

WECC

PRC-006-3

Automatic Underfrequency Load Shedding

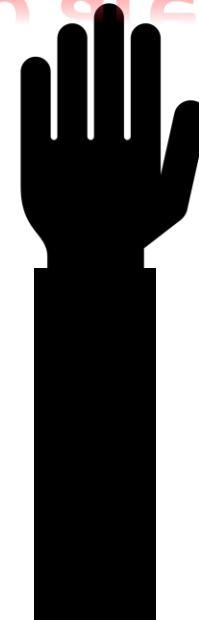
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Topics

- **NERC Standard PRC-006-3**
 - WECC Variance
 - WECC Coordinated Plan
 - PRC-006-WECC-CRT-3
- **Planning Coordinator**
- **UFLS Entities**
 - Applicability and Responsibility
 - Measures and Evidence
 - Internal Controls, Inherent Risk

Who are you?



PRC-006-3

**Applicability, the Variance
and
Requirements with No Variance**

PRC-006-3 Applicability

- **Audit period: PRC-006-1, effective 10/1/2013**
 - WECC Regional Variance (E.B.x)
- **Planning Coordinator**
 - Registered Function
- **UFLS entities**
 - “responsible for ownership, operation, or control of UFLS equipment...”
 - TO, DP

WECC Variance

- **Replaced in their entirety:**
 - R1, R2, R3, R4, R5, R11, R12, and R13
 - Each PC shall “develop”, “document”, “identify”, ...
- **Variance: [D.B.]1, 2, 3, 4, 11, 12**
 - Each Planning Coordinator **shall participate in a joint regional review** with other Planning Coordinators in the WECC Region...that “develop”, “document”, “identify”, ...

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PRC-006	Variance
R1	→ DB1 (PC)
R2	→ DB2 (PC)
R3	→ DB3 (PC)
R4	↘ ↗ DB4 (PC)
R5	
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R11	→ DB11 (PC)
R12	↘ ↗ DB12 (PC)
R13	

No Variance	Function
R6	PC
R7	PC
R8	TO, DP
R9	TO, DP
R10	TO
R14	PC
R15	PC

Requirements with no variance

- **Planning Coordinator**

- R6 – maintain a UFLS database, perform yearly assessment

- R7 – provide its UFLS database to other PCs upon request

- R14 – respond to written comments from UFLS entities

- R15 – Develop Corrective Action Plan(s)

- **UFLS Entities (TO, DP)**

- R8 – Provide data to PC**

- R9 – Provide automatic tripping of load**

- R10 – Provide automatic switching of elements**

Evidence for the Variance

- ***Planning Coordinator***

- *Measures* [M.D.B.x] : “...reports, memorandums, e-mails, program plans, ...

