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Agent-based global energy management systems for the process industry. (English)

Zbl 1359.90051

Rebennack, Steffen (ed.) et al., Handbook of power systems. I. Berlin: Springer (ISBN 978-3-642-02492-4/hbk; 978-3-642-02493-1/ebook). Energy Systems, 429-450 (2010).

Summary: Energy utility systems are typically responsible for satisfying internal customers (e.g., the various process plants in the industrial complex). The increasing independence of business units in the complex matches an emerging trend in the utility systems to operate for own economic viability and for the encouragement to trade with both internal and external customers. The paper presents a dynamic management system supporting autonomy and the optimal operation of the utility system. The management system comprises three functional components, which support negotiation, short-term (tactical) and long-term (strategic) optimisation. The negotiation component involves an agent-based system exploiting the knowledge base established with real-time and historical data, whereas the optimisation provides a primal front (operational changes) and background front (structural changes) to account for the tactical and strategic decisions.

For the entire collection see [Zbl 1201.00002].

MSC:

90B50 Management decision making, including multiple objectives
90B15 Stochastic network models in operations research

Keywords:

off-line decision support; multilevel optimization; multiagent system; negotiation; online decision support; utility system

Software:

JADE

Full Text: DOI

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