ABSTRACT

In the current scenario of power systems, with the increase in need for the availability of power to meet all types of loads, there is equal demand for quality power. The day is demanding power with no fluctuations and with stable, reliable power at all times. Hence, to maintain quality power and to meet the current reforms in the power sector and to accommodate the variations in demand of industrial sector thereby the variations in the frequency, one controller is essential.

Due to the frequency variations, there would be loss of stability of the system, if proper control is not made. The most and foremost important component in power system is the secondary controller.

Based on various researches made in the load frequency control area, performance of various types of controllers used as load frequency controller has been studied. It is observed that certain crisis such as damping oscillations, long settling time and maximum overshoot of frequency, chattering have been observed.
In the current research, in order to overcome the above problems and to improve the steady state value, Load frequency Controller has been designed for two area hydro thermal power system. The researcher has analysed the performance of the single area single source and two areas with two sources with only primary control and with no secondary controller. The researcher also has implemented PI controller as the secondary controller along with the Primary control in the two area two source system with Thermal and Hydro power as sources.

An advanced model of a hybrid controller has been designed. The proposed hybrid controller for two area two source system is Fuzzy logic controller (FLC) plus proportional double integral controller. The performance of the designed controller along with primary control in the two area two source system with hydro power & thermal power as sources is good. It has fast settling time when compared with PI controller.

Another controller namely Fuzzy logic controller plus PI controller has been designed and applied to the hybrid generator network with two hybrid sources namely PV System and Diesel generator in the two areas. The researcher has designed hybrid generator network and implemented the designed FLC plus PI controller and performance is analysed. The performance of the system with only FLC controller, only PI controller and FLC & PI controller has been analysed.
In order to ascertain the performance of the designed controller namely Fuzzy logic controller (FLC) and proportional double integral controller proposed for two area two source system with hydro power & thermal power as sources, it is proposed to extend to the two area system with PV panel and Diesel Generator as sources of power.

The performance of the Fuzzy logic controller (FLC) and proportional double integral controller is good with faster settling time when compared to the other controllers in respect of PV panel and Diesel Generator system also.

Thus, this research work has made its focus on the methods for load frequency control in two area multi source system with thermal power, hydro power, solar Power and diesel power as different types of sources of power and performance of the designed controllers is analysed.