

# **Optimization model of imperfect preventive maintenance schedule for complex system with critical components**

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## **Abstract**

In practical shop, most of the facilities are complex systems with critical components. Those systems shut down only when the critical components fail, while the failures of the non-critical components will not cause system failure but just reduce the qualification rate. To reduce the failure caused by the critical components and increase the profit for the industry, it is necessary to implement preventive maintenance (PM) based on regular intervals. The paper tries to solve the problem of imperfect PM schedule that is subjected to the failure of critical components. An optimization model is proposed in this paper which aims to minimize the PM cost as well as satisfy production requirement. Based on the delay time theory and the renewal theory, the proposed model will be solved by a novel hybrid Genetic Algorithm (GA)--Ant Colony Optimization (ACO) method. A numerical example is given to illustrate the practicability of the model.

## **Keywords**

complex system; preventive maintenance; imperfect repair; delay time

## **Biographies**

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