



Redundancy Allocation in an Industry using Multi-Objective Optimization – A Review

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ABSTRACT: Reliability engineering is engineering that highlights dependability in a product's lifecycle management. Dependability, or reliability, describes the ability of a system or component to function under stated conditions for a set time period. Reliability engineering represents a branch of systems engineering. Reliability can be defined as the probability of success as the frequency of failures; or in terms of availability, as a probability based on reliability, maintainability and testability. In engineering, redundancy is the duplication of critical components or functions of a system thus increasing system's reliability, usually in backup or fail-safe form, or actual system performance improvement, like in the GNSS receivers' case, or multi-threaded computer processing. In either case, inventory should contain some components or subsystems to replace the failed components. Factors like budget or storage space limits the number of components in inventory can be limited by. The redundancy allocation problem is a way to maximize reliability while minimizing the cost.



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1. INTRODUCTION

Machines, factory lines, vehicles etc. have a large number of components. Each component can fail at any given time. The chance that a component will be working at a given time defines reliability of a component. Failure of a component can cause failure of whole system. The component then has to be replaced. This is called standby redundancy. In certain situations where the components cannot be replaced like in satellites and probes entire system cannot be brought down for maintenance. In those cases we use active redundancy.

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