#### **Course Application Fee:**

Application fee (non-refundable) of Rs. 5,000.00 (GST included) to be paid when applying for the course through the following link: https://erp.iitkgp.ac.in/CEP/courses.htm

#### Course Fee:

For Indian Nationals INR: 40,000 (GST 18% included)

For Foreign Nationals USD: 2,000 (including GST)

#### Accommodation:

Accommodation is reserved for the participants in our new technology guest house. Charges for accommodation and food are to be paid by the participants on actual billing.

### Limited Seats: 30 (Thirty Only)

#### **Address for Correspondence:**

Prof. Neeraj Kumar Goyal (Principal Coordinator) Professor Subir Chowdhury School of Quality & Reliability IIT Kharagpur, West Bengal – 721302 Tel: +91 3222 28 3990 Mob: + 91 9434741267 Email: ngoyal@hijli.iitkgp.ac.in

Dr. Ajeet Kumar (Coordinator)

Managing Director Nippon Koei Mobility India Pvt. Ltd. Vista Pixel, Jakkuru, Airport Bellary Road, Bangalore, 560092, India Mob: +91 8886411889 Email: dr.ajeet@nk-mobility.com

#### **Participating Organizations (Earlier Editions)**

- AECOM India Pvt. Ltd.
- Alstom Transportation
  - Arcadis India
- Areca Embedded Sys Pvt Ltd
- ASCRIT Pvt. Ltd.
- Atkins, Bangalore
- Bangalore Metro
- Bombardier Aerospace
- Bureau Veritas
- BE Analytic
- Central Electronics Limited
- DFCCIL, Delhi
- DB International GmbH
- DMRC, Delhi
- DNV GL Business India
- DNV Millennium Center
- DQS India
- Dubai Metro
- EGIS India Consulting
- Etap Automation Pvt Ltd
- Etihad Rail DB Operations
- Expo link Route 2020
- ELGI Equipment's Limited
- Faiveley Transport India
- FCC Riyadh Metro Rail
- FLOW Riyadh Metro Rail
- G. G. Tronics
- Geometric Global
- Indian Railways
- Jacobs
- JAKSON Ltd
- Jio Platforms Limited
- JRR Safe Logic
- Kochi Metro Rail Ltd,
- Keolis Hyderabad
- L&T Mindtree
- L&T Construction
- L&T Metro Rail Hyderabad
- L&T Technology Services
- Louis Berger
- Lotus Wireless Tech., India

- MMRC, Mumbai
  MEGA Company Ltd.
- Metro One Operation
- Motorola Solutions India
- Mott MacDonald India
- Maha Mumbai metro
- operation corporation Ltd
- Mumbai Metro One Pvt.
- NHRCL India
  - Nippon Koei India Ltd
  - Oriental Consultants
  - Parimala Trinity
  - QDVC Doha, Qatar
  - RATP DEV, Saudi Arabia
  - RAMPED, Saudi Arabia
  - Rapid Metro Gurgaon
  - Rail Vikas Nigam Limited
  - RITES Ltd.
  - RTA Dubai
  - RSK Business Solution
  - Parsons Limited, Riyadh
  - Saudi Railway Company
  - Scomi Engineering Bhd.
  - SENER Ingenieria Sistemas
  - Serco Limited
  - Sidwal Refrigeration
  - Systra MVA Consulting
  - Siemens Mobility
  - Shimizu Corp., Singapore
  - Synergy Systems
- Tata Projects Limited
- ThyssenKrupp Elevator
- TVM Signalling System
- Titagarh Wagons Ltd.
- Vedanta Limited

Short-term Course on

# RAMS for Railway Systems





Subir Chowdhury School of Quality & Reliability IIT Kharagpur, West Bengal, INDIA

Organized By:

# About Subir Chowdhury School of Quality and Reliability, IIT Kharagpur

IIT Kharagpur is the largest technical institution in India and gets ranked among best institutions in the country imparting technical education and research. The Subir Chowdhury School of Quality and Reliability was formerly known as Reliability Engineering Centre, which came into existence in 1983. The school offers M Tech, MS and PhD degrees in Quality and Reliability Engineering. Besides, the school is actively engaged in sponsored research and offers consultancy services to various public and private organizations.

## **Brief About the Course**

## **Earlier Editions:**

RAMS for Railway Systems course is being offered since last twelve years. This course has been conducted during July 21-25, 2014; July 27-31, 2015; July 11-15, 2016; July 10-14, 2017; July 9-13, 2018; July 8-12, 2019; Dec 14-18, 2020 (online); Dec 06-10, 2021(online); Dec 05-09, 2022 (online); July 03-07, 2023; July 8-12, 2024. The programs received good response from industries in terms of participation, and on completion of the course, the feedback was highly positive. Based on the feedback and multiple requests received, the program is proudly being offered again. We look forward to benefiting railways authorities and rail support industries by bringing awareness about System Assurance/RAMS processes and providing training on these concepts.

## Who Should Attend?

Practicing RAMS professionals, Engineers, or Managers working in the fields of design, development, consulting, manufacturing, audit, operations, maintenance, or QA/QC in the rail and rail support industries.

## **Industry Problem Discussions**

If your organization or project is facing any challenge or problem related to RAMS, please feel free to write to us in the form below. This can be used during the program for discussion and resolution.

Name:

Organization:

#### Problem Statement:

#### **Program Organizers:** Principal Coordinator:

Prof. Neeraj Kumar Goyal Associate Professor Subir Chowdhury School of Quality and Reliability, IIT Kharagpur

#### **Coordinator:**

Dr. Ajeet Kumar Managing Director Nippon Koei Mobility India Pvt. Ltd. Bangalore, India

## **Faculty:**

The program is designed and delivered by IIT Kharagpur faculty and RAMS experts with years of experience in System Assurance & RAMS on railway industries with cross-functional domain understanding of transport sectors. Almost all faculty members are currently associated with the industry in a consulting role.

## **Program Contents:**

- Course Introduction, RAMS Parameters & Reliability Mathematics
- Failure Data Analysis (Parametric & Non-Parametric)
- Reliability Prediction using MIL 217
- System Reliability Modelling
- Risk Modelling
- Failure Mode Effects & Criticality Analysis
- Functional Safety, Hazard, Risk & Risk Matrix
- System Assurance & RAMS
- SIL Concept and its determination
- RAMS Standards for Railway Application-EN 50126, 50128 and 50129
- Cyber Security in Railway Application
- RAMS Demonstration during O&M
- Life-cycle cost analysis- A case study