- D.B.1 Participate in review

- D.B.2 Identify Islands

- D.B.3 Adopt coordinated plan**



- D.B.4 Coordinated assessment**

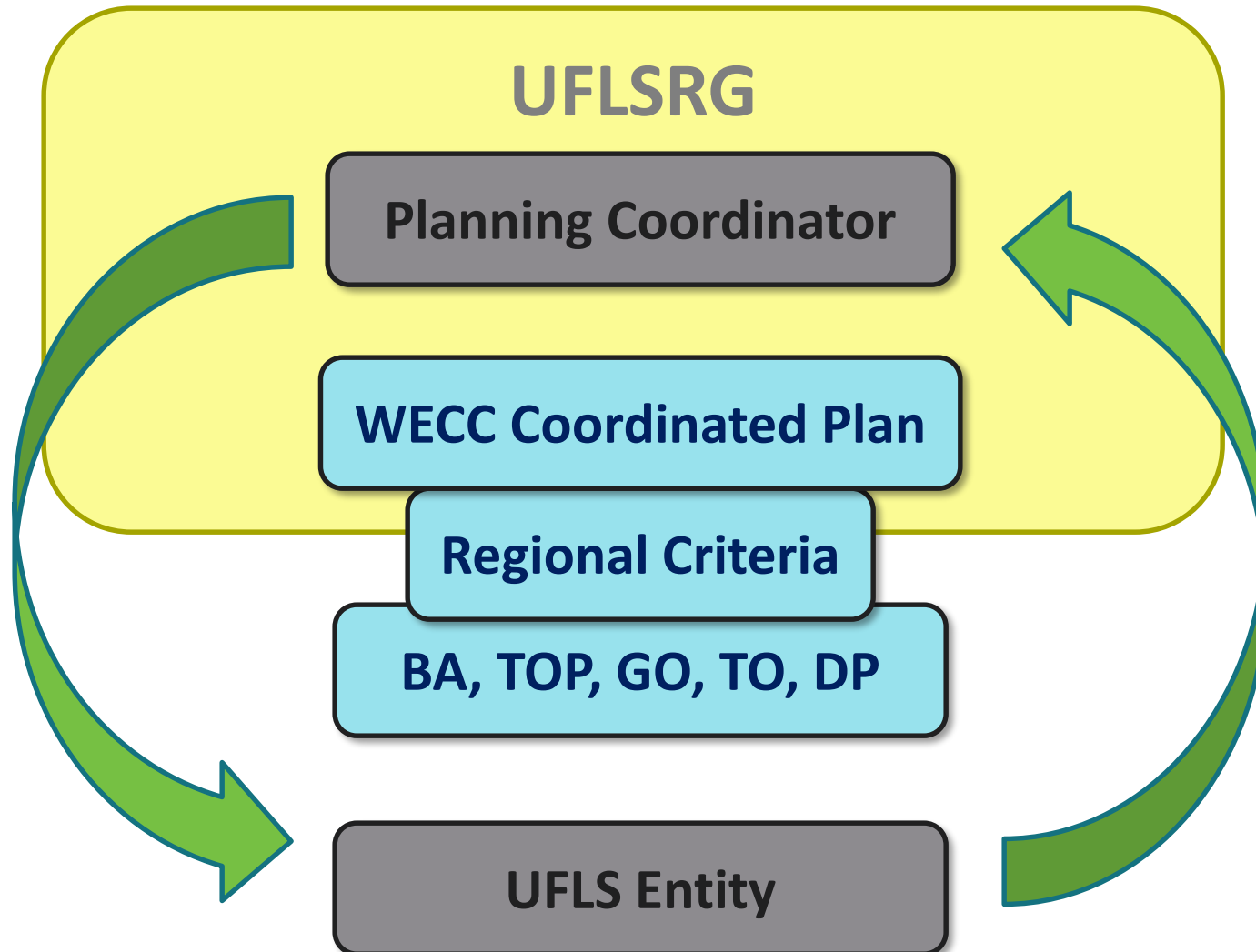
- D.B.11 Islanding event assessment**

- D.B.12 Coordinated event assessment**

PRC-006-3

**The Coordinated Plan
and
Regional Criteria**

The Documentation Challenge



The Coordinated Plan

- ***WECC Off-Nominal Frequency Load Shedding Plan***
 - All PCs in WECC must adopt the Coordinated Plan
 - The Plan depends on the **Regional Criteria**, which are adopted with the Plan.
- ***Plan Objectives: Planning Coordinator***
 - Outline characteristics, describe basis, list reliability and adequacy requirements, define islands, ...
 - **Give it to someone else for implementation**

Schedule and Implementation

- *Variance requirement D.B.3:*
 - *Each Planning Coordinator shall adopt a UFLS program, coordinated across the WECC Regional Entity area, including notification of and a schedule for implementation by UFLS entities within its area*

The Regional Criteria

- ***PRC-006-WECC-CRT-3 – Underfrequency Load Shedding***
 - This defines the **implementation** of the Plan
 - Not applicable to PCs
 - Applicable to ***UFLS Entities***:
 - *entities that are responsible for the ownership, operation, or control of UFLS equipment **as required by the Coordinated Plan.***
 - Includes the BA, TOP, and GO functions.

