC Standard on UFLS.[Violation Risk Factor: High] [Time Horizon: Long Term Planning]

R21 Supporting Evidence and Documentation

M21. Each Planning Coordinator shall provide evidence such as emails, memorandum or other dated documentation that it meets Requirement R21.

Registered Entity Response (Required):

Compliance Narrative:

Provide a brief explanation, in your own words, of how you comply with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

File Name	Document Title	Revision or Version	Document Date	Relevant Page(s) or Section(s)	Description of Applicability of Document

Audit Team Evidence Reviewed (This section to be completed by the Compliance Enforcement Authority):

Compliance Assessment Approach Specific to PRC-006-NPCC-01, R21

This section to be completed by the Compliance Enforcement Authority

Review the evidence to verify the Registered Entity has:	
	Provided evidence such as spreadsheets, system studies, or other documentation that demonstrates that it meets the requirements of Requirement R21.
	Notified each Distribution Provider, Transmission Owner, and Generator Owner within its Planning Coordinator area of changes to load distribution needed to satisfy UFLS program performance characteristics as specified by the NERC PRC Standard on UFLS, if changes were deemed necessary.
Note to Auditor: NERC Standard PRC-006-1, requires:	

R3. Each Planning Coordinator shall develop a UFLS program, including notification of and a schedule for implementation by UFLS entities within its area, that meets the following performance characteristics in simulations of underfrequency conditions resulting from an imbalance scenario, where an imbalance = $[(\text{load} - \text{actual generation output}) / (\text{load})]$, of up to 25 percent within the identified island(s). [VRF: High][Time Horizon: Long-term Planning]

3.1. Frequency shall remain above the Underfrequency Performance Characteristic curve in PRC-006-1 - Attachment 1, either for 60 seconds or until a steady-state condition between 59.3 Hz and 60.7 Hz is reached, and

3.2. Frequency shall remain below the Overfrequency Performance Characteristic curve in PRC-006-1 - Attachment 1, either for 60 seconds or until a steady-state condition between 59.3 Hz and 60.7 Hz is reached, and Volts per Hz (V/Hz) shall not exceed 1.18 per unit for longer than two seconds cumulatively per simulated event, and shall not exceed 1.10 per unit for longer than 45 seconds cumulatively per simulated event at each generator bus and generator step-up transformer high-side bus associated with each of the following:

3.3.1. Individual generating units greater than 20 MVA (gross nameplate rating) directly connected to the BES

3.3.2. Generating plants/facilities greater than 75 MVA (gross aggregate nameplate rating) directly connected to the BES

3.3.3. Facilities consisting of one or more units connected to the BES at a common bus with total generation above 75 MVA gross nameplate rating.

And

R4. Each Planning Coordinator shall conduct and document a UFLS design assessment at least once every five years that determines through dynamic simulation whether the UFLS program design meets the performance characteristics in Requirement R3 for each island identified in Requirement R2.

Auditor Notes:

R22 Supporting Evidence and Documentation

R22. Each Distribution Provider, Transmission Owner and Generator Owner shall implement the load distribution changes based on the notification provided by the Planning Coordinator in accordance with Requirement R21. [Violation Risk Factor: High] [Time Horizon: Long Term Planning]

M22. Each Distribution Provider, Transmission Owner and Generator Owner shall provide evidence such as reports, spreadsheets or other documentation that demonstrates that it meets Requirement R22.

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Registered Entity Response (Required):

Compliance Narrative:

Provide a brief explanation, in your own words, of how you comply with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

File Name	Document Title	Revision or Version	Document Date	Relevant Page(s) or Section(s)	Description of Applicability of Document

Audit Team Evidence Reviewed (This section to be completed by the Compliance Enforcement Authority):

Compliance Assessment Approach Specific to PRC-006-NPCC-01, R22

This section to be completed by the Compliance Enforcement Authority

Review the evidence to verify the Registered Entity has:	
	Provided evidence such as reports, spreadsheets or other documentation that demonstrates that it meets Requirement R22.
	Implemented the load distribution changes based on the notification provided by the Planning Coordinator.

Note to Auditor:

NERC Standard PRC-006-1, requires:

R3. Each Planning Coordinator shall develop a UFLS program, including notification of and a schedule for implementation by UFLS entities within its area, that meets the following performance characteristics in simulations of underfrequency conditions resulting from an imbalance scenario, where an imbalance = $[(\text{load} - \text{actual generation output}) / (\text{load})]$, of up to 25 percent within the identified island(s). [VRF: High][Time Horizon: Long-term Planning]

3.1. Frequency shall remain above the Underfrequency Performance Characteristic curve in PRC-006-1 - Attachment 1, either for 60 seconds or until a steady-state condition between 59.3 Hz and 60.7 Hz is reached, and

3.2. Frequency shall remain below the Overfrequency Performance Characteristic curve in PRC-006-1 - Attachment 1, either for 60 seconds or until a steady-state condition between 59.3 Hz and 60.7 Hz is

reached, and Volts per Hz (V/Hz) shall not exceed 1.18 per unit for longer than two seconds cumulatively per simulated event, and shall not exceed 1.10 per unit for longer than 45 seconds cumulatively per simulated event at each generator bus and generator step-up transformer high-side bus associated with each of the following:

3.3.1. Individual generating units greater than 20 MVA (gross nameplate rating) directly connected to the BES

3.3.2. Generating plants/facilities greater than 75 MVA (gross aggregate nameplate rating) directly connected to the BES

3.3.3. Facilities consisting of one or more units connected to the BES at a common bus with total generation above 75 MVA gross nameplate rating.

