

A model based on cost minimization and reliability enhancement to solve the power plant preventive maintenance scheduling problem

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1. Introduction and problem description

The Power Plant Preventive Maintenance Scheduling Problem (PPPMSP) requires determining the period for which generating units of an electric power system should be taken offline for planned preventive maintenance over a time horizon. The research performed here encompasses a wide range of power plants: thermal, nuclear, hydroelectric, and wind power plants.

2. Model formulation and methodology

The PPPMSP is a complex optimization problem. Objectives such as total cost minimization and consecution of a certain reliability level are proposed by imposing an objective function and satisfying a set of constraints. This problem is categorized as a 0/1 mixed integer linear programming problem. Its resolution involves the use of an optimiser.

3. Application example and findings

An example based on a high-dimensioned realistic power system was undertaken to validate the model. The findings demonstrate that the model works correctly.

4. Conclusions

- a) Several costs are integrated.
- b) Different power plants were considered.
- c) A wide variety of constraints is included.
- d) The results could be useful if they are applied to other realistic cases.

5. References

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