SPP PC UFLS Plan

Planning Coordinator: Charles Hendrix
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SME Signature	Date

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SPP Southwest Power Pool

Revision History

Date or Version Number	Author	Change Description	Comments
7/2/2013	SPCWG	Rev. 0	Initial draft
7/16/2013	SPP Planning Coordinator	Rev. 1	MOPC approved SPCWG's Recommendation to endorse the UFLS Plan from the Consent Agenda
6/03/2014	SPP Planning Coordinator	Rev. 2	Incorporated RCWG revisions. Added Appendices A-E. Grammatical and formatting edits.
6/20/2014	SPP Planning Coordinator	Rev. 2.1	RCWG, SPCWG, UFLS Entities comments
6/24/2014	SPP Planning Coordinator	Rev. 3	For final RCWG, SPCWG recommendations
10/21/2014	SPP Planning Coordinator	Rev. 3.1	Stakeholder process cleanup. Section 6.0 – UFLS Program < 100MW: specified frequency setpoints. Appendix B – UFLS Data: enhanced instructions.
8/18/2015	SPP Planning Coordinator	Rev. 4	For final SPCWG recommendations. Definition for UFLS Entity modified to include PC authority to require an Entity to install UFLS equipment. Posted for comment. Inclusion of PRC-006-2 "Corrective Action Plan" changes. Nonmaterial change in Section 9.0: change "survey form" to "the Attestation Form" to clarity which form is uploaded.
9/17/2015	SPP Planning Coordinator	Rev. 4.1	Considers submitted comments and September 11, 2015 conference call input. Final.
9/30/2015	SPP Planning Coordinator	Rev. 4.2	Language cleanup "TO, DP" language to include "TO, DP, and GO" (PRC-006-2, R4.1 through R4.6).

7/13/2016	SPP Planning Coordinator	Rev. 4.3	Presented to SPCWG. Language cleanup. Remove RCWG in 17.3 since the SPP PC UFLS Plan review RCWG Action Item is completed. Copy PRC-006-2.R3 into UFLS Plan, Section 3.0. Section 5.0, generator auxiliary load exclusion from imbalance equation. Update Appendix B, "UFLS Data". Remove from Appendix C, "Changes to boundaries of a specific island are identified". Update Appendix E, "Reporting Instructions".
9/30/2016	SPP Planning Coordinator	Rev 4.3	Considered comments from July 13, 2016 SPCWG Meeting. G.O. responsibilities from Section 10 to Section 9. Time allowed for response to data request is changed to 60 days. Final.
8/16/2018	SPP Planning Coordinator	Rev. 4.4	Made changes to the plan to clarify that DPs are UFLS entities if they have UFLS relays. Also made changes to section 17 regarding how to modify the UFLS plan and made changes removing the "-2" on the end of the standard. Replaced all references to TrueShare with the corresponding references to GlobalScape. Removed references to Special Protection Systems (SPS) and renamed it to Remedial Action Schemes (RAS).
2/26/2019	SPP Planning Coordinator	Rev. 4.5	Added the SPS/Xcel Study Island
6/15/2020	SPP Planning Coordinator	Rev. 4.6	Added request for removal requirements. Added references to request documents and removed the Appendix B - UFLS Data, Appendix D - Attestation Form, and Appendix E - Reporting Instructions.

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Introduction

The Southwest Power Pool Planning Coordinator (SPP PC) Automatic Underfrequency Load Shedding Plan (UFLS Plan) is designed to develop, coordinate, and document requirements for automatic underfrequency load shedding (UFLS) programs to arrest declining frequency and to assist with the recovery of frequency following underfrequency events. In order to evaluate the UFLS Plan, the SPP PC will collect UFLS data annually and perform the design assessment at least once every five years.

UFLS Entity Definition

The SPP PC UFLS Plan applies to Generator Owners (GO) and UFLS entities. UFLS entities are entities responsible for the ownership, operation, or control of UFLS equipment as required by the UFLS program established by the PCs. Such entities may include one or both of the following: Transmission Owners (TO) and Distribution Providers (DP). This UFLS Plan requires annual updates to the UFLS data by UFLS entities. An SPP PC UFLS entity can be either a TO or a DP.

