TRACING GENERATORS' OUTPUT IN TRANSMISSION OPEN ACCESS

Abstract

Over the past few years, the electric power utility industries around the world have experienced a strong drive towards deregulation. Based on the experience of deregulation of the communication, natural gas and airline industries, the deregulation of electric utilities is necessary for high efficiency and energy saving. In developed countries, after decades of government regulation and protection, the traditional vertical integrated electric utilities have been criticized as ineffectively monopoly sectors. Customers have to pay expenses to utilities due to low efficiency operation and improper policy. However, deregulation may bring fair pricing and open access to all users. Regardless of market structure, it is important to know the contribution of particular generator to particular load and line flow. Due to nonlinear nature of power flow, it is difficult to determine transmission usage in the network accurately. Thus, models and tracing algorithms will become very heuristic in order to allocate the power flow and loss in transmission networks. This paper discussed a method for tracing the power flow and loss in the deregulated transmission system. Based on converged load flow, basic circuit theories including superposition theory, equivalent impedance and equivalent current injection are applied in developing this method. Then, the voltages, currents, power flows and losses contributed by every generator in the system could be traced. An IEEE-14 bus test system has been used and the results found to be effective in testing this method. Result comparisons of previous method is also been discussed.