



COURSE OVERVIEW FE0920
API 580: Risk Based Inspection
(API Exam Preparation Training)

Course Title

API 580: Risk Based Inspection
(API Exam Preparation Training)

Course Date/Venue

December 15-19, 2024/Sharjah Meeting Room, The Tower Plaza Hotel, Dubai, UAE

Exam Window/Venue

April 11-May 02, 2025/Abu Dhabi, Dubai, Al-Khobar, Jeddah, Kuwait, Amman, Beirut, Cairo, Manama and Muscat. Participant has the option to attend at any of the above cities

Exam Registration Closing Date

January 31, 2025

Course Reference

FE0920

Course Duration/Credits

Five days/4.0 CEUs/40 PDHs



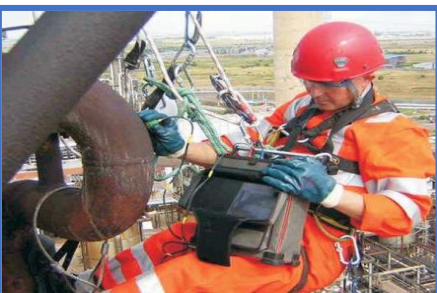
Course Description



This practical and highly-interactive course includes various practical sessions and exercises. Theory learnt will be applied using our state-of-the-art simulators.



The API 580 Risk-Based Inspection (RBI) certification exam tests the individual's knowledge of RBI techniques, based on the practices and principles outlined in API Recommended Practice 580 (Risk-Based Inspection) and API Standard 581 (Risk-Based Inspection Technology).



This course is designed to train individuals who are interested in obtaining the API 580 RBI Inspector Certification, as well as those who are seeking an advanced knowledge of Risk Based Inspection requirements. Included with the course is a pre-study guide and student classroom workbook. The student receives instruction regarding how to take the test, as well as insight into the intricacies of "real world" situations. Daily tests are designed to gauge students' proficiency and understanding of the material.

Haward Technology is proud of its **90% pass rate** on all our API sponsored courses.





Further, the course will also discuss the importance of risk-based inspection (RBI) in industry and the goals and benefits of RBI program; the qualitative, semi-quantitative and quantitative methods; the selection criteria for RBI methodology and integration of RBI into inspection programs; the basic concepts of risk, risk matrix and risk ranking and API 581 risk assessment procedures; the common damage mechanisms in the refining and petrochemical industry; the impact of damage mechanisms on risk assessment; the equipment and circuits for RBI; the data collection and documentation for RBI and integration of plant inspection data; the relevant API standards (API 510, 570, 653) and the legal and regulatory framework affecting RBI; the probability of failure (POF) and consequence of failure (COF); the RBI inspection techniques, non-destructive testing (NDT) methods and selection of appropriate NDT methods based on risk; developing inspection planning and scheduling; and the data quality and management in RBI assessment.

During this interactive course, participants will learn the software tools for RBI, RBI program and RBI program maintenance; the risk communication and reporting, performance measurement and improvement; the RBI program audit and review; the quantitative risk assessment (QRA) and reliability-centered maintenance (RCM); the life cycle cost analysis and advanced inspection technologies; the human factors in risk assessment and organizational culture and its impact on RBI effectiveness; incorporating safety and environmental risks; and the compliance with safety and environmental regulations.

Course Objectives

Upon the successful completion of this course, each participant will be able to:-

- Get prepared for the next API 580 exam and have enough knowledge and skills to pass such exam in order to get the API 580 Inspector certificate
- Discuss API 580 including the importance of risk-based inspection (RBI) in industry and the goals and benefits of RBI program
- Carryout qualitative, semi-quantitative and quantitative methods including the selection criteria for RBI methodology and integration of RBI into inspection programs
- Identify the basic concepts of risk, risk matrix and risk ranking and API 581 risk assessment procedures
- Recognize the common damage mechanisms in the refining and petrochemical industry and the impact of damage mechanisms on risk assessment
- Identify the equipment and circuits for RBI as well as apply data collection and documentation for RBI and integration of plant inspection data
- Discuss the relevant API standards (API 510, 570, 653) and the legal and regulatory framework affecting RBI
- Explain the probability of failure (POF) and consequence of failure (COF)
- Apply RBI inspection techniques, non-destructive testing (NDT) methods and selection of appropriate NDT methods based on risk
- Develop inspection planning and scheduling and apply data quality and management in RBI assessment
- Use software tools for RBI, develop RBI program and implement RBI program maintenance
- Employ risk communication and reporting, performance measurement and improvement and RBI program audit and review
- Carryout quantitative risk assessment (QRA) and reliability-centered maintenance (RCM)



- Illustrate life cycle cost analysis covering cost-benefit analysis for inspection interventions and economic modeling of RBI decisions
- Apply advanced inspection technologies and identify human factors in risk assessment and organizational culture and its impact on RBI effectiveness
- Incorporate safety and environmental risks and comply with safety and environmental regulations

Who Should Attend

This course is designed for those involved in risk based inspection methodologies and practices in refineries, gas, oil and petrochemical facilities. This includes inspection engineers and inspectors who are seeking API-580 certification. Other engineers, inspectors, maintenance staff, facility integrity personnel and asset managers who are considering or implementing risk based inspection systems will definitely benefit from this course.

