



API 580/581 RISK BASED INSPECTION PROFESSIONAL CERTIFICATION PREPARATION PROGRAM

COURSE DURATION: 4 DAYS

An intensive course with daily homework & a final exam (similar to API 580 exam); special emphasis on the use of related codes, probability & estimations. Study Guide is provided for pre-class study.

COURSE DESCRIPTION

Risk Based Inspection (RBI) has quickly become one of the industry's premiere instruments and preferred methods of inspection. The API 580 Advanced Risk Based Inspection Professional program is designed to enhance the knowledge of RBI among specialized inspectors, engineers and other professionals across the entire petrochemical industry.

This course is the **first step** for people who are interested in Risk-Based Inspection (RBI). The fundamental concepts of RBI and its reliance on **understanding damage mechanisms (API 571)** and **fitness for service concepts (API 579)** will be introduced.

The intended purpose of this course is to prepare the student for the API 580 examination (Risk Based Inspection).

NOTE: This is an introductory course for people with **little or no experience with RBI**. This will cover the BASIC organization and concepts of Risk Based Inspection.

YOUR PLANT ASSETS ARE WORTH MILLIONS / BILLIONS... DO NOT TAKE RISKS!!

It's also about Safety, Reliability, Availability & Minimizing Liability of Fixed Equipment

The course explains feasible means and alternatives for achieving a successful RBI program without undue complications. It deals with RBI framework and methodology in a simple straight forward manner to establish and implement a risk-based inspection program best suited for the company objectives. Its utility is based on the premise that a few vital pieces of equipment in a process plant contributes a majority of the risk. Consequently, if this high risk equipment can be identified, then testing and inspection can be focused on them rather than several low-risk items.

RBI helps to prioritize equipment for inspection, optimize inspection methods and frequencies, and develop effective inspection plan commensurate with the risk contribution and equipment condition.

COURSE OBJECTIVES

The course provides participants with the knowledge necessary to:

- ✓ Explain why RBI analysis is used, the benefits & limitations of various RBI technologies.
- ✓ Understand the types of RBI assessments, consequence & probability, management of risks & determine the relationship between RBI and other risk-based / safety programs.
- ✓ Prepare RBI plans, practical likelihood & consequence analysis, optimize maintenance & inspection intervals.
- ✓ Develop an understanding on risk management with inspection activities.
- ✓ Determine the need to conduct a RBI reassessment, its process and updates.
- ✓ Recommend suitable risk mitigation actions such as equipment modification, redesign & rerating, emergency isolation, inventory reduction, blast-resistant construction & more.
- ✓ Know the various roles, responsibilities, training and qualification for RBI application.
- ✓ Effectively utilize API 581 to calculate Probability of Failure and Consequence of Failure in effort to quantify risk for an asset.
- ✓ Understand concepts and principles of Risked-based Inspection for risk management.



WHO SHOULD ATTEND?

- Refining and Petrochemical Engineers & Inspectors.
- Individuals who are responsible for implementing risk-based inspection programs within the company or plant facility.
- Plant Engineers, Non-Destructive Testing Engineers, Materials & Corrosion Engineers, Plant Inspectors responsible for managing the integrity of ageing process equipment, pipelines, boilers and storage tanks.
- Maintenance personnel, operations supervisors, and process specialists who are expected to make decisions regarding the suitability of equipment for continued service.
- Engineers and inspection personnel from the pulp and paper, oil and natural gas, and chemical industries may also find the course beneficial. A working knowledge of basic equipment is recommended.



COURSE OUTLINE

DAY 1

Course Introduction

- API 580 RP Introduction
- API 581 RP Introduction

Module 1

- API 580 Sec. 1 - Purpose
- API 580 Sec. 2 - Scope
- API 580 Sec. 4 - Terms, Definitions, Acronyms and Abbreviations
- API 580 Sec. 5 - Basic Risk Assessment Concepts
- API 580 Sec. 6 - Introduction to Risk-Based Inspection
- API 581 Part 1 Sec. 1 – Scope
- API 581 Part 1 Sec. 4 - API RBI Concepts

Module 2

- API 580 Sec. 7 - Planning the RBI Assessment
- API 580 Sec. 8 - Data and Information Collection for RBI Assessment

DAY 2

Module 3

- API 580 Sec. 9 - Damage Mechanisms and Failure Modes
- API 580 Sec. 10 - Assessing Probability of Failure (POF)
- API 581 Part 1 Sec. 4.1 - Probability of Failure
- API 581 Part 2 Sec. 4 - Probability of Failure Calculations
- API 581 Part 2 Sec. 5 - Thinning Damage Factor
- API 581 Part 2 Sec. 14 - SCC Damage Factor
- API 581 Part 2 Sec. 15 - SCC Damage Factor – HIC/SOHIC-HF
- API 580 Sec. 11 - Assessing Consequences of Failure (COF)
- API 581 Part 1 Sec. 4.2 - Consequence of Failure
- API 581 Part 3 Sec. 5 - Consequence Analysis – Level 1

MODULE 4

- Assessing Probability of Failure (POF)
- Assessing Consequences of Failure (COF)



Note

No required class pre-requisites. However, if you wish to pursue the API Certification Exam, a minimal years of experience on subject matter is required depending on your educational qualifications.

