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A medium-term integrated risk management model for a hydrothermal generation company

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Abstract-

This paper presents a methodology to manage the market risk faced by a hydrothermal generation company in the medium-term (one year). This risk is due to uncertainty in fuel prices, power demand, water inflows, and electricity prices. The proposed methodology includes three steps: the generation of scenarios for these random parameters, the approximation of these scenarios by a multivariate scenario tree, and the optimization of the company’s operational and financial hedging decisions under a stochastic programming framework. The optimization model permits the representation of a diversified generation portfolio and measures risk exposure by means of conditional value-at-risk. A realistic numerical example is solved to illustrate the possibilities of our approach.

Index Terms- Conditional value-at-risk, generation operation planning, integrated risk management, risk analysis, stochastic optimization.

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