And

R4. Each Planning Coordinator shall conduct and document a UFLS design assessment at least once every five years that determines through dynamic simulation whether the UFLS program design meets the performance characteristics in Requirement R3 for each island identified in Requirement R2.

Auditor Notes:

R23 Supporting Evidence and Documentation

R23. Each Distribution Provider, Transmission Owner and Generator Owner shall develop and submit an implementation plan within 90 days of the request from the Planning Coordinator for approval by the Planning Coordinator in accordance with Requirement R21. [Violation Risk Factor: Lower] [Time Horizon: Operations Planning]

M23. Each Distribution Provider, Transmission Owner and Generator Owner shall provide evidence such as letters, emails or other dated documentation that demonstrates it meets Requirement 23.

Registered Entity Response (Required):

Compliance Narrative:

Provide a brief explanation, in your own words, of how you comply with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

DRAFT NPCC Reliability Standard Audit Worksheet

File Name	Document Title	Revision or Version	Document Date	Relevant Page(s) or Section(s)	Description of Applicability of Document

Audit Team Evidence Reviewed (This section to be completed by the Compliance Enforcement Authority):

Compliance Assessment Approach Specific to PRC-006-NPCC-01, R23

This section to be completed by the Compliance Enforcement Authority

Review the evidence to verify the Registered Entity has:	
	Provided evidence such as letters, emails or other dated documentation that demonstrates it meets Requirement 23.
	Dated evidence demonstrating that an implementation plan was produced and transmitted to the Planning Coordinator within 90 days of the request.
	Evidence demonstrating Planning Coordinator approval.
	Evidence of completion of the required load distribution changes or progress made in accordance with the approved Implementation Plan.

Note to Auditor:

NERC Standard PRC-006-1, requires:

R3. Each Planning Coordinator shall develop a UFLS program, including notification of and a schedule for implementation by UFLS entities within its area, that meets the following performance characteristics in simulations of underfrequency conditions resulting from an imbalance scenario, where an imbalance = $[(\text{load} - \text{actual generation output}) / (\text{load})]$, of up to 25 percent within the identified island(s). [VRF: High][Time Horizon: Long-term Planning]

3.1. Frequency shall remain above the Underfrequency Performance Characteristic curve in PRC-006-1 - Attachment 1, either for 60 seconds or until a steady-state condition between 59.3 Hz and 60.7 Hz is reached, and

3.2. Frequency shall remain below the Overfrequency Performance Characteristic curve in PRC-006-1 - Attachment 1, either for 60 seconds or until a steady-state condition between 59.3 Hz and 60.7 Hz is reached, and Volts per Hz (V/Hz) shall not exceed 1.18 per unit for longer than two seconds cumulatively per simulated event, and shall not exceed 1.10 per unit for longer than 45 seconds cumulatively per simulated event at each generator bus and generator step-up transformer high-side bus associated with each of the following:

3.3.1. Individual generating units greater than 20 MVA (gross nameplate rating) directly connected to the BES

3.3.2. Generating plants/facilities greater than 75 MVA (gross aggregate nameplate rating) directly

connected to the BES

3.3.3. Facilities consisting of one or more units connected to the BES at a common bus with total generation above 75 MVA gross nameplate rating.

And

R4. Each Planning Coordinator shall conduct and document a UFLS design assessment at least once every five years that determines through dynamic simulation whether the UFLS program design meets the performance characteristics in Requirement R3 for each island identified in Requirement R2.

Auditor Notes:

Additional Information:

Reliability Standard

The full text of PRC-006-NPCC-01 – “Automatic Underfrequency Load Shedding” may be found on the NERC Web Site (www.nerc.com) under “Program Areas & Departments”, “Reliability Standards.”

In addition to the Reliability Standard, there is an applicable Implementation Plan available on the NERC Web Site.

In addition to the Reliability Standard, there is background information available on the NERC Web Site.

Capitalized terms in the Reliability Standard refer to terms in the NERC Glossary, which may be found on the NERC Web Site.

Revision History for RSAW PRC-006-NPCC-01

Version	Date	Reviewers	Revision Description
1	04/01/2015	NPCC/CC	New Document
2	06/15/15	NPCC/CC	Implement Commetns from CC, and Updated Format to NERC RSAW Template.