

***Resolution Urging Generators to Take Corrective Action  
and Implement Primary Frequency Response***

**WHEREAS**, The Bulk Electric System (BES) must constantly maintain a balance of generation and customer load in order to function reliably and predictably; *and*

**WHEREAS**, Changes in the balance of generation and customer load cause changes in frequency from nominal (60 Hz or 60 cycles per second); *and*

**WHEREAS**, Balancing Authorities in North America strive to maintain frequency at 60 Hz, and must maintain frequency within pre-defined acceptable limits in order to avoid under-frequency load shedding that would cause the loss of customer load; *and*

**WHEREAS**, “Primary frequency response” is provided by generators that automatically increase their output in response to an under-frequency event (*i.e.*, where generation is less than customer load) or automatically decrease their output in response to an over-frequency event (*i.e.*, where generation is greater than customer load); *and*

**WHEREAS**, Historically, BES generators (along with load damping) have stabilized the generation/load balance automatically by providing primary frequency response within 1 to 20 seconds; *and*

**WHEREAS**, The overall primary frequency response in the Eastern and Western Interconnections has declined over the past two decades; *and*

**WHEREAS**, It has been discovered that the primary frequency response provided by many interconnected generating units does not occur, or is being prematurely withdrawn, before the grid returns to the desired frequency; *and*

**WHEREAS**, While this decline in primary frequency response does not currently pose a widespread reliability risk, it could impact the ability of the BES to recover from consecutive system events; *and*

**WHEREAS**, Adequate primary frequency response must be delivered and sustained in order to accomplish system restoration if the BES were to experience a widespread blackout; *and*

**WHEREAS**, The North American Electric Reliability Corporation (NERC) is charged with monitoring the BES and has, in turn, charged its Resources Subcommittee to investigate the cause of the decline in primary frequency response and to understand the implications of a continued decline in primary frequency response; *and*

**WHEREAS**, On January 17, 2005, the Resources Subcommittee highlighted the importance of the issue when it published recommendations stating, “both the Western and Eastern Interconnections run a strong risk of under-frequency action [*i.e.*, load shedding] if a standard is not adopted that establishes minimum levels of frequency response”; *and*

**WHEREAS**, Recently the Resources Subcommittee, through the efforts of the Frequency Working Group and the Eastern Interconnection Frequency Response Initiative, conducted generator surveys and generator manufacturer interviews and determined that the root causes of the primary frequency response decline can be traced to: 1) generator governor dead-band settings exceeding the recommended range; and 2) plant or generator control logic prohibiting or prematurely withdrawing primary frequency response; *and*

**WHEREAS**, These two root causes are so pervasive that in the Eastern Interconnection, NERC found in the *2012 NERC Frequency Initiative Report* from a study performed by the Multiregional Modeling Work Group that, “only 30% of the units on-line provide primary frequency response; Two-thirds of the units that did respond exhibit withdrawal of primary frequency response; only 10% of the units on-line sustained primary frequency response”; *and*

**WHEREAS**, On February 5, 2015, NERC published an Alert Advisory stating that the causes of the primary frequency response decline are: 1) generator governor dead-band settings exceeding the recommended range; and 2) plant or generator control logic prohibiting or prematurely withdrawing primary frequency response; *and*

**WHEREAS**, On September 28, 2015, NERC posted for comment a *Draft Reliability Guideline: Primary Frequency Control*, that described these findings relative to the cause of the decline in primary frequency response and identified simple and cost-effective corrective measures that generators can take; *and*

**WHEREAS**, Several entities have voluntarily initiated a comprehensive program to address inadequate or lack of primary frequency response; *and*

**WHEREAS**, However, all entities in all interconnections need to, or should continue to address: 1) generator governor dead-band settings exceeding the recommended range; and 2) plant or generator control logic prohibiting or prematurely withdrawing primary frequency response; *now, therefore be it*

**RESOLVED**, That the National Association of Regulatory Utility Commissioners, convened at its 127th Annual Meeting in Austin, Texas, hereby 1) encourages Generation Owners and Generator Operators to pursue voluntary correction of this issue to improve primary frequency response; and 2) encourages associated entities such as Balancing Authorities to support Generator Owners and Generator Operators to improve primary frequency response.

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*Sponsored by the Committee on Electricity and the Committee on Critical Infrastructure  
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