Centre For Industrial Solutions and Advanced Training

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Two Days Training Programme on

RCM & FMECA (Reliability Centered Maintenance & Failure Modes, Effects and Criticality Analysis) a Proactive Maintenance Strategy

13-14 Dec 2019 at Mumbai

Key Learning Outcomes:

The objective of this Two day workshop is to provide an understanding of the RCM method along with FMECA of maintenance task optimisation. Participants will gain an understanding of the use of failure data analysis and failure forecasting and how to choose optimum maintenance tasks that reduce the costs to the business.

Introduction and Benefits for RCM, FMEA and FMECA:

In today' s 'VUCA' world the provision of safe, reliable, compliant and sustainable products or services as well as efficient supply chain risk management, fundamentally rely on best practices/ process controls and information management which has become a challenge for a business to survive in current competitive environments. To deal with these challenges, knowledge and skill development on 'FMEA/FMECA' has become important and essential for practicing professional, engineers, and managers and General management team lead of all categories of industry or establishments to improve bottom line profitability and gain a competitive advantage in their respective market segments. Increasing reliability and reducing risk lowers the total cost of equipment ownership, lowers production costs and increases plant capacity? Exactly what today's companies need?

Failure Modes and Effects Analysis (FMEA) or Failure Mode Effect Critical Analysis (FMECA) methodologies identify the possible failure modes of a system, sub-system, procedures, product (machine or equipment or service or part of the equipment), their respective causes of failure modes and the possible failure effect (consequences).The analysis based on severity of consequences enables corrective measures to be taken with its priority of action to be taken, to contribute to improved designs for products or machines and processes, resulting in higher reliability, better quality, increased safety, enhanced customer satisfaction and reduced costs.

In the context of process industries such as Fertilizers, petrochemical, chemical, oil & gas, energy sector, cement, pharmaceutical and many hazardous industries where operational reliability of equipment, safety and associated operating risks are the pressing problems/concerns, the FMEA/FMECA has become an important task for improving asset reliability and preventing or mitigating the potential safety risk of injury or accident to people, property and environment impact. FMEA methodology can also be used successfully to establish and optimize maintenance strategy plan and spare part inventory management system for repairable assets and contribute to control plans and other quality assurance proceduresresulting in decreased life cycle cost of equipment and significant financial business gains. FMEA also provides a knowledge base of failure mode and corrective action information that can be used as a resource in future troubleshooting efforts and as a training tool for new engineers/ professionals.

Who can attend this workshop /training program?

Prospective Participants, from various industries such as Fertilizers, cement, chemical, petrochemicals and oil and gas and refinery, power sector, Utility and infrastructures , OEMs of process machines –Turbo machinery (Pumps, compressors, Turbines, blowers, fans, expanders) and other process equipments, Pharmaceuticals, Detergent manufacturing company, Capital Goods manufacturing company etc., are:
This is highly practical and interactive course has been specifically designed for people: responsible for the maintenance function

- Plant Operations Managers, Process Engineers, production engineers and process safety management team leaders
- Maintenance and Reliability Engineers and managers, supervisors of all disciplines (Electrical, mechanical, instrumentation, civil, corrosion and Metallurgy)
- Project engineers, Construction engineers and personnel involved in heavy lift machinery management
- Engineers, Team leaders and other personnel involved with Design, Production, Process, Equipment, Maintenance Management and Supervision, materials and spare parts management,

- Senior leadership members wishing to implement and drive FMEA/FMECA methodology to achieve business objectives.

Professionals responsible for the assets themselves (plant managers and production/operations managers) who actually maintain and operate equipment Maintenance, plant/facility engineering staff, rotating equipment engineers, Top, Middle level executives, responsible for plant physical Asset Management

-Anyone wishing to secure optimum performance from any physical assets, from the viewpoint of

Safety, environmental integrity, output, product quality or customer service.

-Managers at industrial plants, reliability engineers and those interested in rotating equipment performance.

-Suitable for the persons involved in all business activity types including Chemical process plant, oil and gas, power generation, pharmaceutical, Steel, cement, sugar industries etc.

