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Impact of risk aversion on the operation of hydroelectric reservoirs in the presence of renewable energy sources

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Abstract-

The increasing share of renewable energy sources, such as wind and solar generation, has a direct impact on the planning and operation of power systems. In addition, the consideration of risk criteria within the decision support tools used by market participants (generation companies, energy services companies, and arbitrageurs) is becoming a common activity given the increasing level of uncertainties faced by them. As a consequence, the behavior of market participants is affected by their level of risk aversion, and the application of equilibrium-based models is a common technique used in order to simulate their behavior. This paper presents a multi-stage market equilibrium model of risk-averse agents in order to analyze up to what extent the operation of hydro reservoirs can be affected by the risk-averse profile of market participants in a context of renewable energy source penetration and fuel price volatility.

Index Terms- market equilibrium; risk-averse agents; hydrothermal coordination; renewable energysources (RES) penetration

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