DOI: https://doi.org/10.30932/1992-3252-2021-19-280-283

Decision-Making Optimisation in Traffic Control Management

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Zyabirov, Kh. Sh., Shapkin, I. N. Optimisation of decision-making in railway traffic control management (theory, practice, prospects) [Optimizatsiya prinyatiya reshenii v upravlenii perevozochnym protsessom na zheleznodorozhnom transporte (teoriya, praktika, perspektivy)]. Moscow, Finansy i statistika publ., 2020, 424 p. ISBN 978-5-279-03606-6.

The book under review examines the historical milestones in development of railway transport in the Russian Federation, analyses its rise and main directions of development in the forthcoming period and up to 2030. The authors propose preferable models and methods for decision-making regarding traffic control at the level of stations and sections, describe optimal management decision-making regarding wagon fleet and technology of train and cargo operation, methods and algorithms for decision-making referring to management of locomotive fleet and locomotive crews. Heuristic methods and algorithms for decision-making while solving the problems of forecasting and standardisation of train and cargo operation are studied regarding railway and network dispatching. Methods and models of decision-making ensuring an increase in railway safety are also examined. The examples concern efficient models of decision-making in traffic controlling in the context of network technologies and methods for assessing the economic efficiency of decision-making based on development of intelligent and digital technology.

Keywords: *railway, traffic control, wagon fleet, locomotive crews, railway and network dispatching, railway safety.*

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Article received 10.12.2020, accepted 22.01.2021.

For the original Russian text of the article please see p. 280.

The work of Kh. Sh. Zyabirov and I. N. Shapkin entitled «Optimisation of decision-making in railway traffic control management (theory, practice, prospects)» is devoted to one of the most important issues in organisation of the transportation process which is optimisation of decision-making in railway traffic control management.

The relevance of the issues under consideration is predetermined by the fact that the book has been written in collaboration of a senior executive manager experienced in organisation of railway transportation and a professor at the department of operations management and transport safety of Russian University of Transport.

As former disciples, the authors dedicated the book to their teacher, Fedor P. Kochnev, professor and rector of MIIT University, and the teaching staff of the department of operations management.

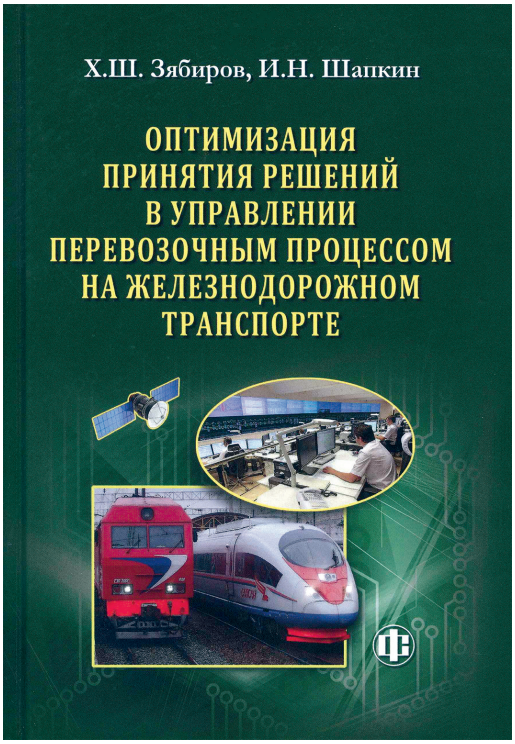
The book considers the issues of optimisation of decision-making at all levels of management regarding transportation processes.

The work presents the historical milestones in development of railway transport in the Russian Federation, formulates main directions of development for the period up to 2030 and trends in global railway developments.

It is worth to note the successful description of sequence of optimisation of decision-making in control processes regarding technical stations, relief trains, etc. Described optimal decision-making models concern technological train operation on railway sections and network segments.

A significant place is dedicated to optimisation of decision-making regarding management of locomotive trains and the use of locomotive crews. Presented methods consider daily shift planning, placement of a row of locomotives of a station's fleet, and technical planning of the use of locomotive crews. Criteria for quality of technical planning are studied in relationship with the graphs of the train traffic schedule chart.

The book highlights the topics of importance of development of methods and models of



decision-making focused on improving of railway safety, as well as of adoption of effective models of decision-making to adopt new technology supported by the review of theories and promising fields of development of scientific and technical research on railway operations.

A feature of this book is the coverage of development of railways as of railway transport systems, of adoption of digital technologies. The economic efficiency of decision-making in railway traffic control management is shown at the example of the logistic model of implementation of the plan for implementation of the Eastern Polygon investment project. The appendix contains lists of various techniques applied at stations while performing cargo, traffic, and local operations.

I am sure that this scientific edition will undoubtedly be useful. The book contains new knowledge and technological solutions and will help developers, scientists, specialists, as well as Ph.D. students, master's students and students at transport universities specialising in railway operations, effective management, development of new optimal solutions in managing the railway transportation process. ●