A DP that is considered a UFLS entity will generally meet the following conditions:

- Owns and operates (armed) automatic UFLS equipment to arrest frequency decline for UFLS events defined by PRC-006.
- Has total DP load greater than or equal to what is specified by NERC in the most current Statement of Compliance Registry Criteria for a Distribution Provider. DPs under the load threshold specified by NERC will also be subject to the UFLS Plan if they own and operate UFLS equipment in the SPP PC footprint.

A TO that is considered a UFLS entity will meet the following condition:

- Owns and operates (armed) automatic UFLS equipment to arrest frequency decline for UFLS events defined by PRC-006 in the SPP PC footprint.

UFLS entities seeking changes to the status of their UFLS equipment shall coordinate with TOs/DPs that are directly impacted by the operation of UFLS equipment and obtain SPP PC approval. New entities being added to the SPP PC footprint who qualify as UFLS entities based on the criteria above shall coordinate their UFLS equipment data with the SPP PC UFLS contact and adhere to the SPP PC UFLS implementation schedule Appendix B. These new Entities shall also coordinate with TOs/DPs that are directly impacted by the operation of UFLS equipment if applicable.

SPP PC would entertain a request for removal from the SPP UFLS Plan based on the following requirements:

a. Entity is solely registered as a UFLS only DP Entity.
b. Entity current year and projected future year summer/winter peak load (MDWG Model) is below the registration threshold of 75MW.
c. Completion of a Sensitivity analysis with and without the Entities UFLS relays during the next 5 year SPP UFLS design assessment. The sensitivity analysis must meet PRC-006 requirements.
d. Formal request to the SPCWG as well as the SPP PC for removal.
e. A recommendation from the SPCWG to remove the Entity from the UFLS plan to the SPP PC.
f. If in the future SPP determines that the Entity's relays are necessary to meet the UFLS plan's requirement(s), the Entity will re-register as a DP or UFLS only DP and become a UFLS Entity.

Once an Entity has been approved by the PC to be removed from the UFLS program, the Entity must also provide evidence that it is no longer registered as a UFLS only DP as well as notification when the relays are disabled from tripping for UFLS to the SPP PC and the SPCWG.

The SPP PC may require TOs, DPs, and GOs within its Island(s) to install UFLS relays based on the Island(s) need to meet NERC PRC-006 as a result of an event, study, and or mitigation plan.

SPP PC UFLS Plan

Section 1.0 - Study Island Identification (R1)

R1 requires criteria be specified for the selection of a study island. The SPP PC will examine historical events as well as conduct future studies to determine the adequacy of its UFLS system. When the SPP PC has evidence to warrant investigation of including more than one UFLS island, it will coordinate the analysis with the System Protection and Control Working Group (SPCWG), UFLS entities, and other affected PCs to develop a subsequent UFLS Plan to meet NERC PRC-006.

Section 2.0 - Island Selection (R2)

The SPP PC has identified two islands to serve as a basis for designing its UFLS program. The islands are identified as follows

- The SPP PC Island (less Southwestern Public Service (SPS/Xcel))
- The SPS/Xcel Island

The SPP PC Island was selected by considering the following:

- Those islands selected by applying the criteria in Section 1.
- Any portions of the bulk electric system (BES) designed to detach from the Interconnection (planned islands) as a result of the operation of a relay scheme or Remedial Action Scheme.
- A single island that includes all portions of the BES in either the Regional Entity area or the Interconnection in which the PC's area resides. If a PC's area resides in multiple Regional Entity areas, each of those Regional Entity areas will be identified as an island. PCs 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.
- System studies.
- Changes to the PC island boundary.
- Review of historical events.

The SPS/Xcel Island was selected by considering the following:

- Request of SPS/Xcel after review of historical events that indicated past UFLS events in the SPS/Xcel area as recently as 2008.

