

Training Program	: FMEA & RCM FOR RAILWAY INDUSTRY
Discipline	: RELIABILITY & MAINTENANCE ENGINEERING
System	: RAILWAYS ASSETS (ROLLING STOCK, SIGNALLING, INFRASTRUCTURE, LOCOMOTIVE)
Subsystem	: Railways assets (Pantograph, Bogie, Breaks, Train Control Management System (TCMS), Balise, Computer Based Interlock (CBI), Lineside Electronic Unit (LEU), Radio Block Centre(RBC), Locomotive Diesel Engine, others.)
Training Focus	: FMEA and RCM Concept and application for Railways
Lesson Code	: 205
Lesson Title	: Design Failure Mode and Effect Analysis (DFMEA), Process Failure Mode and Effect Analysis (PFMEA), Failure mode and Effect analysis (FMEA), FMEA program, FMEA the basis for FRACAS, Maintenance concept, RCM, RCM program, Preventive maintenance register, inspection Register.
Training Elements	: Design Failure Mode and Effect Analysis (DFMEA), Process Failure Mode and Effect Analysis (PFMEA), Failure mode and effect analysis (FMEA), FMEA program, FMEA as basis for Failure Report and corrective Actions System (FRACAS), Maintenance concept, RCM, RCM program, Preventive maintenance register, inspection Register.

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Training Objectives:

- To understand the failures, risk and criticality concepts.
- To understand the different application of FMEA and FMECA concepts
- To understand the Design Failure Mode and Effect analysis (DFEMA).
- To understand the Process Failure Mode and Effect analysis (PFMEA).
- To understand the System Failure Mode and Effect analysis (FMEA).
- To understand the Risk, RPN and criticality concepts.
- To understand the FMEA application to FRACAS.
- To understand the Maintenance concepts.
- To understand the Reliability Centered Maintenance (RCM) concepts.
- To understand the RCM input to RAM analysis, LCC and spare part definition.

Day 1:

Subject	Activity	Time	Resources
Module 1 - Welcome and Introduction of participants and trainer, scope of training.	Theoretical	30 min	Forms & PPT
Module 2 - FMEA concept and standards	Theoretical	30 min	PPT
Module 3 - Risk, RPN and criticality	Theoretical	30 min	PPT
Module 4 - DFMEA/ PFMEA concept	Theoretical	90 min	PPT
Module 5 - FMEA Management	Theoretical	30 min	PPT
Module 6 - FMEA applied to FRACAS	Theoretical	30 min	PPT
Lunch Break: 12:30 – 14:00 hrs.			
Module 7 - FMEA case studies	Theoretical	60 min	Microsoft Excel
Module 8 - Railways FMEA Application cases in software	Practical	180 min	FMEA Software

Day 2:

Subject	Activity	Time	Resources
Module 1 - Maintenance Concepts	Theoretical	30 min	PPT
Module 2 - RCM concepts and standards	Theoretical	30 min	PPT
Module 3 - RCM input to RAM analysis	Theoretical	30 min	PPT
Module 4 - RCM input to LCC	Theoretical	30 min	PPT
Module 5 - RCM input to Spare parts	Theoretical	30 min	PPT
Module 6 - RCM Management	Theoretical	30 min	PPT
Module 7 - RCM input to asset management (Maintenance Register)	Theoretical	60 min	Software Integrity PRO PPT
Lunch Break: 12:30 – 14:00 hrs.			
Module 8 - Railways RCM application cases	Practical	120 min	Microsoft Excel
Module 9 - Railways RCM Application cases in software	Practical	120 min	RCM Software