

Realtime Simulation Technology for Power Market

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The deregulation of electric power in Japan started in 1995 from whole sale market (IPP: Independent Power Producer). In 2000, large customers with a total demand of 2000kw or more and voltage of 20kv or higher were allowed to choose the electricity supplier. Further deregulation, active wholesales market through power exchange are established.

Application of realtime simulation technology enable flexible and reliable power market. For the physical trading in the power exchange, available transmission capacity (ATC) should be considered to manage the possible congestion. Realtime (or even super-realtime) simulation can be used to evaluate thousands of cases with various alternatives.

Realtime simulation also can be applied to control center as online security monitoring function. This enables flexible operation against unexpected changes. Also the realtime simulation is effective for training of dispatchers and traders.

Thanks to the evolution of computer and network technology, realtime simulator of power system is now available with reasonable cost. For example, PC-cluster using ordinal personal computers and off-the-shelf high-speed network provide a low-cost hardware.

This paper first discuss the current state of deregulation, and the requirement for power system simulation. Then it introduces various simulation technologies with software method and hardware implementation. Finally, it introduces the experience of implementation of such simulation technology and future possible applications.