

Dynamic Self-Scheduling of Pumped-Storage Power Plant in Energy and Ancillary Service Markets Using Sliding Window Technique

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Abstract : In the competitive electricity market environment, the profit of the pumped-storage plant in the energy market can be maximized by operating it as a generator, when market clearing price is high and as a pump, to pump water from lower reservoir to upper reservoir, when the price is low. An optimal self-scheduling plan has been developed for a pumped-storage plant, carried out on weekly basis in order to maximize the profit of the plant, keeping into account of all the major uncertainties such as the sudden ancillary service delivery request and the price forecasting errors. For a pumped storage power plant to operate in a real time market successive self-scheduling has to be done by considering the forecast of the day-ahead market and the modified reservoir storage due to the ancillary service request of the previous day. Sliding Window Technique has been used for successive self-scheduling to ensure profit for the plant.

Keywords : ancillary services, BPSO, power system economics, self-scheduling, sliding window technique

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