

# **Monitoring frequency control in the Turkish power system**

E. Lobato Miguélez; I. Egido Cortés; L. Rouco Rodríguez

## **Abstract-**

Frequency control is a key ancillary service for the secure and reliable operation of power systems, and especially in isolated power systems such as Turkey which is not yet synchronously connected to the UCTE European system. Frequency control has been defined in the Turkish Power System as a mandatory remunerable ancillary service that is provided by generating units and managed by the system operator. This paper develops a centralized monitoring system of frequency that informs the System Operator if the generating units comply with the technical requirements of the Turkish grid code. The system consists of a reference model that validates the real operation of the primary and secondary regulation of the generating units comparing it with the desired behavior established by the technical requirements of the Turkish grid code. A number of quantitative measures, based on the deviation between the real and the desired response are proposed to evaluate the adequacy of each unit behavior. Application examples of the proposed monitoring system of frequency control are provided using real data of different Turkish power plants.

**Index Terms-** ancillary services, frequency control, monitoring system.

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