Guest editorial

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We are pleased to bring out this special issue of *Journal of Life Cycle Reliability and Safety Engineering*. This issue contains selected invited/presented papers presented at the Third SRESA National Conference on Reliability and Safety Engineering (NCRS2016), held during 01–03, December 2016, at SSN College of Engineering, Chennai, India.

This issue covers various areas of importance such as physics of failure modeling of components, human reliability analysis, life testing, product warranty, external event risk analysis and reliability-based system optimization. The papers provide an insight into the developments in these subjects. I am grateful to various authors who have made significant contributions to the field of Reliability Engineering and could present their papers in NCRS2016.

This special issue comprises of seven papers.

The first paper, “Experimental Program for Physics-of-Failure Modeling of Electrolytic Capacitors towards Prognostics and Health Management”, by Yeshpal Singh Rana et al., presents the importance of physics of failure models for prognostic health monitoring of systems, where focus is given to electrolytic capacitors. It discusses the experimental program for thermal and electrical overstress studies toward degradation models for electrolytic capacitors, highlighting the role of observing parameters such as equivalent series resistance (ESR) and capacitance (C) for monitoring the health of such capacitors.

The second paper on “Development of a BN Framework for Human Reliability Analysis through Virtual Simulation”, by Vipul Garg et al., discusses the use of virtual simulation as a tool to generate the human factor (HF) data from the virtual model of an in-house experimental facility. It also demonstrates the use of multi-attribute utility theory

to determine a suitable human reliability analysis method to quantify the human error probability and finally applies Bayesian network technique to account for HF interactions.

The importance of human reliability analysis and strength of Bayesian Network is once again evident through a third paper on “BAYES-HEP: Bayesian Belief Networks for Estimation of Human Error Probability”, by Karthick M. et al. This paper introduces a method that uses the available historical data and provides efficient technique for automated evaluation of human error probability using BBN, on human cognitive reliability (HCR) model.

The fourth paper on “Acceptance sampling plans for inverse Weibull distribution based on truncated life test”, is by Sukhdev Singh et al. This paper addresses the problem of double and group acceptance sampling plans for an inverse Weibull distribution based on truncated life test. It presents a simulation study to support the proposed methods for sampling plans and a comparison between single and double acceptance sampling plans is made.

The fifth paper on “A Stochastic Model for Remanufactured Products with Warranty in Supply Chain”, by Sarada Yedida et al., discusses the significance of product warranty, considering the stochastic nature of demand of the remanufacturer and the time to failure of the products sold under warranty.

External flood is an important common cause initiating event in nuclear power plants (NPP). The sixth paper on “Estimation of Initiating Event Frequency for External Flood Events by Extreme Value Theorem”, by Sourajyoti Chowdhury et al., describes the methodology for calculating the initiating event (IE) frequency for external flood events for the sample inland Indian NPP. The general extreme value (GEV) theory based on the maximum likelihood method (MLM) and order statistics approach (OSA) is used to analyze the rainfall data for the site.

The seventh paper on “Reliability Based Design Optimization of Passive Poison Injection System (PPIS) for Advanced Heavy Water Reactor”, by Santhosh Venkatarayappa Thamampalli et al., highlights the role of

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reliability in handling the design optimization of advanced passive safety systems.

We are thankful to Prof. P. V. Varde for inviting us to bring out a special issue of *Journal of Life Cycle Reliability and Safety Engineering*. We are grateful to several reviewers for their comments and suggestions which helped in improving the quality of the papers in this special issue. We hope that this issue will prove to be a great success with the academia, researchers and engineers in the area of reliability and safety.

Prof. Gopika Vinod

Prof. R. Sujatha

Prof. Gopika Vinod

Prof. Gopika Vinod joined in the Reactor Safety Division of Bhabha Atomic Research Centre as a Scientific Officer from the 37th batch of Training School after completing her graduation in computer engineering. She received her doctorate degree in reliability engineering from the Indian Institute of Technology, Bombay, and has also been a postdoctoral fellow at Steinbiers Advanced Risk Technologies, Germany. She is a recipient of DAE Young Engineer Award 2007. She is a visiting scientist at Brookhaven National Laboratory. Currently, she is heading the Probabilistic Safety Section of Reactor Safety Division of BARC. She is faculty in Homi Bhabha National Institute.

She has been actively involved in reliability, safety and risk analysis of Indian nuclear power plants. She has worked

on the development of reliability-based operator support systems such as risk monitor, symptom-based diagnostic system, for Indian nuclear power plants. Her other areas of research activities include risk-informed in-service inspection, reliability of computer-based systems, dynamic reliability analysis, etc.

She is on the editorial board of *International Journal of System Assurance Engineering and Management*, Springer; Journal Referee to *IEEE Transactions on Reliability*, *Reliability Engineering and System Safety*, *Risk Analysis*, *Annals of Nuclear Energy*, *Nuclear Engineering and Design*, etc. She has also been a member of the technical committee for various conferences such as PSA 2011, ISSRE 2012, PSA 2013, ICRESH 2005, ICRESH 2010, and ICRESH 2015.

Prof. R. Sujatha

R. Sujatha, PhD (IIT Madras) is Associate Professor in the Department of Mathematics, SSN College of Engineering, Chennai. She is a recognized guide for PhDs in Anna University, Chennai and Bharathiyar University, Coimbatore. She worked on the properties of maximum rank distance codes and developed concatenation of codes with rank distance metric which led to a book. She worked in research areas like applications of hidden Markov models, software reliability and fuzzy theory. She has been guiding PhD students. She has 75 publications to her credit.