Section 3.0 – Performance Characteristics (R3, R10)

3.1 Frequency Performance Characteristics (R3)

As a part of the SPP PC UFLS evaluation, frequency shall remain within the under-frequency and over-frequency range of the curve in Attachment 1, either for 60 seconds or until a steady-state condition between 59.3 Hz and 60.7 Hz is reached (R3 requirements related to 3.1 and 3.2 of the standard).

3.2 Volts/Hz (V/Hz) limits (R3)

As a part of the SPP PC UFLS evaluation, V/Hz for all SPP PC UFLS entities' generators at a generator terminal bus and/or a generator step-up (GSU) transformer high-side bus will be studied. This study is performed to assess generators and transformers magnetic flux during a 25% generation loss scenario. The actual magnitude of magnetic flux in the generator stator or transformer core is difficult to measure; however, it can be quantified in terms of per unit V/Hz, since the operating magnetic flux in electric machines is proportional to the ratio of the operating voltage to the electrical frequency. Therefore, V/Hz provides a measure of generator stator and transformer core magnetic flux. Excessive magnetic flux in the transformer or generator results in thermal damages to the generator and GSU transformer. These damages are typically cumulative and include, but are not limited to, generator stator and GSU transformer core damage and degradation of insulation material. Excessive magnetic flux may also cause unwanted operation of protection system. The objective of the study is to identify generator terminal or GSU transformer high-side buses for which V/Hz exceeds stipulated values of 1.18 PU for longer than two seconds cumulatively, or 1.1 PU for longer than 45 seconds cumulatively for the simulated event of 25% generation loss scenario.

Therefore, Volts per Hz (V/Hz) will not exceed 1.18 per unit for longer than two seconds cumulatively per simulated event and will 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:

- Individual generating units greater than 20 MVA (gross nameplate rating) directly connected to the bulk electric system (BES).
- Generating plants/facilities greater than 75 MVA (gross aggregate nameplate rating) directly connected to the BES.
- Facilities consisting of one or more units connected to the BES at a common bus with total generation above 75 MVA gross nameplate rating.

3.3 Automatic switching of equipment for over-voltage control (R10)

The SPP PC has not identified the need to require Transmission Owners (TO) to provide automatic switching of its existing equipment (capacitor banks, Transmission Lines, and reactors) to control over-voltage as a result of Underfrequency load shedding. When the SPP PC has identified the need to require Transmission Owner to provide automatic switching of its existing equipment to control over-voltage as a result of Underfrequency load shedding the SPP PC will notify the TOs of the effective date to implement this section of the SPP PC UFLS Plan. The TO will follow the Schedule for Implementation, Appendix B, upon notification by the SPP PC.

Section 4.0 – PC Coordination (R5 and R7)

4.1 Island and Program Design (R5)

When multiple PCs are included in the SPP PC UFLS island, SPP, as the PC, will coordinate its UFLS program design with adjacent PCs whose areas or portions of whose areas are also part of the same identified island through one of the following:

- Develop a common UFLS program design and schedule for implementation among the PCs whose areas or portions of whose areas are part of the same identified island; or

- Conduct a joint UFLS design assessment at least every five years among the PCs whose areas or portions of whose areas are part of the same identified island; or
- Conduct an independent UFLS design assessment per the SPP PC UFLS Plan, and if the assessment fails to meet SPP PC UFLS Plan, identify modifications to the UFLS program(s) to meet the SPP PC UFLS Plan and report these modifications as recommendations to the other PCs whose areas or portions of whose areas are also part of the same identified island and the ERO.

4.2 Data (R7)

The SPP PC will provide its UFLS database containing data necessary to model its UFLS program to other PCs within its Interconnection within 30 calendar days of a request for data.

Section 5.0 - UFLS Program > 100MW (R8)

Each UFLS entity that has a total forecasted peak Load as specified in the annual data request greater than or equal to 100 MW will develop and implement an automatic UFLS program that meets the following requirements:

- A minimum of 10% will be shed at each UFLS step in accordance with the table below.

