

When completed, email to: [gerry.cauley@nerc.net](mailto:gerry.cauley@nerc.net)

## Standard Authorization Request Form

Title of Proposed Standard	Frequency Response
Request Date	4/7/04

SAR Requestor Information	SAR Type (Put an 'x' in front of one of these selections)	
Name Don McInnis	<input checked="" type="checkbox"/>	New Standard
Primary Contact Don McInnis	<input type="checkbox"/>	Revision to existing Standard
Telephone (305) 442-5272 Fax	<input type="checkbox"/>	Withdrawal of existing Standard
E-mail don_mcinnis@fpl.com	<input type="checkbox"/>	Urgent Action

### Purpose/Industry Need (Provide one or two sentences)

In regard to frequency response, one shortcoming of the recommendations in policy today is that there is no guidance regarding how much governor response (in MW) is required at the 5% droop rate. This has led to confusion among plant operators and turbine-generator manufacturers alike, and has led to confusion among CA and Generation Operators as to their responsibilities and obligations.

This SAR is suggested to ensure frequency of Interconnection remains above underfrequency load shedding setpoints during transient period following the sudden loss of generation on the Interconnection.

## Reliability Functions

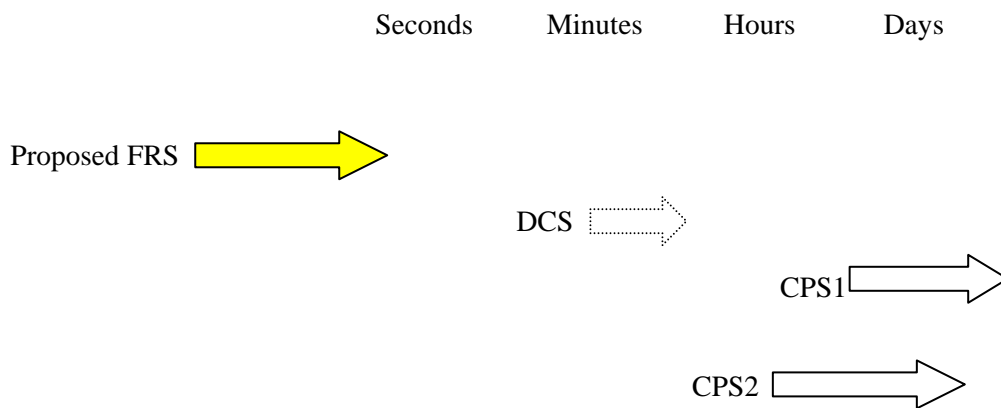
The Standard will Apply to the Following Functions (Check box for each one that applies by double clicking the grey boxes.)		
X	Reliability Authority	Ensures the reliability of the bulk transmission system within its Reliability Authority area. This is the highest reliability authority.
<input checked="" type="checkbox"/>	Balancing Authority	Integrates resource plans ahead of time, and maintains load-interchange-resource balance within its metered boundary and supports system frequency in real time
<input type="checkbox"/>	Interchange Authority	Authorizes valid and balanced Interchange Schedules
<input type="checkbox"/>	Planning Authority	Plans the bulk electric system
<input type="checkbox"/>	Resource Planner	Develops a long-term (>1year) plan for the resource adequacy of specific loads within a Planning Authority area.
<input type="checkbox"/>	Transmission Planner	Develops a long-term (>1 year) plan for the reliability of transmission systems within its portion of the Planning Authority area.
<input type="checkbox"/>	Transmission Service Provider	Provides transmission services to qualified market participants under applicable transmission service agreements
<input type="checkbox"/>	Transmission Owner	Owens transmission facilities
<input type="checkbox"/>	Transmission Operator	Operates and maintains the transmission facilities, and executes switching orders
<input type="checkbox"/>	Distribution Provider	Provides and operates the “wires” between the transmission system and the customer
<input type="checkbox"/>	Generator Owner	Owens and maintains generation unit(s)
<input checked="" type="checkbox"/>	Generator Operator	Operates generation unit(s) and performs the functions of supplying energy and Interconnected Operations Services
<input type="checkbox"/>	Purchasing-Selling Entity	The function of purchasing or selling energy, capacity and all necessary Interconnected Operations Services as required
<input type="checkbox"/>	Market Operator	Integrates energy, capacity, balancing, and transmission resources to achieve an economic, reliability-constrained dispatch.
<input type="checkbox"/>	Load-Serving Entity	Secures energy and transmission (and related generation services) to serve the end user

