Abstract

With the advancement of technology and open access of transmission services, the power flows over the transmission lines has become unprecedented and increased many fold, which causes the power system to work under the stressed operating conditions. So for the reliable, safe and required degree of quality of power supply, the ancillary services have come into being under deregulated environment. These services provide the support to transmission of power in interconnected grids. Out of seven major ancillary services, (black start, frequency regulation, system protection, scheduling and dispatch, reactive power and voltage regulation and load balancing), this paper deals with the reactive power and voltage regulation. The reactive power regulation is used to keep the voltage within its limits and improves the voltage profile, which
A Load Flow based Approach for Reactive Power Evaluation in Deregulated Power Systems

has become a major concern in present day power system operation. It becomes very important to ensure the presence of sufficient amount of reactive power source in the network for secure and reliable operation of electrical power system. In this paper, the reactive power procurement from various generating sources has been evaluated under specified transactions with the aid of load flow analysis program. The proposed methodology has been tested on two sample power systems. The results obtained show that the proposed method is able to maintain voltage profile at load buses by procuring reactive power from available generation resources.

References

- A. R. Abhyankar and S. A. Khaparde, Introduction to deregulation in power industry, available [online] www.nptel.ac.in
- I. E. Samahy, K. Bhattacharya, C. Canizares, M. F. Anjos and J. Pan, A procurement market model for reactive power services considering system security, IEEE TRANSACTIONS ON POWER SYSTEMS, 23 (2008)
- R. Staniulis, Reactive power valuation, Department of Industrial Electrical Engineering and Automation, Lund University (2001)
- K. Singh, N. P. Padhy, and J. D. Sharma, Social welfare maximization considering reactive power and congestion management in deregulated Environment, Int. jour. electric power components and systems, 38, (2010), pp. 50-71

Index Terms

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