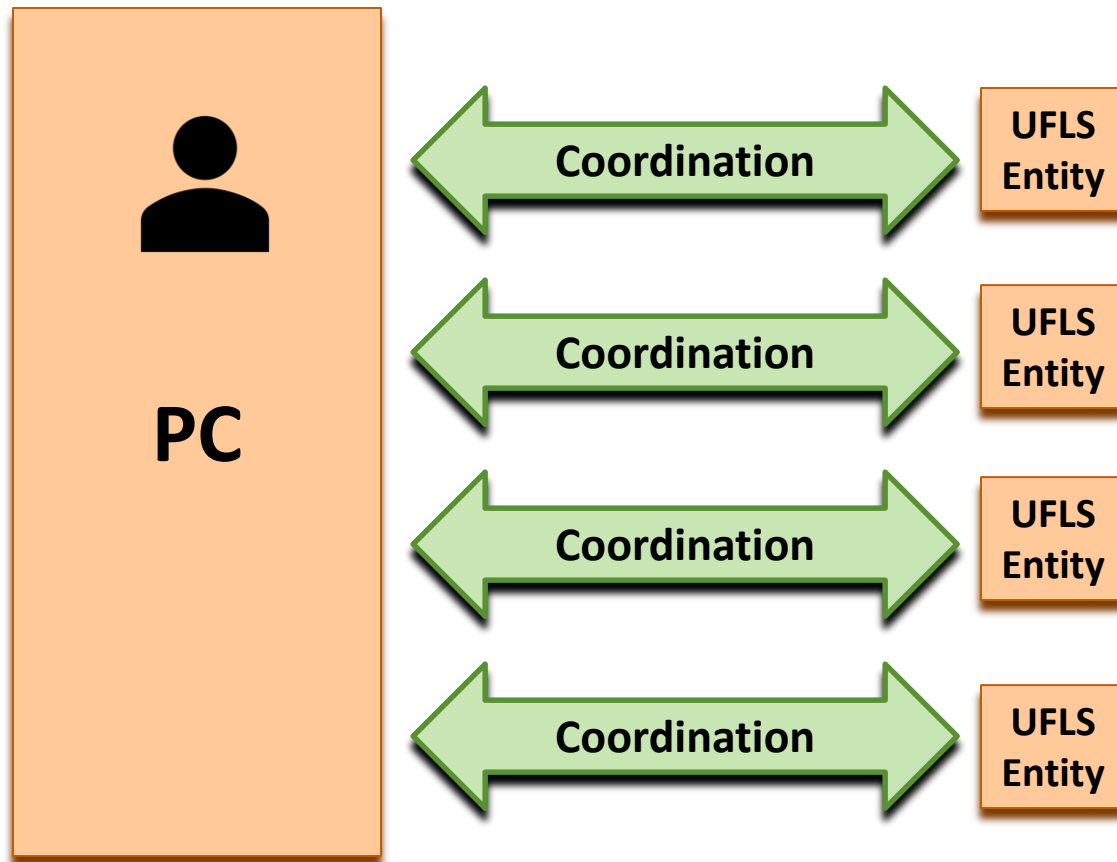
The Regional Criteria

- **Identifies the WECC UFLS Review Group (UFLSRG) as a chartered entity:**
 - Regional group of PC, BA, TOP and TPs
 - Maintains a database
 - Conducts assessments
- **Responsibilities of this and other groups**
 - Non-registered groups acting as agents would not be asked directly to provide evidence.

