

Multicriteria and Multiobjective Models for Risk, Reliability and Maintenance Decision Analysis - A Book Review

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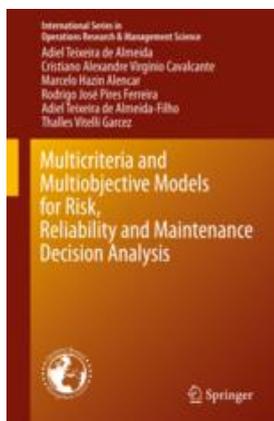
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Abstract - The objective of this work is the book “Multicriteria and Multiobjective Models for Risk, Reliability and Maintenance Decision Analysis”, 978-3-319-17968-1, from Springer Series “International Series in Operations Research & Management Science” review.

The authors are:

- de Almeida, A.T.
- Cavalcante, C.A.V.
- Alencar, M.H.
- Ferreira, R.J.P.
- de Almeida-Filho, A.T.
- Garcez, T.V.



It is composed of twelve chapters

- **Chapter I**
Multiojective and Multicriteria Problems and Decision Models
Almeida, Adiel Teixeira (et al.)
- **Chapter II**
Multiojective and Multicriteria Decision Processes and Methods
Almeida, Adiel Teixeira (et al.)
- **Chapter III**
Basic Concepts on Risk Analysis, Reliability and Maintenance
Almeida, Adiel Teixeira (et al.)
- **Chapter IV**
Multidimensional Risk Analysis
Almeida, Adiel Teixeira (et al.)
- **Chapter V**
Preventive Maintenance Decisions
Almeida, Adiel Teixeira (et al.)
- **Chapter VI**
Decision Making in Condition-Based Maintenance
Almeida, Adiel Teixeira (et al.)
- **Chapter VII**

Decision on Maintenance Outsourcing

Almeida, Adiel Teixeira (et al.)

- **Chapter VIII**

Spare Parts Planning Decisions

Almeida, Adiel Teixeira (et al.)

- **Chapter IX**

Decision on Redundancy Allocation

Almeida, Adiel Teixeira (et al.)

- **Chapter X**

Design Selection Decisions

Almeida, Adiel Teixeira (et al.)

- **Chapter XI**

Decisions on Priority Assignment for Maintenance Planning

Almeida, Adiel Teixeira (et al.)

- **Chapter XII**

Other Risk, Reliability and Maintenance Decision Problems

Almeida, Adiel Teixeira (et al.)

According to the authors “Multicriteria and Multiobjective Models for Risk, Reliability and Maintenance Decision Analysis” is implicitly structured in three parts. The first part deals with MCDM/A (Multi-Criteria Decision Making/Analysis) concepts methods and decision processes. The second part presents the main concepts and foundations of RRM (Risk, Reliability and Maintenance). Finally the third part deals with specific decision problems in the RRM context approached with MCDM/A.

1. The Review

Since a long time Operations Research is connected with Management. In this sense it is a fundamental tool in the management of organizations, in particular the ones producers of services and goods: the companies. There some of the most important professionals are engineers and

managers.

The “Multicriteria and Multiobjective Models for Risk, Reliability and Maintenance Decision Analysis” authors represent a group of active members of scientific societies in Operations Research and RRM areas and are Professors in Management Engineering. In this book they efficaciously show how to use the multiple criteria concepts and methods within the RRM context. Applied Probability (Decision Analysis, Reliability Theory,...), Decision Making (MCDM, MCDA,...) and Mathematical Programming (Multiobjective Optimization,...) are the main tools used in the text.

The book is very well structured and written in very good English. The whole cases studied are consistently scientifically approached and their practical application adequately exemplified.

It is divided, implicitly, not effectively, in three parts. The first two are mainly conceptual and methodological. The third is more operative. In the first part are considered MCDM/A concepts methods and decision processes. In the second part the main concepts and foundations of RRM are presented. Finally the third part, supported on the former ones, deals with specific decision problems in the RRM context approached with MCDM/A.

Since Reliability and Maintenance become of major importance, due to

- the demands that the services are permanently available (generating each interruption losses and customer abandonment) and the products are of consistently high quality (the lack of quality

causing complaints and opting for an alternative product),

- the companies fight to reduce the costs and simultaneously improve their performances in order to reach their strategic objectives,
- failures may cause dramatic consequences in terms of safety and environmental losses,

this book becomes important, even indispensable, either for academic or for professionals in the fields of service and industry. Also as the whole subjects are explained very clearly, in a very pedagogical way, it may conquer larger number of readers.

2. Overall review

“Multicriteria and Multiobjective Models for Risk, Reliability and Maintenance Decision Analysis” is an outstanding text on the multiple criteria concepts and methods use within the Risk, Reliability and Maintenance context. It is an indispensable book, either for academic or for professionals in the fields of services and industry, beginners or seniors, and for anyone curious on this subject.

3. References

- [1] **de Almeida, A. T., Cavalcante, C. A. V., Alencar, M. H., Ferreira, R. J. P., de Almeida-Filho, A. T., Garcez, T. V.** Multicriteria and Multiobjective Models for Risk, Reliability and Maintenance Decision Analysis. International Series in Operations Research & Management Science 231, ISBN: ", 978-3-319-17968-1. Springer International Publishing Switzerland, 2015.