

PREFACE TO THE SPECIAL ISSUE ON RECENT ADVANCES IN RELIABILITY AND MAINTENANCE

When reliability and maintenance issues are dealt for real applications, we often encounter a number of problems related to modeling and optimization. Reliability and maintenance modeling with optimization plays an essential role for the quantitative analysis, and is considered as a significant part of Operations Research. The 9th International Conference on Mathematical Methods in Reliability, – Theory, Methods and Applications – (MMR-2015), which is a premium event on reliability and maintenance research, was held in Tokyo, Japan, on June 1–4, 2015. Based on not only the research results presented at this nice occasion but also the latest achievements by non-participants of the conference, we planned to edit the special issue on Recent Advances in Reliability and Maintenance, where the focus was on new and innovative techniques that support the development of highly reliable and safe systems in engineering and management field.

We received 10 well-prepared and high quality submissions by September 30, 2015, and spent almost one year to complete our editing task. In accordance with the journal’s review discipline, each submission was reviewed by two referees without conflict to the authors. Finally, we accepted 4 papers where the acceptance rate was 40%. We regret to mention that we had to reject some good papers because of our tight review schedule.

“Decomposition of a Multi-state System by Series Systems” by Ohi gives the purely mathematical results for multi-state coherent systems with a series structure. The results obtained will be useful to characterize the real component-based systems with multi-state. Saito et al. propose a nonparametric maximum likelihood estimation for trend renewal processes with application to reliability and maintenance. They succeed to improve the existing constrained nonparametric maximum likelihood method, and validate their refined algorithm in illustrative examples. Julanto et al. consider a “Preventive Maintenance Policy for Consecutive- k -out-of- n : F System” and derive numerically the optimal preventive maintenance interval time which minimizes a relevant expected cost rate. Dohi et al. consider a “Dynamic Software Availability Model with Rejuvenation” and investigate the effectiveness of two reinforcement learning algorithms as nonparametric inference approach to rejuvenate operational software systems.

The guest editors are pleased to publish this special issue on the most recent research results in reliability and maintenance. Finally, we thank the former editor-in-chief, Dr. Shinji Mizuno, and the present editor-in-chief, Dr. Tetsuya Takine, for their helpful support and comments.

Tadashi Dohi, Guest Editor
Fumio Ohi, Guest Editor