Security-constraints economic dispatch which takes into account the generation rescheduling capabilities*

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Abstract

The research aims to develop a mathematical model and algorithm for the solution of the security-constrained dispatch problem that can take into account the system rescheduling capabilities post-contingency. The solution algorithm is based on linear Programming Technique. The operating costs accordincg to proposed generating strategy are less than costs of operating traditional security white it has the same level of security.

The proposed algorithm has been incorporated in the computer package algorithm "SECURITY 2 for Contingency Analysis and Design of Preventive Actions to Achieve a Secure Operation of Electric Power Systems", which we have already developed.

The new algorithm "SECURITY III" has been programmed in C++. The developed program system is able not only to assess the power system security and detect overloaded lines in case of contingencies, and the use of linear programming technique to modify generation strategy and shedding some loads as a preventive action to remove the overload on the lines, but in addition to that, propose generation strategy that has the same security level as the traditional secure operating with lower operating costs.

The developed algorithm and programming system are verified through several test systems. The obtained results have shown the validity and effectiveness of the algorithm and the program.

Keywords: Power system security, economic dispatch, preventive correction, contingency analysis, generation rescheduling.

* For the paper in Arabic see pages (49-70)

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