Centre For Industrial Solution and Advanced Training
Internationally Training Service Provider An ISO 9001:2015 Certified
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Two Days Training Programme on

Failure Modes, Effects and Criticality Analysis (FMECA) to Design Proactive Maintenance Strategy

9-10 July 2018@Mumbai

Introduction and Benefits for 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 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:

- 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.

Objectives of the course:

At the end of this workshop, participants are expected to be able to apply 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 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 FMEA/FMECA
- Understand the importance of FMEA as a Risk Analysis tool and mitigation plan.
- Understand the process of developing a FMEA
- Be capable of completing a Design FMEA, Process FMEA, Machine FMEA & system FMEA
- Be able to develop, monitor/track & act upon identified action items in the FMEA steps.
- Reduce significantly the risk of failure in a 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: Introduction to FMEA/FMECA

- Understanding the fundamental definition and concepts of FMEA/FMECA
- Primary objective of FMEA
- Introduction 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
- Inputs and Outputs to FMEA
- Benefits and Purpose of Process FMEA's
- Pre-Requisites to FMEA
- Understanding your Customers Needs
- Defining the FMEA Project & Scope
- Creating an Effective cross-functional FMEA Team
- Gather and review Reference Material

Developing Functions

- Definition of a Function
- The Function Worksheet
- Methods for Function Analysis
- Simple Brainstorming

- Process Functional Modeling
- Organizing the Functions
- Functional Flowcharts
- Process Example
- Class Participant Workshop

Developing Failure Modes

- Failure Mode Definition
- Failure Mode Thought Starters
- Failure Mode Assumptions
- Failure Mode Categories
- Example

Determining Effects & Severity Ratings

- Effects Definition · Cause & Effect Relationship
- Effects Examples
- Severity Rating Definition
- Severity Tables
- Classification Column
- Special Characteristics
- Class Participant Workshop
- How to rate Severity for a Design FMEA

Determining Cause & Occurrence Ratings

- Cause Definition
- Cause Guidelines
- Assumptions when determining Causes
- Techniques for determining Causes
- Fault tree and Fishbone methodologies
- Classic Brainstorming
- Experience
- Experiments
- 5 Why's
- Cause Examples
- Occurrence Rating Definition

- FMEA Occurrence Table

Controls & Detection Rating

- Controls Definition
- Types of Design Controls
- Types of Process Controls
- Examples of Controls
- When Controls are implemented
- Detection Rating Defined
- FMEA Detection Rating Tables
- Class Participant Workshop

Assessing Risk

- Risk Defined
- The RPN
- Risk Patterns

Driving an Action Plan

- Recommended Action Definition
- The Action Plan
- Action Plan Results
- Documentations

Developing a Design FMEA

- How to clarify the scope for a Design FMEA
- Using the DFMEA Analysis to develop input for a Process Control Plan

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)

- Study of Centrifugal Pump Using Failure Mode Effect and Criticality Analysis Based on Cost Estimation before and after implementation of recommendations of FMECA study.
- Creating your own FMEA

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: **9-10 JULY 2018 AT MUMBAI**.

Participation fees: INR 20000/- per delegate (Excluding 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- 442001, MS, India; IFSC Code: IBKL0000509; Swift Code IBKLINBB007; MICR Code 442259001. (GST Code:27ABBPW5589J1ZV; SAC Code 99-9293; State Code 27; PAN No: ABBPW5589J)

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,

1. Vikas +91-8669546332; 7709012815; vikas@cisat.co.in; cisat.nagpur@gmail.com;
2. Mahendra Dhande 09168326662,

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

Centre For Industrial Solutions and Advanced Training

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With Best Regards and Thanks,