A. Introduction

1. **Title:** FRCC Automatic Underfrequency Load Shedding Program.
2. **Number:** PRC-006-FRCC-01
3. **Purpose**: Provide last resort system preservation measures by implementing a Regional Underfrequency Load Shedding (UFLS) program.
4. **Applicability:**

   4.1 Load Serving Entity (LSE) within the FRCC Region

   (LSE with prior actual summer peak demand (integrated hourly) ≥ 25 MW *)

   * contained within a single FRCC UFLS Zone (see appendix B for zone definitions)
5. **Effective Date:** TBD

B. Requirements:

R1. LSEs shall install and maintain UFLS relays in accordance with the following requirements: [Risk Factor: Low]

R1.1. UFLS assignments shall meet the frequency set-points, load percentages and time delays specified in Appendix A of this standard.

R1.2. UFLS assignments shall be made uniformly across the appropriate FRCC UFLS zones defined in Appendix B of this standard. This requirement only applies to LSEs with load serving areas that cross the zonal boundaries as defined in Appendix B.

R1.3. LSE load that is assigned to UFLS steps A, B or C of the schedule as defined in Appendix A of this standard shall not be used as interruptible load [1].

R1.4. Use of distribution level customer load management devices is acceptable on all UFLS assignments and steps. It is not necessary to compensate for these programs and devices when calculating appropriate UFLS assignments.

R2. LSEs shall update and provide UFLS assignment data to the FRCC System Protection and Control Subcommittee (SPCS) on an annual basis. Updates shall be provided to the FRCC by March 31st . [Risk Factor: Low]

R2.1 LSEs may aggregate the reporting of UFLS assignments with other LSEs. When multiple LSEs are reporting their aggregate UFLS assignments, they must notify the FRCC SPCS and designate one of the LSEs as the responsible entity for compliance monitoring and reporting purposes.

R2.2. LSEs or the designated aggregating LSE, where applicable, shall calculate the amount of load armed at each UFLS step on a coincident summer peak basis in accordance with Appendix A of this standard.

R3. Other Frequency activated switching. [Risk Factor: Low]

R3.1. FRCC LSEs, shall report any special frequency initiated switching actions, schemes or systems including auto-restoration schemes. Documentation of these special frequency activated schemes shall be provided to the FRCC whenever changes to the schemes are made or on request.

R3.2. Automatic Restoration of up to 15% of LSE load shed by UFLS is permitted if the frequency is above 59.95 hertz for more than 30 minutes or immediately if the frequency is above 60.3 hertz. For frequencies above 59.95 hertz, LSEs may automatically restore load after the following time delays; 5% of load after 20 minutes, and additional 5% of load after 25 minutes, and an additional 5% of load after 30 minutes.

Note 1 Interruptible Load defined as demand that the end-use customer makes available to its LSE via contract or agreement for curtailment.

C. Measures:

M1. The annual data submittal for each FRCC LSE Entity (reference M2) demonstrates the UFLS installed and in-service in accordance with the frequency set-points, load percentages and time delays specified in Appendix A of this standard.

M2. Each FRCC LSE has annually provided a list of UFLS relay assignments to the FRCC SPCS.

M2.1. LSEs that aggregate the reporting of UFLS assignments with other LSEs shall designate a single LSE responsible for reporting and compliance monitoring purposes and shall communicate this designation to the FRCC SPCS and to the associated LSEs.

M3. Other Frequency Activated Switching:

M3.1. FRCC LSEs, shall provide documentation of special frequency initiated switching systems or schemes within 30 days of scheme modification, or within 30 days of an FRCC request.

M3.2. Automatic load restoration does not exceed load amounts or minimum time delays specified in R3.

D. Compliance:

1. Compliance Monitoring Process

1.1 Compliance Monitoring Responsibility: FRCC

1.2 Compliance Monitoring Period and Reset Timeframe: One calendar year

1.3 Data Retention: The LSE shall retain UFLS assignment data for one year
The Compliance Monitor shall retain any audit data for three years.

1.4 Additional Compliance Information:

LSEs with more than 25 MW of load in the FRCC Region (see applicability section) shall demonstrate compliance through self certification or audit (periodic, as part of targeted monitoring or initiated by complaint or event), as determined by the Compliance Monitor.

2. Levels of Non-Compliance

2.1 Level 1

Documentation of compliance is not provided to the FRCC in a timely manner (within thirty days of request)

2.2 Level 2

The cumulative UFLS assignments do not fall within required range for one of the UFLS steps listed in Appendix A. UFLS load at one station is also armed as interruptible load.

