Research School for Operations
Management and Logistics

Integrated Planning of Usage-Based Maintenance and Load Sharing Under Resource Dependence
Metehan Dilaver

In the literature, the effect of operations planning and maintenance planning on each other and the benefit of making these plans in an integrated way have been stated by many researchers. Recently, it has been realized that these two planning problems have not just an effect on each other, but they can be a way to control each other. Many researchers have focused on multi-unit systems due to the dependency between units, such as economic and resource dependencies. Although this problem is investigated by researchers numerically and analytically, the effect of the usage levels of the units on the operating cost has hardly been studied. Our research is motivated by the problem of integrated planning of load-sharing and usage-based maintenance for the engines of a ship. In this problem, for every time period, the engines will be used to produce the energy required for the use of the systems of the ship. In this study, this problem is investigated with the consideration of a non-linear fuel consumption function, which is directly related to the amount of energy produced by each engine. The aim is to determine (near) optimal policies that minimize the total maintenance and fuel costs for a finite planning horizon.