

## **New design for the Spanish AGC scheme using an adaptive gain controller**

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### **Abstract-**

**This paper investigates the application of adaptive control to the Spanish load-frequency regulation scheme, Automatic Generation Control (AGC). The Spanish AGC system regulates the frequency and the power exchange between France and Spain. The system is hierarchically structured with one master regulator that coordinates four control areas. Each control area is composed of several generating units providing AGC service. Coordinating signals are sent to the control areas so that the global system response achieves the objective established by the System Operator. The participation of each control area in the service is set according to the rated share that it has obtained in the secondary-reserve market and its relative response speed compared to that of the rest of the control areas. Some problems, such as the lack of sensitivity to the quality of the reserve provided by the control areas, have been detected in the operation of the current AGC scheme. A new design, which is presented in this paper, has been developed in order to overcome these problems. This paper attempts to outline how this new design improves the global AGC system response and the distribution of the regulation effort among the control areas. The proposed strategy is compared with the present design by means of simulation.**

**Index Terms-** AGC, Adaptive control, Automatic Generation Control, load-frequency regulation, system identification

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