

Asset Analytics

Performance and Safety Management

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The main aim of this book series is to provide a floor for researchers, industries, asset managers, government policy makers and infrastructure operators to cooperate and collaborate among themselves to improve the performance and safety of the assets with maximum return on assets and improved utilization for the benefit of society and the environment.

Assets can be defined as any resource that will create value to the business. Assets include physical (railway, road, buildings, industrial etc.), human, and intangible assets (software, data etc.). The scope of the book series will be but not limited to:

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- Production rate enhancement with best practices
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Sarbjee Singh · Alberto Martinetti ·
Arnab Majumdar · Leo A. M. van Dongen
Editors

Transportation Systems

Managing Performance through Advanced
Maintenance Engineering

 Springer

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ISSN 2522-5162

Asset Analytics

ISBN 978-981-32-9322-9

<https://doi.org/10.1007/978-981-32-9323-6>

ISSN 2522-5170 (electronic)

ISBN 978-981-32-9323-6 (eBook)

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This Springer imprint is published by the registered company Springer Nature Singapore Pte Ltd. The registered company address is: 152 Beach Road, #21-01/04 Gateway East, Singapore 189721, Singapore

Preface

Writing a book is always a challenge. Writing over transportation systems can be even more challenging because they represent a key sector for the development of our future society. It needs to be tackled with precision and consistency.

In recent years, the usage of public transport systems (railways, airways, motorways) all across Europe has rapidly increased. In the Netherlands between 2015 and 2016 there was a 4% (1.2 million) increase in the number of train passengers and this growth seems set to continue. Transportation companies are investing heavily in both safety and maintenance strategies in order to cope with this growth and ensure the quality of proper services. Systems such as the ERTMS (European Rail Traffic Management System) are currently being implemented in order to provide better safety, to harmonise regulations and to increase the capacity of the European railway network. Whilst acknowledging the importance of the passenger transportation sector to the continued growth and prosperity of European nations, it is important to recognise that the working conditions, human performance and maintenance requirements in this sector differ considerably from those of other industries. In particular, human operators play a critical role in the safety of this sector and decrements in human performance are noted as a major contributor to accidents and incidents within the complex railway and highway system. Between 1970 and 1998, 62% of the major railway accidents in Norway were the result of human errors and during the same period, on just four British railway lines, 141 accidents were caused by human errors.

In a nutshell, assets need to be carefully design and maintained during complete life-cycle. Therefore, in order to improve the overall performance of the passenger transportation systems, it is essential to reduce human errors associated with their operation and maintenance, with their attendant disruptions, as effectively as possible.

The pulling factor for us, as authors, to write about maintenance of Transportation Systems has been to ground the foundations of this discipline, combining theory to real cases. The experience and knowledge at Luleå University of Technology, University of Twente and at Imperial College of London, on the topics of this book like maintenance, Big Data and human factors, in combination with the support of

industries and companies, gives us the opportunity to provide a valuable tool for both training students and helping professionals.

Consequently, the objective of the book is to present and discuss advances in maintenance of transportation systems. Firstly, the book offers an introduction to the context highlighting issues, challenges, and possible system integrations. Secondly, an overview on process-oriented innovations is given. After that, a strong focus on smart maintenance management is offered. Lastly, cultural changes and knowledge management in transportation systems are tackled. With this vision in mind, the book aims to be a reference source for providing technological advancements.

Luleå, Sweden/Jammu, India
Enschede, The Netherlands
London, UK
Utrecht, The Netherlands

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Prof. Dr. Leo A. M. van Dongen has worked for the Netherlands Railways (NS) for over 30 years. He is Chief Technology Officer (CTO), responsible for the Asset Management of the rolling stock fleet, workshops and maintenance equipment. Since 2010, he has been a part-time Professor of Maintenance Engineering at the University of Twente, Department of Design, Production and Management, Faculty of Engineering Technology. He obtained his Ph.D. from Eindhoven University of Technology. At DAF Trucks he was active in the development of diesel engines. During his career at NS, he has focused mainly on technological functions. In addition to his work at NS he promotes the academic development of the profession and encourages further research into maintenance processes: from design methodologies for capital goods to the development of associated maintenance concepts, not only for the initial investment, but also for the management during the entire life-cycle.