Please refer to the Exam Qualification Requirements at:

www.api.org/icp



DAY 3

Module 5

- API 580 Sec. 12 - Risk Determination, Assessment and Management
- API 581 Part 1 Sec. 4.3 - Risk Analysis
- API 580 Sec. 13 - Risk Management with Inspection Activities
- API 581 Part 1 Sec. 4.4 - Inspection Planning Based on Risk Analysis
- API 581 Part 2 Sec. 4.4.3 - Inspection Effectiveness Category
- API 580 Sec. 14 - Other Risk Mitigation Activities
- API 580 Sec. 15 - Reassessment and Updating RBI Assessments

DAY 4

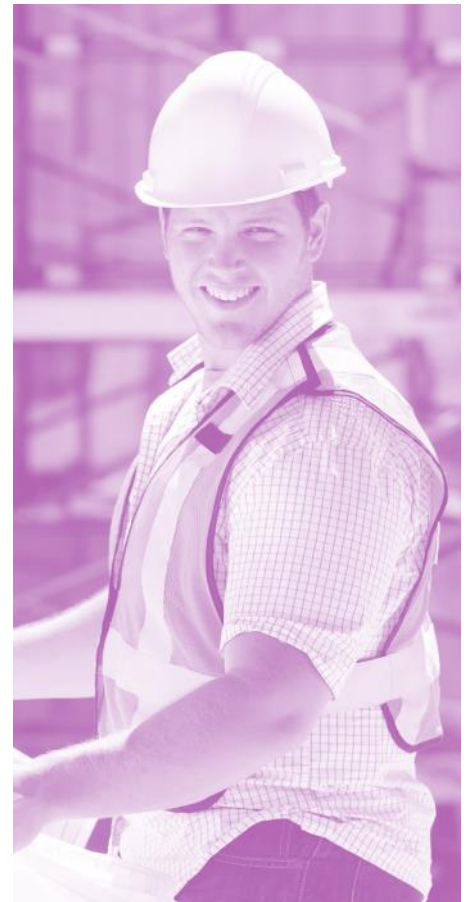
Module 6

- API 580 Sec. 16 - Roles, Responsibilities, Training and Qualifications
- API 580 Sec. 17 - RBI Documentation and Recordkeeping

MODULE 7

- Reassessment and Updating RBI Assessments
- Roles, Responsibility, Training & Qualifications
- RBI Documentation and Recordkeeping

Final Exam



COURSE DURATION

- 4 Days Training

DAILY SCHEDULE

- 8:30am - 5:30pm (Workshop)

ITEMS TO BRING

- Lots of Questions
- A "CAN-DO" Attitude
- Codes / Standards
(in soft / hard copy)
- * **API 580**
- * **API 581 (Optional)**

Stationeries such as pen and highlighter will be provided.





TRAINER'S PROFILE

MURRY FUNDERBURG

Murry Funderburg has been an expert for more than 40 years in the fields of materials engineering, failure analysis and inspection.

His experience includes materials selection, failure analysis, reliability assessment, and testing of equipment found in petrochemical (downstream and upstream), chemical (chlorinated hydrocarbons, inorganic and organic acids, pharmaceuticals), pollution control (thermal oxidizers, carbon bed absorbers), and equipment manufacturing (heat exchangers, air coolers, desalination) facilities.

Since 1999, Murry has been a Corrosion/Materials Engineering Specialist with Shell Oil Products, US, and he leads API certification training courses for Pinnacle Asset Integrity Services.

TECHNICAL QUALIFICATIONS

Murry holds numerous Technical certifications including:

- ✓ API 510 Certification Preparation "Pressure Vessel Inspection"
- ✓ API 570 Certification Preparation "In-Service Piping"
- ✓ ASME IX "Welding Qualifications" Code Simplified
- ✓ ASME VIII Division 1 "Pressure Vessel" Code Simplified
- ✓ Professional Engineer, Metallurgy
- ✓ NACE International Corrosion Specialist
- ✓ NACE International Materials Selection

SPECIAL SKILLS

- Inspector for periodic inspection & certification of Pressure vessels, Piping Systems, storage tanks and steam boilers.
- Inspector for third party & welding inspection and QA/QC in manufacturing/construction of Pressure vessels, Steam Boilers, Piping Systems
- Specialist in the application of advanced technologies for inspection, corrosion testing and failure analysis

EDUCATIONAL QUALIFICATIONS

- Master of Science, Materials Science and Engineering (1973, Vanderbilt University, Nashville, Tennessee)
- Bachelor of Engineering, Material Engineering (1973, Vanderbilt, University Nashville, Tennessee)
- Master of Business Administration, Finance, (University of Connecticut, Storrs Connecticut)