Design and Application of Distributed Control System of Power Plant

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ABSTRACT

As the high industrialization and improved quality of people's lives, there has been an increasing demand of electric power. Since the rate of building new power plants cannot meet such a huge requirement, the shortage of electric power has become worse and worse. Therefore, the Ministry of Economic Affairs decided to promote the development of cogeneration system, and announced "the promotion of cogeneration systems regulation" in July 15, 1988. The regulation stated that all the extra power generated by registered companies could be bought back by the Taiwan Power Company. For encouragement purpose, the Taiwan Power Company was also obligated to provide the required power to those registered companies during periods of their machine maintenance.

The control system of a cogeneration power plant consists of the main control unit and the auxiliary unit. The former is usually implemented by the distribution control system (DCS), while the latter is implemented by the programmable logic controller(PLC). The co-existence of such two different systems could lead to the communication and maintenance problems.

This paper describes the development of a control system of a cogeneration power plant, which utilizes the DCS to control both the main control unit and the auxiliary unit. Such integration provides users with features of distributed control and centralized management for automatic control. In addition to reducing cost and time, our approach also allows the user to modify the control procedure with more flexibility and easy extension. With the help of such an integrated control system, the expenditure in human, material and financial resources of a company will be reduced.

Keywords : cogeneration systems、distributed control system、programmable logic control

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