Objectives of the course:

At the end of this workshop, participants are expected to be able to apply RCM principles with suplimental professional analysis of FMEA/FMECA methodologies to their plant specific safety and production critical equipment, assets, systems, procedures for identification of all catastrophic and critical failure possibilities so that they can be eliminated or their associated risk mitigated at the earliest possible time through design / Process correction, modification or up gradation as necessary to achieve safe ,reliable and compliant operation and competitive performance.

What participants would gain are:

- Be aware of the aims, objectives and benefits of RCM at plant along with FMEA/FMECA
- Understand the importance of FMEA as a Risk Analysis tool and mitigation plan.
- Understand the process of implementing RCM & developing, applying FMEA
- Be capable of implementing and reap the benefits of RCM with learning & completing a Design FMEA, Process FMEA, Machine FMEA & system FMEA
- Be able to develop, monitor/track & act upon identified action items in the RCM & FMEA steps.

- Reduce significantly the risk of failure in a production / product design, process, operation, construction, commissioning and steady state maintenance throughout the operating life cycle.
- Reduce significantly the risk of failure in a manufacturing process

COURSE OUTLINE (Indicative but not exhaustive):

- Introduction & Historical evolution
- Why Traditional Maintenance cannot meet the needs of business today.
- Why RCM
- What is RCM and how does RCM Cost deliver this methodology plus more.
- RCM philosophies & Conducting RCM Analysis
- RCM terms and definitions
- Identifying system parameters
- Answering the 7 questions of RCM
- Determining failure mitigation strategies
- Implementing the results of RCM analysis
- Introduction to FMEA/FMECA
- Understanding the fundamental definition and concepts of FMEA/FMECA
- Introduction & objective to the procedural steps needed to perform FMECA
- Types of FMEA; System FMEA, Design FMEA, Process FMEA
- Simple example of system, design and process for quick understanding
- Generic FMEA Worksheet with filling and generating Inputs and Outputs to FMEA
- Defining the FMEA Project & Scope
- Creating an Effective cross-functional FMEA Team
- Gather and review Reference Material
- How to identify failure modes that can impact your plant.
- How to arrive the failure data relevant to your equipment
- Failure analysis using Weibull feature; KPIs, Reporting to management for corrective points
- Assessing the total cost impact of failure on a business.
- How Preventive Maintenance and Predictive Maintenance improve business, safety, environment and operational risks.
- How to select the optimum maintenance task and frequency.

- Maintenance Decision making elements and sensitivities
- Risk based Inspection and maintenance plan linked to FMECA/FMEA
- Learning about the best maintenance practices as an outcome of FMEA analysis.
- FMEA Exercise (A case study)
- Facilitating RCM at your site with Team approach
- Who should lead? Choosing the appropriate analysis tools
- Tracking progress through to completion
- Avoiding the causes of failed RCM Implementations
- Leveraging the Benefits of RCM
- The FMEA library & OREDA
- Celebrating results
- Showing the business case

Q & A session

Certification: Every successful participant will be awarded a course completion certificate.

Delivery Methodology (Strategy):

- Introduction and Objective Setting
- Pre and Post Test,
- Knowledge Presentations,
- Assignments & Exercise,
- Discussion and Interaction, Feedback and Assessment
- Delivery 10:00 AM to 17:30 PM

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Registration:

Dates of the program: 13-14 Dec 2019 at Mumbai.

Nonresidential Participation fees: **INR 24500/- PP + GST@18%** Training program includes training material hard copies, Tea, Lunch & snack, excluding lodging and Boarding)

Payment: ECS/NEFT/DD in favor of "Centre for Industrial Solutions and Advanced Training" Payable at Nagpur, Maharashtra, India. Account No: 0509102000003353 Bank: IDBI, Wardha-

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Venue: Mumbai

We do prefer on line Registration through our web www.cisat.co.in.

For Registration please do send nominations details through email to,

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Contact for any In-house Training Program at your plant or location.

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