## Reliability and Market Interface Principles

<b>Applicable Reliability Principles</b> (Check boxes for all that apply by double clicking the grey boxes.)	
<input checked="" type="checkbox"/>	1. Interconnected bulk electric systems shall be planned and operated in a coordinated manner to perform reliably under normal and abnormal conditions as defined in the NERC Standards.
<input type="checkbox"/>	2. The frequency and voltage of interconnected bulk electric systems shall be controlled within defined limits through the balancing of real and reactive power supply and demand.
<input type="checkbox"/>	3. Information necessary for the planning and operation of interconnected bulk electric systems shall be made available to those entities responsible for planning and operating the systems reliably.
<input type="checkbox"/>	4. Plans for emergency operation and system restoration of interconnected bulk electric systems shall be developed, coordinated, maintained and implemented.
<input type="checkbox"/>	5. Facilities for communication, monitoring and control shall be provided, used and maintained for the reliability of interconnected bulk electric systems.
<input type="checkbox"/>	6. Personnel responsible for planning and operating interconnected bulk electric systems shall be trained, qualified and have the responsibility and authority to implement actions.
<input checked="" type="checkbox"/>	7. The security of the interconnected bulk electric systems shall be assessed, monitored and maintained on a wide area basis.
<b>Does the proposed Standard comply with all of the following Market Interface Principles?</b> (Select 'yes' or 'no' from the drop-down box by double clicking the grey area.)	
1.	The planning and operation of bulk electric systems shall recognize that reliability is an essential requirement of a robust North American economy. Yes
2.	An Organization Standard shall not give any market participant an unfair competitive advantage. Yes
3.	An Organization Standard shall neither mandate nor prohibit any specific market structure. Yes
4.	An Organization Standard shall not preclude market solutions to achieving compliance with that Standard. Yes
5.	An Organization Standard shall not require the public disclosure of commercially sensitive information. All market participants shall have equal opportunity to access commercially non-sensitive information that is required for compliance with reliability standards. Yes

**Detailed Description** (Provide enough detail so that an independent entity familiar with the industry could draft, modify, or withdraw a Standard based on this description.)

This proposed standard would coordinate with and complement the Load and Balancing SAR, which addresses Interconnection frequency control from 10 minutes and longer, by addressing the requirements for control during the seconds timeframe. Ideally, an integrated set of performance-based “balancing standards” should be in place that monitors the entire spectrum of the adequacy component of reliability. Figure 1 depicts the interrelationships of the set of “Balancing” standards, which ultimately checks that Control Areas have and deploy adequate resources to maintain reliability.



**Figure 1 Interrelationships of "Balancing" Standards**

The Control Performance Standards (CPS1 and CPS2) are well-defined and generally accepted by the Industry. The Disturbance Control Standard (DCS) measures deployment of reserves for specific events. This SAR is proposed to develop a standard to measure sub-minute responses to changes in frequency and to set minimum acceptable responses to system these events.

A Frequency Response Standard should address the following issues:

- There must be a minimum response for each event (rate, amount, and duration). Reliance on average response could result in all areas being short at the same time (similar to the short-term excursions seen with CPS1). The amount (depth of response) should not be under-emphasized.
- The measurement selected must be accurate and, to the extent practical, easy to implement.
- The requirements must integrate with and be consistent with the assumptions used in setting the BAAL limits within the Load and Balancing Standard (if and as ultimately adopted)
- A method of allocation must be developed
- The standard should not preclude market solutions (e.g. allow purchasing of response as long as deliverability and restoration criteria can be met). There must be a means for sale/purchase of frequency response as for any other quantity.

**Related Standards**

Standard No.	Explanation
300	Address frequency control during the transient period of 1-30 seconds currently not covered by the Balance Resource and Demand Standard

**Related SARs**

SAR ID	Explanation

**Regional Differences**

Region	Explanation
ECAR	
ERCOT	
FRCC	
MAAC	
MAIN	
MAPP	
NPCC	
SERC	
SPP	
WECC	

**Related NERC Operating Policies or Planning Standards**

ID	Explanation
Planning Standards III Section C Generation Control and Protection	The planning standards address the requirement for generator governors. This proposed standard broadens the concept to include not only governors but other equipment including load that responds to frequency.
