Training Course on Risk-Based Inspection (RBI) and Asset Integrity (HSE Focus)

Professional Development Training Course Outline

Category	Oil and Gas	**Duration**	10 Days
Base Fee	$3,000 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

In today’s competitive industrial landscape, maintaining operational safety while optimizing inspection resources is a strategic necessity. Training Course on Risk-Based Inspection (RBI) & Asset Integrity (HSE Focus) provides a robust framework for identifying high-risk assets, preventing failures, and ensuring compliance with Health, Safety, and Environmental (HSE) standards. This course provides in-depth exposure to industry best practices, regulatory requirements, and technological advancements aimed at achieving safe, reliable, and cost-effective asset performance.

This advanced training program emphasizes risk prioritization, condition-based monitoring, failure analysis, and predictive maintenance within the scope of asset lifecycle management. Using real-life case studies from oil & gas, petrochemical, and manufacturing sectors, the training ensures practical application and actionable learning for asset managers, inspection engineers, and HSE professionals.

Programme Curriculum

Training Course on Risk-Based Inspection (RBI) & Asset Integrity (HSE Focus)

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Course Objectives

1. Understand the fundamentals of Risk-Based Inspection (RBI) principles.
2. Apply RBI methodology to optimize inspection intervals and reduce failures.
3. Integrate RBI with Asset Integrity Management (AIM) strategies.
4. Analyze critical failure modes using FMEA and RCM techniques.
5. Leverage predictive analytics and real-time monitoring tools.
6. Ensure HSE compliance through proactive inspection planning.
7. Identify and mitigate corrosion-related asset degradation.
8. Establish KPI-driven decision-making for asset performance.
9. Evaluate fitness-for-service (FFS) assessment methods.
10. Develop RBI programs in alignment with API 580/581 standards.
11. Use risk matrices and probability-consequence modeling effectively.
12. Audit and assess asset integrity across the asset lifecycle.
13. Implement digital transformation in asset inspection and management.

Target Audience

1. Reliability Engineers
2. Maintenance Managers
3. HSE Officers
4. Inspection Engineers
5. Asset Integrity Engineers
6. Operations Managers
7. Risk Analysts
8. Plant Supervisors

Course Duration: 10 days

Course Modules

Module 1: Introduction to Risk-Based Inspection

- RBI principles and history
- Differentiation from time-based inspections
- Risk assessment terminology

- Inspection effectiveness vs. risk
- Overview of RBI standards (API 580/581)
- **Case Study: RBI implementation in an offshore platform**

Module 2: Asset Integrity Management (AIM) Fundamentals

- AIM concepts and definitions
- Asset hierarchy and criticality ranking
- Integration with maintenance strategies
- Integrity operating windows (IOWs)
- Data management for AIM
- **Case Study: Integrity breakdown in a chemical plant**

Module 3: RBI Planning and Risk Assessment

- Identifying damage mechanisms
- Probability of failure estimation
- Consequence analysis
- Risk matrix development
- Inspection planning and prioritization
- **Case Study: RBI-driven cost savings in refinery operations**

Module 4: Inspection Techniques and Tools

- Non-Destructive Testing (NDT) methods
- Condition monitoring technologies
- Fitness-for-service assessment
- RBI software overview
- Inspection data analysis
- **Case Study: NDT use in high-temperature environments**

Module 5: HSE Compliance and RBI

- Regulatory compliance frameworks
- Linking RBI to HSE performance
- Process safety integration
- Environmental risk factors
- Incident reporting and prevention
- **Case Study: HSE violations due to ignored RBI flags**

Module 6: Corrosion and Degradation Mechanisms

- Internal vs. external corrosion types
- Stress corrosion cracking
- Corrosion under insulation (CUI)
- Materials selection and compatibility
- Risk-based corrosion monitoring

- **Case Study: Pipeline rupture due to corrosion**

Module 7: API 580/581 Standard Deep Dive

- API 580 overview and scope
- Quantitative vs. qualitative RBI
- API 581 risk analysis methodology
- Data quality requirements
- Documentation and compliance
- **Case Study: API audit failure and corrective actions**

Module 8: Data Management in RBI

- Data collection and cleansing
- RBI database design
- Integration with CMMS/ERP
- Data visualization dashboards
- Audit trails and data governance
- **Case Study: Poor data quality causing misaligned inspection priorities**

Module 9: Predictive Analytics in RBI

- Condition-based monitoring
- Predictive modeling tools
- Using AI and ML in RBI
- Smart sensors and IIoT
- Decision-making through analytics
- **Case Study: Predictive failure detection in rotating machinery**

Module 10: Risk Mitigation and Optimization

- Reducing probability and consequence
- Using barriers and safeguards
- RBI optimization techniques
- Cost-benefit analysis
- Change management strategies
- **Case Study: Cost savings by switching to RBI from TBI**

Module 11: Root Cause Failure Analysis (RCFA)

- RCA process and tools
- Fault tree and fishbone diagrams
- Linking RCFA to RBI updates
- Incident recording and learning
- Human factor analysis
- **Case Study: Vessel explosion investigation and RCA**

Module 12: RBI in Shutdown and Turnaround Planning

- Role of RBI in TARs
- Shutdown risk prioritization
- Temporary risk acceptance
- Integration with TAR schedules
- Resource allocation
- **Case Study: RBI-guided turnaround at LNG facility**

Module 13: RBI Implementation Roadmap

- Stakeholder engagement
- Setting up RBI teams
- Pilot studies and scaling
- Governance models
- Training and competency building
- **Case Study: Multinational RBI rollout across facilities**

Module 14: Asset Integrity Auditing

- Internal and external audit procedures
- Performance metrics and KPIs
- Non-compliance rectification
- Continuous improvement
- Digital audit tools
- **Case Study: Integrity audit and legal implications**

Module 15: Digital Transformation of RBI

- Digital twins for asset monitoring
- Real-time inspection tracking
- Cloud-based RBI platforms
- Mobile inspection workflows
- Cybersecurity in asset data
- **Case Study: Full digital RBI migration at petrochemical site**

Training Methodology

- Interactive lectures with real-life industrial scenarios
- Hands-on case studies and group exercises
- Quizzes and knowledge checks per module
- RBI software tool demonstrations
- HSE integration workshops
- Certification and final assessment

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	04 Dec 2026	Online	$2,000
23 Nov 2026	04 Dec 2026	Physical	$3,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$9,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$12,000

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