**Industry Advisory**

**Generator Governor Frequency Response -**

**Eastern Interconnection**

Initial Distribution: January 5, 2015

**As a result of the Eastern Interconnection Frequency Initiative, the NERC Resource Subcommittee has determined that a significant portion of the Eastern Interconnection generator dead bands and/or governor control settings inhibit frequency response or in some case would only provide response under extraordinary conditions. The proper setting of dead bands, droop and other controls to allow for primary frequency response is essential for reliability of the Bulk Electric System and critical during system restoration. Further, the accuracy of Transmission Planning models are impacted with incorrect governor data. The purpose of this Advisory is to alert the industry of recommended governor dead band and droop settings that will enable generators to provide frequency response needed for the reliable operation of the Bulk Electric System.**

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| **Primary Interest Groups:** | Generation Engineering, Generator Owner, Generation Operations, System Operators, Transmission Planning |

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| **Advisory:** | With exception of nuclear generators, all Recipients of this Advisory with generating resources with gross plant/ facility aggregate nameplate rating greater than 75 MVA should review generator governor settings and ensure dead bands do not exceed +/- 36 mHz, droop setting does not exceed 5%, and that governors are functioning and are able to provide frequency response, unless a technical or operational justification exists for exceeding the advised dead band setting.  A growing number of generator governor controls are contained in the associated turbine control system. Typically these functions are referred to as speed control and reference turbine speed in rpm. Entities should review these turbine controls and settings to ensure they are providing the desired governor response with a maximum 36 mHz deadband and a droop characteristic not exceeding 5%. |
| **Background:** | The NERC Resource Subcommittee has reviewed the generator data submitted in the Eastern Interconnection Frequency Response Survey as well as the 2010 NERC Alert Generator Survey and determined that many generator owner and/or operators failed to provide their generator governor dead band or droop settings because they may lack the resources or knowledge to determine that information. A number of generators owners or operators submitted dead bands in excess of 50 mHz to nearly 300 mHz. Several Generator Owners/ Operators have reported an OEM governor type with multiple dead band setting configurations with one dead band setting under normal operations at 252 mHz.  Accurate dead band and droop information and proper settings are important to the reliability of the BES, System Restoration and Transmission Planning models.  Excluding nuclear generators, NERC encourages Generator Owners and Operators to work in conjunction with their Balancing Authority to modify generator governor dead band settings that currently exceed 36 mHz to be set no greater than 36 mHz with droop settings no greater than 5%, with a continuous, proportional (non- step) implementation of response. Assure that appropriate outer- loop controls are in place to avoid primary frequency response early withdrawal. Further, Generator Owners and Operators should ensure that governors are functional and are capable of providing frequency response. Finally, as generator dead band and droop settings are determined or modified, Generator Owners and Operators are requested to communicate those settings and other important governor control system data to its Balancing Authority and Transmission Planning Authority.  NERC encourages Generators Owners and Operators to collaborate with the North American Generator and Transmission Forum, industry trade associations, and/ or original equipment manufacturer for support in determining governor dead band and droop settings, and if applicable, how to perform modifications to governor settings and frequency response input into generator control logic. |
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