UFLS Step	Frequency (hertz)	Minimum accumulated load relief as percentage of forecasted peak Load (%)	Maximum accumulated load relief as percentage of forecasted peak Load (%)
1	59.3	10	25
2	59.0	20	35
3	58.7	30	45

- The intentional relay time delay for UFLS will be less than or equal to 30 cycles.
- There is no minimum total clearing time (relay operating time + breaker trip time).
- Undervoltage inhibit setting will be less than or equal to 85% of nominal voltage.

UFLS entities may implement an aggregated UFLS program with other UFLS entities. The 100 MW limit refers to the aggregated plan, if one exists.

Generator auxiliary load is excluded from the "load" in the imbalance equation of R3, "Imbalance = [load – actual generation output) / (load)]". An Entity may exclude auxiliary load in the imbalance equation if the auxiliary load is modeled in the UFLS powerflow model.

Section 6.0 – UFLS Program < 100MW (R8)

Each UFLS entity that has a total forecasted peak Load as specified in the annual data request less than 100 MW will develop and implement an automatic UFLS program that meets the following sections:

- A minimum of one UFLS step with the frequency set point that can be any of the following: 59.3 Hz, 59.0 Hz, or 58.7 Hz. If the current frequency set point is not 59.3 Hz, 59.0 Hz, or 58.7 Hz then the UFLS Entity will change the set point to the nearest of 59.3 Hz, 59.0 Hz, or 58.7 Hz per the SPP PC UFLS Schedule of Implementation.

- The minimum accumulated Load relief will be at least 30% of the forecasted peak Load.
- The intentional relay time delay for UFLS will be less than or equal to thirty (30) cycles.
- Undervoltage inhibit setting will be less than or equal to 85% of nominal voltage.
- UFLS entities may implement an aggregated UFLS program with other UFLS entities. The 100 MW limit refers to the aggregated plan, if one exists.

Generator auxiliary load is excluded from the "load" in the imbalance equation of R3, "Imbalance = [load – actual generation output) / (load)]". An Entity may exclude auxiliary load in the imbalance equation if the auxiliary load is modeled in the UFLS powerflow model.

Section 7.0 – Reserved

Section 8.0 –Technical Assessment

The PC will perform and document a UFLS technical assessment according to NERC Standard PRC-006.

Section 9.0 – TO, DP, and GO Data Submittal (R6)

The PC will annually request the completion of an Attestation Form and UFLS data from each registered TO, DP, and GO in its PC area. Each TO, DP, and GO will provide the requested information to the PC within 60 calendar days.

For those entities with GlobalScape access upload the Attestation Form to:

https://sppdocushare.spp.org/EFTClient/Account/Login.htm#/

↦ ***"Individual TO, DP, and GO by NCR number"*** **(sub-folder, i.e. "CAS_AEP (NCR01056)").**

↦PRC-006

↦Applicable Year

Example: The DP "ABC" will post their signed Attestation Form and Inventory Spreadsheet in the sub-folder "ABC" within GlobalScape.

For those entities without GlobalScape access submit survey form via email to:
The UFLS subject matter expert, see Appendix A.

9.1 Attestation Form

The Attestation Form will state the Submission Period (example, Annual submittal for 2018) and the required Reporting Period (example, October 1 through November 30, 2018) for each applicable Entity (by individual NCR number) to complete the form and if applicable supply the UFLS data to the PC. The responding Entity will complete the Form by checking all the following items that apply:

- Entity is a Transmission Owner.
- Entity is a Distribution Provider.

- Entity is a Generator Owner.

TO/DP Entities

- Entity owns Automatic Underfrequency Load Shedding (UFLS) Relay(s).
- Entity does not own any UFLS Relays.
- Entity owns Automatic Load Restoration (ALR) Relay(s). (R4.7).
- Entity does not own any ALR Relays.

GO Entities

- Entity owns generation protection equipment.
- Entity does not own generation protection equipment.

The Entity must sign and complete the remainder of the form.

