

The Determination of Operating Reserve in Small Power Systems Based on Reliability Criteria

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Abstract : This paper focuses on determination of total Operating Reserve (OR) level, consisting of spinning and non-spinning reserves, in two small real power systems, in such a way that the system reliability indicator would comply with typical industry standards. For this purpose, the standard used by the North American Electric Reliability Corporation (NERC) - i.e., 1 day outage in 10 years or 0.1 days/year is relied. The simulation of system operation for these systems that was used for the determination of total operating reserve level was performed by industry standard production simulation software in this field, named PLEXOS. In this paper, the operating reserve which meets an annual Loss of Load Expectation (LOLE) of approximately 0.1 days per year is determined in the study year. This reserve is the minimum amount of reserve required in a power system and generally defined as a percentage of the annual peak.

Keywords : frequency control, LOLE, operating reserve, system reliability

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