

عنوان مقاله:

Operation Studies of the Power Systems Containing Combined Heat and Power Plants

محل انتشار:

مجله بهره برداری و اتوماسیون در مهندسی برق، دوره 9، شماره 2 (سال: 1400)

تعداد صفحات اصل مقاله: 12

نویسندگان:

A. Ghaedi - Department of Electrical Engineering, Dariun Branch, Islamic Azad University, Dariun, Iran

H. Gorginpour - Department of Intelligent Systems Engineering and Data Science, Persian Gulf University, Bushehr, Iran

E. Noroozi - Department of Computer Engineering, Sepidan Branch, Islamic Azad University, Sepidan, Iran

خلاصه مقاله:

In today's power systems, the use of methods that can increase the energy efficiency and reduce the cost of the generated energy has received much attention. One of these methods is the use of the combined heat and power (CHP) plants that simultaneously can generate the electric and thermal powers. In the conventional thermal power plants, the thermal energy of the working fluid coming out from the turbine is dissipated that result in low efficiency. However, it can be used for the heating purposes in the CHP units that result in the high efficiency of these plants. Due to the wide use of the CHP units in the power system, different aspects of the power system such as operation may be affected that must be studied. In this paper, the study of the power system operation integrated with the CHP plants is performed. For this purpose, the PJM method that considers the reliability-based indices such as unit commitment risk is utilized. Moreover, a four-state reliability model is developed different types of the CHP units including gas turbine, steam turbine, reciprocating engine, micro-turbine and fuel cell technologies. In the proposed model, both the failure of composed components and the participation of the CHP units in the thermal power generation are considered. To determine the probabilities of different states of the proposed model, matrix multiplication technique is used. Based on the PJM technique, the numerical results associated to the operation studies of the RBTS and IEEE-RTS that are given and the unit commitment risk and the required spinning reserve of these systems calculated considering the effect of the CHP units

کلمات کلیدی:

combined heat and power, Reliability, operation, PJM method, spinning reserve

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1811052>