9.2 UFLS Data (R6)

The UFLS data is necessary to model the SPP PC UFLS program for use in event analysis and assessments of the UFLS program. The data and format for the data will be reviewed by the SPCWG. Requirements for the UFLS Data are specified in the data request.

9.3 SPP PC UFLS Contact

If GlobalScape access is denied by an entity, the entity is to submit the UFLS Data and Attestation Form via email to the SPP PC UFLS Subject Matter Expert (SME), see Appendix A.

9.4 TO/DP/GO Contact and Changes

The SPP PC requires a registered TO/DP/GO in the PC to provide at minimum the Compliance Contact. Changes or additions to the TO/DP/GO contact(s) should be submitted via email to the SPP PC SME, Appendix A.

9.5 SPP PC Planning Model

The SPP PC will utilize a near term summer peak power flow model to build a near term summer peak stability case in order to perform the UFLS assessment and annual database maintenance. The location of the model will be specified in the annual data request.

Percentage of UFLS Entity load shed is based on that entities' total load in the specified model.

Example 9.5.1: The October 2018 UFLS request based UFLS load shed amount on the SPP Model Development Working Group (MDWG) 2018 Series.

Registered TO/DPs submitting UFLS data on behalf of their members will group the data in such a way as to clearly identify compliance with the UFLS Plan.

Example 9.5.2: A TO who report UFLS data for multiple DP's might show an unbalanced mixture of DP's loads being shed in each UFLS Step 1, 2, and 3 while each step meets the 10% total trip requirement. UFLS data can be grouped by DP's within each Step with subtotals of percent load shed by group within the Step.

Access to the models is controlled through CEII. If you require access to these models please contact the SPP UFLS Plan SME, Appendix A.

Section 10.0 – Reserved

Section 11.0 – Generator Owner Trip Verification

Each Generator Owner will verify that their generating unit(s) will not trip above the generator underfrequency curve and will not trip below the generator overfrequency curve in NERC PRC-006 Attachment 1 as a result of the unit(s) frequency protective relay settings.

For generating units with operating characteristics that limit the unit's ability to perform in accordance with this requirement, the Generator Owner will provide to the PC technical evidence demonstrating that the unit cannot operate within the specified frequency range without causing equipment damage or violating manufacturer's published equipment ratings.

PRC-006 Requirements 4.1 through 4.6 requires SPP to consider and model protective relays for generators that trip in the "no trip zone" defined in the diagram during the development of SPP UFLS Program. The diagram in PRC-006 Attachment 1 shows the "no trip zone" as the area between the two outside curves. At a minimum, during the UFLS design assessment SPP PC will simulate generator protection systems that trip generation when frequency is in the "no trip zone". This action applies to units that are identified in PRC-006 Requirements 4.1 through 4.6.

Section 12.0 – Supplemental Load Shedding

The PC will determine if the Generator Owner has provided technical evidence demonstrating the unit cannot operate within the specified frequency range without causing equipment damage or violating manufacturer's published equipment ratings.

The PC will determine if the UFLS program performance is degraded due to the removal of any generation identified in accordance with Section 11 and verified in accordance with Section 11.

If the PC determines the UFLS program is degraded in accordance with Section 11 and supplementary load shedding is, therefore, required, the PC will notify the Generator Owner or UFLS entity(s) in accordance with the following:

- Where the Generator Owner is a UFLS entity and has the required amount of supplementary load available, the PC will notify the Generator Owner of load the entity is required to shed (in addition to that required in accordance with Section 5 and Section 6).
- Where the Generator Owner is not a UFLS entity, or does not have the required supplementary load available for shedding, the PC will notify any other UFLS entity(s) within the PC's area of load the entity(s) is required to shed (in addition to that required in accordance with Section 5 and Section 6).

Section 13.0 – Implementation of Supplemental Load Shedding

The Generator Owner or other UFLS entity(s) will implement supplementary shedding of load required by the PC in accordance with Section 12.

Section 14.0 - Data Coordination with other Planning Coordinators (R7)

SPP PC will provide its UFLS database containing data necessary to model its UFLS program to other PCs within its Interconnection within 30 calendar days of a request for data.

