Event-based scheduling of industrial technical virtual power plant considering wind and market prices stochastic behaviors - A case study in Iran

Rahmat-Allah Hooshmand, Seyyed Mostafa Nosratabadi, Eskandar Gholipour

PII: S0959-6526(17)32947-5
DOI: 10.1016/j.jclepro.2017.12.017
Reference: JCLP 11412

To appear in: Journal of Cleaner Production

Received Date: 17 July 2017
Revised Date: 25 November 2017
Accepted Date: 2 December 2017


This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.
Event-Based Scheduling of Industrial Technical Virtual Power Plant Considering Wind and Market Prices Stochastic Behaviors - A Case Study in Iran

Rahmat-Allah Hooshmand¹*, Seyyed Mostafa Nosratabadi², Eskandar Gholipour¹

hooshmand_r@eng.ui.ac.ir, sm.nosratabadi@sirjantech.ac.ir, e.gholipour@eng.ui.ac.ir

¹Department of Electrical Engineering, Faculty of Engineering, University of Isfahan, Isfahan, Iran
²Department of Electrical Engineering, Sirjan University of Technology, Sirjan, Iran

*Corresponding Author: Tel. +98-31-37934073, Fax: +98-31-37933071, Email: hooshmand_r@eng.ui.ac.ir

Abstract: The Virtual Power Plants containing Distributed Energy Resources are classified into two main categories of Commercial Virtual Power Plant and Technical Virtual Power Plant as a suitable way to manage industrial environments. Here, Industrial Technical Virtual Power Plant is defined as a scheduling unit containing loads and generations located in an industrial grid. A comprehensive framework is proposed here for normal and contingency conditions for various Virtual Power Plants participating in a short-term market. This framework performs a day-ahead and intra-day generation scheduling by selecting the best Demand Response programs. In this framework, the wind generations and the day-ahead and intra-day electricity market prices are considered as the stochastic parameters. A risk-management aspect is noticed in the proposed stages for contingency conditions. Then, some element changes such as seasonal load change and single-line outage are trained in the system to accredit the proposed solution in the contingency condition. Hereof, an appropriate technique is defined to represent the proposed model and solution. To specify the effectiveness and efficiency of the proposed methodology, the modified Isfahan Regional Electric Power Company network in Iran is experimented to test the method and to assess some encouraging aspects as well. By the proposed approach, attractiveness of Demand Response programs is revealed in industrial grids and the lower cost will be imposed. Also the improvement percentage of load shedding can be gained by performing the proposed scheduling that is so important for industrial processes.

Keywords: Demand Response; Industrial Technical Virtual Power Plant; Risk Management; Seasonal Load Contingency; Stochastic Wind Power; Virtual Power Plant Scheduling Simulation.
دریافت فوری متن کامل مقاله

امکان دانلود نسخه تمام متن مقالات انگلیسی
امکان دانلود نسخه ترجمه شده مقالات
پذیرش سفارش ترجمه تخصصی
امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
امکان دانلود رایگان ۲ صفحه اول هر مقاله
امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
دانلود فوری مقاله پس از پرداخت آنلاین
پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات