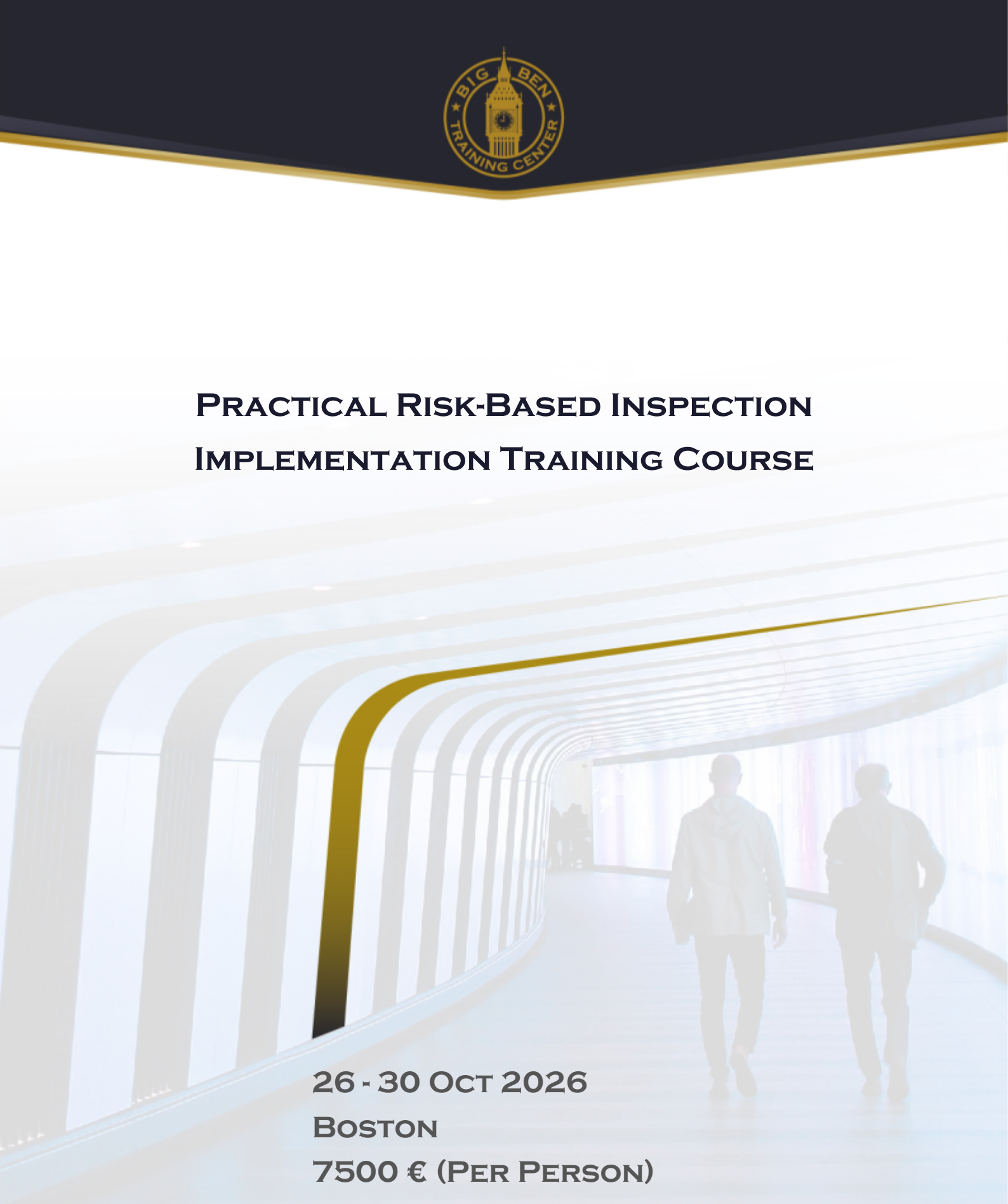
Practical Risk-Based Inspection Implementation Training Course



26 - 30 Oct 2026

Boston

7500 € (Per Person)

Ref: #INM1011_113062

Course Introduction / Overview:

Risk-Based Inspection (RBI) represents a paradigm shift in asset integrity management, moving away from reactive, time-based schedules to a proactive, data-driven strategy. This approach optimizes inspection resources by focusing on high-risk equipment, thereby enhancing safety, reducing operational risks, and improving plant reliability. This comprehensive course is designed to provide a complete roadmap for implementing a successful RBI program in industrial plants. Drawing upon foundational principles outlined in key industry standards like API 580 and API 581, the curriculum delves into both the theoretical underpinnings and the practical application of RBI methodologies. Participants will explore concepts championed by experts such as John Reynolds, a pivotal figure in the development of these standards. The course structure is meticulously crafted to guide attendees from understanding core concepts, such as Probability of Failure (PoF) and Consequence of Failure (CoF), to developing and executing detailed inspection plans. BIG BEN Training Center has developed this program to empower professionals with the skills to not only establish an RBI framework but also to sustain and continuously improve it, ensuring long-term asset performance and regulatory compliance. This is more than a theoretical overview; it is a practical guide to transforming your plant's maintenance and inspection strategy.

Target Audience / This training course is suitable for:

- Inspection Engineers and Managers.
- Reliability and Maintenance Engineers.
- Asset Integrity Managers.
- Plant and Operations Managers.
- Process Safety Professionals.
- Corrosion and Materials Engineers.
- Non-Destructive Testing (NDT) Technicians and Supervisors.
- Project Engineers involved in plant modifications.
- Regulatory Compliance Officers.

Target Sectors and Industries:

- Oil and Gas (Upstream, Midstream, and Downstream).
- Petrochemical and Chemical Processing Plants.
- Power Generation (Fossil, Nuclear, and Renewables).
- Pharmaceutical Manufacturing.
- Pulp and Paper Mills.
- Mining and Mineral Processing.
- Fertilizer Plants.
- Governmental bodies and regulatory agencies.

Target Organizations Departments:

- Inspection and Non-Destructive Testing (NDT).
- Maintenance and Reliability.
- Engineering and Technical Services.
- Asset Integrity Management.
- Health, Safety, and Environment (HSE).
- Operations and Production.
- Process Safety Management (PSM).
- Project Management.

Course Offerings:

By the end of this course, the participants will have able to:

- Develop a robust business case for implementing an RBI program.
- Master the fundamental principles and methodologies of API 580 and API 581.
- Conduct systematic Probability of Failure (PoF) and Consequence of Failure (CoF) assessments.
- Identify and analyze potential damage mechanisms affecting plant equipment.
- Create and interpret a risk matrix to prioritize inspection activities.
- Design optimized inspection plans based on calculated risk levels.
- Select appropriate NDT techniques for different types of equipment and damage.
- Integrate RBI findings with Fitness-for-Service (FFS) assessments.
- Establish a framework for managing and updating RBI data effectively.
- Audit and continuously improve an existing RBI program for sustained performance.

Course Methodology:

The training methodology at BIG BEN Training Center is designed to be highly interactive, engaging, and practical, ensuring that participants can immediately apply their learning in the workplace. This course moves beyond traditional lectures by incorporating a blended learning approach. Expert-led presentations will establish the theoretical foundations of Risk-Based Inspection, supported by detailed explanations of API standards and industry best practices. A significant portion of the training is dedicated to hands-on workshops and group exercises where participants will work on real-world case studies from the oil and gas and petrochemical sectors. These activities include developing risk matrices, calculating risk for sample equipment, and creating mock inspection plans. Collaborative sessions encourage peer-to-peer learning and the sharing of diverse industry experiences. Interactive Q&A segments are integrated throughout the course to address specific challenges and queries from participants. The program emphasizes a problem-solving approach, equipping attendees not just with knowledge, but with the critical thinking skills required to build, implement, and manage a successful RBI program from start to finish. Continuous feedback from the instructor ensures a deep and lasting understanding of the material.

Course Agenda (Course Units):

Unit One: Foundations of Risk-Based Inspection (RBI)

- Introduction to Asset Integrity Management.
- Evolution from Time-Based to Risk-Based Inspection.
- Core Principles and Objectives of RBI.
- Understanding API 580 Recommended Practice for RBI.
- The Business Case and Benefits of Implementing RBI.
- Key Terminology and Definitions in RBI.
- Roles and Responsibilities in an RBI Team.

Unit Two: Risk Analysis and Assessment

- The Concept of Risk.
- Probability of Failure (PoF) Analysis.
- Identifying and Evaluating Damage Mechanisms.
- Consequence of Failure (CoF) Analysis.
- Data Requirements for a Credible RBI Assessment.
- Qualitative, Semi-Quantitative, and Quantitative RBI Approaches.
- Developing and Calibrating the Risk Matrix.

Unit Three: Developing the RBI Inspection Plan

- Establishing Risk Acceptance Criteria.
- Using the Risk Matrix to Prioritize Equipment.
- Defining Inspection Strategies for Different Risk Levels.
- Determining Appropriate Inspection Intervals.
- Selecting Effective Non-Destructive Testing (NDT) Techniques.
- Documenting the RBI Plan and Inspection Work Scopes.
- Managing Risk Mitigation Actions.

Unit Four: RBI Implementation and Data Management

- Executing the RBI-Driven Inspection Plan.
- Techniques for Effective Inspection Data Collection.
- Managing and Analyzing Inspection Findings.
- Introduction to Fitness-For-Service (FFS) Assessments (API 579).
- Updating the RBI Plan Based on Inspection Results.
- The Role of RBI Software and Technology.
- Challenges and Pitfalls in RBI Implementation.

Unit Five: Sustaining and Improving the RBI Program

- Integrating RBI with other Reliability Programs (RCM, PSM).
- Key Performance Indicators (KPIs) for an RBI Program.
- Conducting Audits and Management Reviews of the RBI Process.
- Managing Organizational Change for RBI Adoption.
- Living RBI Program.
- Future Trends in RBI and Asset Performance Management (APM).
- Comprehensive Course Review and Final Q&A Session.

FAQ:

Qualifications required for registering to this course?

There are no requirements.

How long is each daily session, and what is the total number of training hours for the course?

This training course spans five days, with daily sessions ranging between 4 to 5 hours, including breaks and interactive activities, bringing the total duration to 20 - 25 training hours.

Something to think about:

How can an organization effectively manage the cultural shift from a traditional, compliance-driven inspection mindset to a proactive, risk-based integrity management philosophy?

What unique qualities does this course offer compared to other courses?

This course distinguishes itself by focusing intensely on the practical implementation of a Risk-Based Inspection program, rather than merely covering theoretical concepts. While many courses explain what RBI is, this program is structured as a step-by-step guide on how to build, execute, and sustain a world-class RBI framework within your organization. It bridges the gap between understanding API standards and applying them in complex industrial environments. The curriculum is enriched with real-world case studies drawn from diverse sectors, allowing participants to analyze actual failures and successful mitigation strategies. This practical emphasis ensures that attendees learn not just the methodology but also the nuances of data collection, risk analysis, and decision-making. Furthermore, the course offered by BIG BEN Training Center is designed to foster critical thinking, encouraging participants to challenge conventional approaches and tailor RBI strategies to their specific operational context. It emphasizes the integration of RBI with other critical systems like Process Safety Management and Fitness-for-Service, providing a holistic view of asset integrity that is crucial for achieving operational excellence, safety, and long-term profitability. The interactive format and expert instruction provide a dynamic learning environment for mastering this critical discipline.