Section 15.0 – Post Event UFLS Plan Design Assessment (R11-12, R15)

The SPP PC, in whose area a BES islanding event results in system frequency excursions below the initializing set points of the UFLS program, will conduct and document an assessment of the event within one year of event actuation to evaluate the performance of the UFLS equipment and the effectiveness of the UFLS program.

When UFLS program deficiencies are identified, the SPP PC will conduct and document a UFLS design assessment within two years of event actuation to consider the identified deficiencies, see Section 20.

Section 16.0 – Post Event Island Assessment Coordination (R13)

The SPP PC, in whose area a BES islanding event occurred that also included the area(s) or portions of area(s) of other PCs in the same islanding event and that resulted in system frequency excursions below the initializing set points of the UFLS program, will coordinate its event assessment with all other PCs whose areas or portions of whose areas were also included in the same islanding event through one of the following:

- Conduct a joint event assessment among the PCs whose areas or portions of whose areas were included in the same islanding event; or
- Conduct an independent event assessment that reaches conclusions and recommendations consistent with those of the event assessments of the other PCs whose areas or portions of whose areas were included in the same islanding event; or
- Conduct an independent event assessment and where the assessment fails to reach conclusions and recommendations consistent with those of the event assessments of the other PCs whose areas or portions of whose areas were included in the same islanding event, identify differences in the assessments that likely resulted in the differences in the conclusions and recommendations and report these differences to the other PCs whose areas or portions of whose areas were included in the same islanding event and the ERO.

Section 17.0 – Plan Change Coordination (R12)

Changes to the SPP PC Plan could be initiated by a UFLS study, UFLS event, identified deficiency in the Plan, TO or DP changes in the PC footprint, or UFLS entity requests. UFLS entities may request changes to the SPP PC UFLS Plan through the SPCWG and the PC. Communication to the SPCWG is through the SPCWG Secretary and Chair. The SPCWG contact information is on the SPP corporate web site: **www.spp.org** > Organizational Groups.

Appeals on the UFLS Plan may be brought to the PC and the SPCWG. If the appeal(s) is accepted by the PC, SPP staff will revise the UFLS Plan and resubmit the revised plan to SPCWG for review.

17.1 Modification

- UFLS entities and Transmission Owners within its Planning Coordinator area may request changes to the SPP UFLS Plan through the SPCWG and the SPP PC. Modifications to the UFLS Plan may be made by the PC.
- The SPP PC may designate TO/DP/GO(s) within its PC footprint to meet performance requirements under the SPP PC UFLS Plan per PRC-006.
- The Reliability Compliance Working Group (RCWG) may request changes to the UFLS Plan.
- UFLS entities seeking changes to the status of their UFLS equipment shall coordinate with TOs/DPs that are directly impacted by the operation of UFLS equipment and obtain SPP PC approval.
- The SPP PC may require TOs, DPs, and GOs within its Island(s) to install UFLS relays based on the need to meet NERC PRC-006 as a result of an event, study, and or mitigation plan.
- The SPP PC will consider and respond to all written comments and will approve appropriate changes to the Plan at its discretion. The SPP PC is the final authority in Plan changes.
- The SPCWG will review changes to the SPP PC UFLS Plan.
- Conflicts that arise in SPP PC changes to the UFLS Plan and UFLS entities will be resolved by the SPCWG.
- The Appendices contain information that aids in supporting the SPP PC UFLS Plan. This information may require changes that facilitate the program implementation that should not require SPCWG review. Examples of these changes could include contacts or data formats related to UFLS Data. These changes will be reviewed by the SPCWG Chair. Significant changes to the SPP PC UFLS Plan will follow the above Modification procedures.

17.2 Appeal Process

Appeals on the UFLS Plan may be brought to the PC and the SPCWG. If the appeal(s) is accepted by the SPP PC, SPP staff will revise the UFLS plan and resubmit the revised plan to the SPCWG for review.

