



## Risk Based Strategies for Inspection & Maintenance (RBI & RBM)

Date	Venues	(\$)Fees	Book your seat
05 May -09 May 2024	Kuala Lumpur	3300	<a href="#">Register Now</a>

### Introduction

Risk Based Inspection (RBI) methodology enables the assessment of the likelihood and potential consequences of pressure equipment failures. RBI provides companies the opportunity to prioritize their equipment for inspection; optimize inspection methods, frequencies and resources; develop specific equipment inspection plans; and enable the implementation of Reliability Centered Maintenance. This results in improved safety, lower failure risks, fewer forced shutdowns, and reduced operational costs.

#### The risk-based approach needs:

- To be multi-disciplined
- To be realistically applicable to plant integrity
- Design with future scenarios in mind
- Consideration of all potential degradation mechanisms
- Understanding of the risks involved
- Awareness of Fitness for Service assessment techniques

### Objectives

- To provide clear understanding of the key aspects of Risk Based Inspection, its advantages and limitations
- To provide a clear understanding of how it is linked to reliability-centered maintenance
- Understand how fitness-for-service assessment affects the Risk
- To show you how to develop a successful RBI program at your facility
- Provide you with the practical and effective methods you need to perform practical likelihood and consequence analysis
- Show you how to develop optimum Inspection intervals for individual equipment based on the assessment of the active degradation mechanisms

### Training Methodology

The course combines presentation of the key principles, methods, and best practices and enforces the learnings with case studies and Question & Answer workshops to maximize the benefits to the participants. The comprehensive course notes and presentation material will provide valuable reference.

### Organizational Impact

- Identification and assessment of active degradation mechanisms
- Implementation of a Risk Based Inspection program would result in significant measurable improvements improved plant integrity

- Fewer failures
- Optimization of inspection and maintenance plans and resources
- Reduction in operating costs

## Personal Impact

- Delegates will acquire the knowledge necessary to apply the risk-based methodology
- Delegates will acquire the skills necessary to apply the risk-based methodology
- Enhance competence in RBI
- Enhance performance level
- Contribute additional value to the organization

## Who Should Attend?

- Operations Engineers
- Maintenance Engineers
- Engineering managers and supervisors
- Technical staff with responsibilities for inspection, maintenance, assessment and mitigation of plant equipment degradation, and who want to use RBI effectively in their plants

## SEMINAR OUTLINE

### DAY 1

#### Course Objectives and Overview

- Significance of Inspection in Plant Integrity and Maintenance Costs
  - The real function of inspection
  - Inspection Key Performance Indicators
- Common Inspection Strategies and Their Limitations
- Risk-Based Decision-Making Fundamentals and Tools
  - Risk Assessment - Probability of failure, consequences of failure
  - Risk Management – Avoidance, mitigation
  - Risk Communication.
- Understanding and Managing Risk
  - Principles Risk Assessment
  - Risk Assessment Elements
  - Qualitative, semi-quantitative, and quantitative assessment
- Workshop 1- Illustrative Example of Risk Assessment

### DAY 2

#### Risk Based Inspection (RBI)

- Definitions
- Evolution
- Key Elements of RBI
- Reasons for implementing RBI
  - Benefits and Limitations of using RBI
  - RBI as a part of plant integrity management
  - Economic benefits
- API Risk-Based Inspection Methodology
  - API RP 580
  - API BRD 581 – Various levels of RBI Analyses

- Impact of RBI on Related API Codes, Standards, and Recommended Practices
  - API 510, 570 and 650
  - API 579 Fitness-For-Purpose
- API Risk Based Inspection Software
- Workshop 2 - Q&A on API RBI Methodology

## DAY 3

### Overview of API 571 - Recognition of Conditions Causing Deterioration of Failure

- Overview of over 60 damage mechanisms found in refineries
- Detailed discussion of some common damage mechanisms: Internal and external corrosion, brittle fracture, fatigue, SCC, HIC, internal and external corrosion
- Identification of Deterioration Mechanisms & Failure Modes
  - Active damage mechanisms in critical plant equipment
  - Inactive or “unlikely” mechanisms
  - Identification for assessment, including
  - Impact of simultaneous mechanisms
- Selection of Suitable Materials for Specific Deterioration Mechanisms
- Integrated Asset Management
  - Linking Risk Assessment, RBI, and RCM
  - Managing Risk Using RBI
- Workshop 3 - Case studies involving a number of equipment damage and failures, and learnings


## DAY 4


### Development of Inspection Plan (Based on RBI Risk Ranking)


- Inspection planning guidance
- Need for some speculative/exploratory inspection
- RBI Implementation
  - Essentials for Establishing a Successful RBI Program
  - The RBI Team - Recommended Structure and Mandate
- Developing Equipment and piping systems/circuits Inventory
- Inspection History, Interpretation
  - Equipment Criticality Rating
- Equipment Data Base
  - Shared data base by RBI and RCM
  - Importance of Data Quality
  - Computerized Maintenance Management Systems
- Workshop 4 – Case Study: Risk-based categorization of equipment and failure modes

## DAY 5

- Inspection Interval Optimization Based on Assessed Risk
- Evaluation of Inspection Results
  - Data Quality
  - Corrosion Rate calculations
  - Remaining Life Calculations
- Fitness-For-Service Assessments
- Estimation of Consequences of Failures
- Workshop 5 - Case Study - Assessment of defects in critical equipment

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