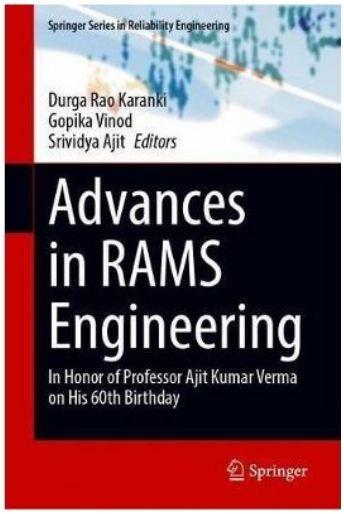
Book Chapter by Prof. Rajesh Prabhu Gaonkar



Brief about the book :

- Presents state-of-the-art research on the reliability, availability, maintainability and safety of engineering systems.
- Enables readers to gain insights into the role of RAMS in a variety of engineering disciplines.
- Elucidates the significance of RAMS on the lifecycle of engineering systems.

Chapter Name :
Application of Fuzzy Sets in Reliability and Optimal Condition Monitoring Technique Selection in Equipment Maintenance

Pages : 327-359

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Abstract of the chapter :
In order to improve the design of a system, we need to identify the least reliable component of the system. Unexpected failure of any component of the system may increase the maintenance and downtime cost due to unavailability of the system. Though this is easy in simpler systems, it becomes a difficult task as the complexity of the system increases. A methodology using mathematical modelling facility of fuzzy set theory is presented in this chapter, which is effective in situations wherein the data available is mostly subjective and it is difficult to get precise quantitative data. After covering basic concepts of various uncertainty modelling theories and fuzzy sets, its application to reliability and fault tree is presented. In the second part of the chapter, multi-attribute decision making methods with application to ranking and optimal condition monitoring technique selection from maintenance engineering domain is presented. These include fuzzy set based Analytic Hierarchy Process (AHP), rating and ranking method, ranking by maximizing and minimizing sets, raking by cardinal utilities and suitability set method.