17.3 Comment Period

The SPP PC will provide a comment period of 15 days and respond to comments from its UFLS entities, TO, DP, and GOs on changes to the SPP PC UFLS Plan. The revised SPP UFLS Plan will be posted on **www.spp.org**, in Organization Groups, System Protection and Control Working Group, SPCWG Documents. Notification will also be sent to the SPCWG (Members Only), Primary and Secondary Compliance contacts, and the UFLS entities email lists.

Section 18.0 – Notifications (R3)

The SPP PC Plan notifications are by email to SPP PC registered TO, DP, and GOs. The notification will:

- Include the UFLS data submittal 60-day open and close dates.
- Reference the applicable SPP UFLS Plan.
- Include the applicable Implementation Schedule**,** Appendix B.

- Include Reporting Instructions**,** which provide details on how the TO/DP/GO is to post and complete data for the request. The document will be included with the annual data request, also available in the link UFLS Documents.
- Include the applicable Attestation Form**,** for the TO/DP/GO to complete and post per the Reporting Instructions. The document will be included with the annual data request, also available in the link UFLS Documents.
- Provide location and access instructions to the UFLS Model Database and Inventory Database.

Section 19.0 – Schedule for Implementation (R3)

The initial Schedule for Implementation of the SPP PC UFLS Plan was based on the MOPC approved Plan, July 16, 2013 UFLS Plan, see Appendix B. The Schedule for Implementation will be updated as required by NERC applicable standards or by the SPP PC to reflect changes to the SPP UFLS Plan.

Section 20.0 – Corrective Action Plan (R15)

Should the design assessment performed after an event reveal a UFLS deficiency, the PC shall develop a Corrective Action Plan within two years of the event (R12).

Should the five-year design assessment reveal a UFLS deficiency, the PC shall develop a Corrective Action Plan within five years of the design assessment (R4 and R5).

Appendices

Appendix A – SPP UFLS Plan Contacts

The SPP PC contacts are:

SPP Planning Coordinator

Manager of Reliability Assurance

Subject Matter Expert (SME)

Send email to: ufls@spp.org

Compliance Contact

Compliance Engineer (Planning)

System Protection and Controls Working Group (SPCWG)

Chairman & Staff Secretary

SPCWG Page

Data Transfer

GIS Analyst Transmission Engineering & Modeling

UFLS Data Sharing site (link)

Global Scape Site

↦Compliance and Advanced Studies (CEII, RSD)

↦"Individual TO, DP, and GO by NCR number" (sub-folder)

↦PRC-006

↦Applicable Year

UFLS Model

The current UFLS Model is posted on GlobalScape with location specified in data request.

Access to the models is controlled through CEII. If you require access to these models please contact the UFLS Plan SME in this Appendix.

Appendix B – Schedule for Implementation

SPP Underfrequency Load Shedding (UFLS) Plan Implementation Schedule

The Southwest Power Pool UFLS Plan shall be effective **October 1, 2013**.

Sections 3, 5, 6, 11, 12, and 13 shall be completed by the first day of the first calendar quarter 36 months after Planning Coordinator (PC) notification.

Section 8 shall be completed within one year after the occurrence of any of the following situations:

- Performance characteristic changes to PRC-006 or the SPP UFLS Plan.
- Changes in the total load, which could require a sensitivity study.

Section 9 shall be completed within 60 calendar days from PC notification.

Section 14 shall be completed by SPP within 30 calendar days from a request for data by a PC with its interconnection.

Section 15 shall be completed by the PC and:

- An assessment shall be conducted and documented for the event within one year of event actuation to evaluate the performance of the UFLS equipment and the effectiveness of the UFLS program.
- If UFLS program deficiencies are identified as a result of the islanding event assessment, a UFLS design assessment will be conducted and documented within two years of the event.
- The PC shall provide a Corrective Action Plan and schedule of implementation for the above deficiencies.

Section 20: The PC shall provide the affected UFLS entities a schedule of implementation when a UFLS design assessment has identified a need for a Corrective Action Plan.