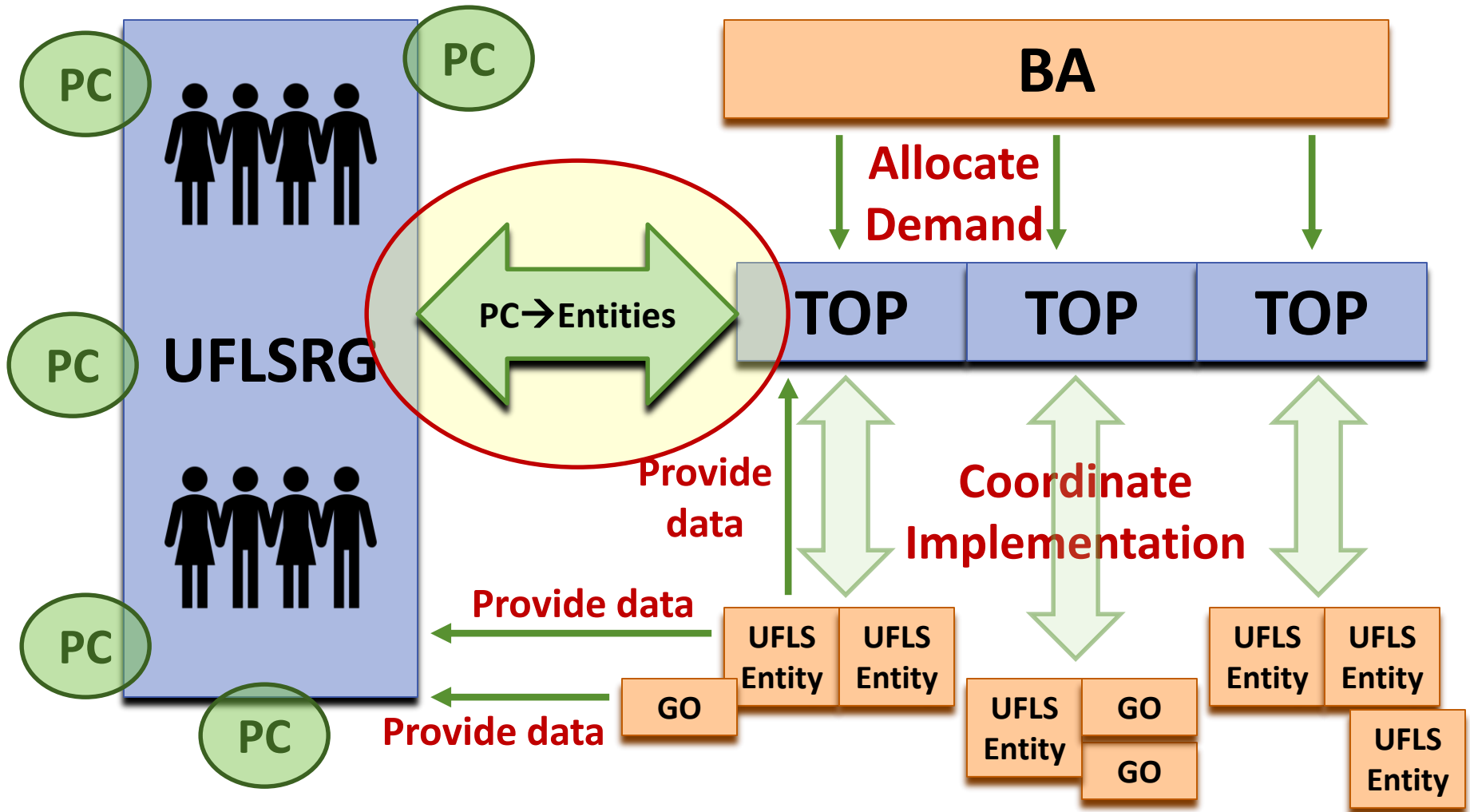
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**Functional Responsibilities
and
Obligations in the Regional Criteria**

Expectations of the Standard



WECC Variance and Criteria



Responsibilities and documentation

- **WR1.**
 - Each **BA** shall annually allocate its BAA Peak Demand **to its respective TOP(s)** based on its previous year's actual BAA Peak Demand, by June 1.
- **Evidence – Documentation**
 - Identification of and allocation to those TOP(s)
 - Annually
 - by June 1

Responsibilities and documentation

- **WR2.**
 - Each **TOP** shall report **to the WECC UFLS Review Group,** and **to each UFLS Entity** connected to its facilities, the sub-area Coordinated Plan(s) it has adopted.
- **Evidence - Documentation**
 - The sub-area plan(s) adopted
 - Reported to the Review Group
 - Identification of and evidence of reporting to each UFLS Entity connected to its facilities

Responsibilities and documentation

- **WR3.**
 - Each **TOP** shall coordinate **with each UFLS Entity** connected to its facilities the implementation of each adopted sub-area Coordinated Plan.
- **Evidence - Documentation**
 - Evidence of implementation is also evidence of coordination (Attachment A)

Responsibilities and documentation

- **WR4.**
 - Each **UFLS Entity** shall communicate **to the Review Group**, the identity of its designated agent (if any), responsible for all data submissions and simulations that are required from the UFLS Entity under the Coordinated Plan.
- **Evidence - Documentation**
 - If no agent designation, and attestation is sufficient
 - Communicated the agent to the Review Group
 - Assignor and assignee agree to the delegation of authority and agency designation.