2.3 Level 3

The cumulative UFLS assignments do not fall within required range for two of the UFLS steps listed in Appendix A. The total UFLS armed load is less than the required 56% but is more than 50% of the LSE load (based on projected coincident summer peak load). UFLS load at two or more stations is also armed as interruptible load.

2.4 Level 4

The total UFLS armed load is less than 50% of the LSE load (based on projected coincident summer peak load). The LSE was found level 2 or 3 non compliant in previous year's audit and has not corrected any deficiencies.

Appendix A

FRCC Regional Under-frequency Load Shedding (UFLS) Implementation Schedule:

1. All FRCC Load Serving Entities (LSEs) must install automatic under-frequency relays which will disconnect 56% of their projected summer peak demand (integrated hourly) in accordance with the following schedule. Projected summer peak demand loads shall be based on the FRCC Databank Model as submitted on the most recent FERC 715 filing.

(1) UFLS Step	(2) Frequency (hertz)	(3) Time Delay (seconds) Note (2)	(4) Discrete Block Amount of Load as % of Total LSE Peak System Load (%) Note (3) Amount of Load (% of member system)	(5) Total Cumulative Amount of Load as % of Total LSE Peak System Load (%) Note (3) Cumulative Amount of Load (%)	(6) Acceptable Range for UFLS Load Assignment for Total Cumulative Amount of Load as % of Total LSE Peak System Load (%) Note (4)
A Note (1)	59.7	0.28	9	9	9 -12
B	59.4	0.28	7	16	16 – 19
C	59.1	0.28	7	23	23 - 26
D	58.8	0.28	6	29	29 – 32
E	58.5	0.28	5	34	34 – 37
F	58.2	0.28	7	41	41 – 44
L	59.4	10.0	5	46	46 - 49
M	59.7	12.0	5	51	51 – 54
N	59.1	8.0	5	56	56 - 59

Note 1: FPL has 2/3 of Step A set at 59.82 hertz as an aid to system stability. This high set Step A is concentrated in the Miami area

Note 2: Time Delay = Intentional delay + relay delay + breaker delay

Appendix A (cont)

Note 3: Total LSE peak system load = LSE projected coincident summer peak demand (integrated hourly)

Note 4: UFLS load assignments shall be reported as a percentage of Total LSE peak system load

Note A: Recognizing that it is not possible to make UFLS relay assignments that exactly match the schedule above, the following variances in the load assignments annually reported to the SPCS are permitted:

1) For LSEs with projected summer peak demand greater than 100 MW, the load assigned for each UFLS step must be within the schedule ranges provided in column 6.
2) For LSEs with projected summer peak demand between 25 MW and 100 MW, the load assigned for each UFLS step may deviate from the discrete block amounts prescribed in column 4 and the cumulative ranges provided in column 6 as long as cumulative values meet or exceed the minimum amounts prescribed in column 5. For example, a 100 MW LSE could elect to arm 30 MW of load (30%) at UFLS step A and 26 MW of load (26%) at UFLS Step E.

Appendix B

FRCC Regional Under-frequency Load Shedding (UFLS) Load Shedding Zone Definitions:

The FRCC load shedding zones are defined below in terms of the transmission circuits that form the zone boundary. The intent of these zone definitions is to provide for uniform distribution of UFLS relay assignment through the FRCC Region. These zones are for the most part aligned with the separation points of controlled separation Special Protection System (SPS).

FRCC Northeast Area – Zone 1
The Northeast Florida area east of Suwannee (PEF) and Deerhaven (GRU) stations, north of Silver Springs North (SEC) and Bunnell (FPL) stations and south of Georgia.

FRCC Central Area – Zone 2
The Central and Southwest Florida area south of Ft. White (PEF) station and bounded on the southwest by Orange River (FPL) station and on the southeast by Malabar (FPL) station.

FRCC South Area - Zone 3
The Southeast Florida area south of Zone 2.

FRCC Northwest Area – Zone 4
The Northwest Florida area south of Georgia, east of Gulf Power Co., north of Ft. White (PEF) station and west of Zone 1.

The electrical circuit boundaries between these zones within the FRCC Region are given below.

Zone 1/Zone 2
Hampton-Deerhaven 138 kV
Seminole-Silver Springs N. 230 kV #1&2
Putnam-Tomoka 230 kV
Bunnell-Flagler Beach 230 kV
Bulow-Coquina 115 kV
Crescent City-Hammond Tap 115 kV

Zone 1/Zone 4
Suwannee-Live Oak 115 kV

Zone 2/Zone 3
Orange River-Andytown 500 kV
Orange River-Alva 230 kV
Hendry-Okeelanta 138kV
Whidden-Doorfield 69 kV
Malabar-Hield 230 kV
Malabar-Wyoming 230 kV
Malabar-Palm Bay 138 kV