Responsibilities and documentation

- **WR5.**
 - Each **UFLS Entity** shall provide **to the Review Group** a written report describing:
 - 5.1. The UFLS entity's responsibilities under the Coordinated Plan;
 - 5.2. How the UFLS Entity meets those responsibilities; and,
 - 5.3. Coordinated activities undertaken with other entities to meet the responsibilities under the Coordinated Plan.
- **Evidence - Documentation**
 - The report
 - Provided to the Review Group

Responsibilities and documentation

- **WR6.**
 - Each **UFLS Entity** shall compile its Coordinated Plan data and dynamics file in the WECC-defined format for its entire load and annually, by July 1, submit Attachment A **to the Review Group and to the UFLS Entity's respective Transmission Operator.**
- **Evidence - Documentation**
 - Data was compiled
 - Submitted to the Review Group, respective TOP(s)
 - In the defined format
 - by July 1

Responsibilities and documentation

- **WR7.**
 - Each **UFLS Entity** shall **implement the Coordinated Plan** as documented by the Transmission Operator(s) in WR3.
- **Evidence**
 - ☐ Production reports, list of feeders, settings
 - This would not, necessarily, include maintenance records for the UFLS relays, though they may be used in support.

Responsibilities and documentation

- **WR8.**
 - Each **Generator Owner** shall implement the Coordinated Plan.
- **Evidence**
 - Reports, list of feeders, settings

Responsibilities and documentation

- **WR9.**
 - Each **Generator Owner** shall annually compile and submit **to the Review Group**, no later than June 1, their respective Coordinated Plan data and dynamics file for its generation, in the format ... (Attachment A).
- **Evidence**
 - The data was compiled
 - Submittal to the Review Group
 - In the defined format
 - By June 1

PRC-006-3

**Documentation and Evidence
By Function**

Evidence by Function

- **Planning Coordinator (NERC Standard)**

- Evidence of program adoption (Variance D.B.3)

- Evidence of ongoing performance

- R6 – maintain UFLS database, annually

- R7 – provide UFLS database, upon request

- R14 – respond to written comments from UFLS entities

- R15 – develop CAP and a schedule, per assessments

- D.B.4 5 – perform assessment, annually

- D.B.11 – system islanding event assessment, within 1 year

- D.B.12 – coordinated event assessment, within 2 years

Evidence by Function

- **UFLS Entity (WECC) (WR4, WR5, WR6, WR7)**
 - Agent designation – Assignor and assignee agreement
 - No Agent designation
 - Written report describing responsibilities, how met, and coordinated activities undertaken
 - Compilation of data, submit in defined format:
 - to the Review Group
 - to the TOP(s)
 - by July 1
 - Evidence of implementation

How that evidence meets PRC-006

- **UFLS Entity (NERC) (PRC-006-3 R8, R9, R10)**

- Agent designated – Agreement to designation

- No Agent designation – Attestation to no agent

- Written report describing responsibilities, how met, and coordinated activities undertaken

- Compilation of data, **submit in defined format:**

- to the Review Group

- to the TOP(s)

- by July 1

(R8)



Provide data
to its PC

- Evidence of implementation **(R9, R10)**



Provide automatic
tripping of load
and elements

Evidence by Function

- **Balancing Authority (Regional Criteria)**
 - Dated evidence of annual allocation of BAA Peak Demand
 - to its respective TOPs
 - based on previous year's actual BAA Peak Demand
 - by June 1

Evidence by Function

- **Transmission Operator (Regional Criteria)**
 - Evidence it reported the sub-area Coordinated Plan(s) it has adopted:
 - to the Review Group
 - to each UFLS Entity connected to its facilities
 - Evidence of implementation (Attachment A)

Evidence by Function

- **Generator Owner (Regional Criteria)**
 - compilation of generation data and dynamics
 - evidence of submittal to the Review Group
 - in the defined format
 - by June 1

PRC-006-3

**Risk
And
Internal Controls**

Risk Assessment

Risks addressed by the standard:

- Consistent UFLS design and documentation
- Ability to arrest declining frequency
- Assist recovery of frequency following events
- Provide last resort system preservation measures

Identified Risk

Identified Risks to performance:



- A failure of the assessment process
- A failure to completely implement corrections
- A failure to feed-back accurate data



Inherent Risk

Assessment:

The WECC Coordinated Plan is established and well-studied. The region-wide, coordination process reduces risks that might otherwise be associated with a failure to perform ongoing reviews and corrective actions completely and in a timely manner.

There is a low risk the established coordination or implementation processes would fail to a degree that might warrant an increased risk.

Internal Controls

- The schedule for a group on which you participate.
- Documentation of your functional responsibilities and obligations under the standard, the Coordinated Plan and the Regional Criteria.
- Documentation of the function(s) of the entities with which you coordinate.
- A schedule for coordination and providing data, based on your functional registrations.
- Review prior coordination and reporting periodically for completeness.

Questions?



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