Exam Eligibility & Structure

Exam candidates shall have the following minimum pre-requisites:-

Education	Years of Experience	Experience Required
BS or higher in engineering or technology	1 year	Any experience in the petrochemical industry
2-year degree or certificate in engineering or technology	2 years	Any experience in the petrochemical industry
High school diploma or equivalent	3 years	Any experience in the petrochemical industry
No formal education	5 or more years	Any experience in the petrochemical industry

Required Codes & Standards

Listed below are the effective editions of the publications required for this exam for the date(s) shown above. **Each student must purchase these documents separately and have them available for use during the class as their cost is not included in the course fees:-**

- API Recommended Practice 580 (Risk-Based Inspection): This document provides guidance on developing a risk-based inspection (RBI) program for fixed equipment and piping in the petrochemical industry.
- API Standard 581 (Risk-Based Inspection Technology): Provides the quantitative procedures to establish an inspection program using risk-based methods for assessing and managing the risk of equipment failure in hydrocarbon and chemical process facilities.
- API Recommended Practice 571 (Damage Mechanisms Affecting Fixed Equipment in the Refining Industry): While not the primary focus, understanding the common damage mechanisms presented in this document is crucial for identifying risks and making informed decisions in an RBI program.

Note: API and ASME publications are copyrighted material. Photocopies of API and ASME publications are not permitted.



Certificate Accreditations

Certificates are accredited by the following international accreditation organizations:

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The International Accreditors for Continuing Education and Training (IACET - USA)

Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

Haward Technology’s courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units (CEUs)** in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

Haward Technology Middle East will award **4.0 CEUs** (Continuing Education Units) or **40 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant’s involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant’s CEU and PDH Transcript of Records upon request.

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British Accreditation Council (BAC)

Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours:-

- 30% Lectures
- 20% Practical Workshops & Work Presentations
- 30% Hands-on Practical Exercises & Case Studies
- 20% Simulators (Hardware & Software) & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.



Course Instructor(s)

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:



Mr. Reda Hassan is a **Senior Inspection Engineer** with over **20 years** of extensive experience within the **Oil, Gas, Refinery and Petrochemical** industries. His expertise widely evolves in **Vibration System & System One/Bentley Nevada**, Risk Based Inspection (RBI) **API 580/581**, Fitness For Service (F.F.S), **Life Extension Analysis**, Risk-Based Inspection (RBI); **Tank Inspection**; **Pressure Vessel Inspection**; **Piping Inspection**; **Construction, Installation Fabrication, Erection, Inspection, Maintenance, Operation, Rating, Repair, Alteration, Reconstruction, Pigging, Integrity Assessment, Flaw Evaluation, fitness-for-service (FFS) of Piping, Piping Inspection, Pipelines, Tanks, Fuel Storage Tanks, Boiler, Pressure Vessel, Pigging, Pump & Valve Technology, Centrifugal Pump, Machinery Bearings & Lubrication, Hydraulics, Welding Technology, Non-Destructive Testing (NDT), Cathodic Protection of Pipelines, Maintenance of Rotating Machinery and Maintenance Management & Planning**. Further, he is also well-versed in various **international codes and standards** such as **API 570, API 620, API 650, API 653, API 510, API 580, API 598, API 1104, ASME B31, ASME B31.3 and ASME B31.8**. Currently, he is the **Engineering Head of GUPCO BP (British Petroleum)**.

During his career life, Mr. Reda has worked with numerous multi-national companies such as **GUPCO BP, Saipaim Engineering, Tractebel Engineering Suez, Story TransGas (STG) and SGC** for international clients as the **Technical Consultant & Trainer, Section Head Projects Engineer, Maintenance & QC Engineer, Mechanical Supervisor and NDT Supervisor**.

Mr. Reda has a **Bachelor** degree in **Mechanical Engineering**. He is a **Certified Tank Inspector (API-653)**, a **Certified Pressure Vessel Inspector (API-510)**, **Certified Piping Inspector (API-570)**, a **Certified Risk Based Inspector (API-580)** as well as a **Certified ASNT Level II** in Radiographic Testing (RT), Ultrasonic Testing (UT), Magnetic Particle Testing (MT) and Liquid Penetrate Testing (PT). Further, he is on the process of completing the **PMP-PMI certification** and he has delivered numerous technical courses, trainings and workshops worldwide.

Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

Training Fee

US\$ 5,500 per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Exam Fee

US\$ 550 per Delegate + **VAT**.



Course Program

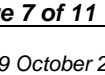
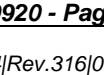
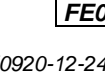
The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1: Sunday, 15th of December 2024

0730 – 0800	Registration & Coffee
0800 – 0815	Welcome & Introduction
0815 – 0830	PRE-TEST
0830 – 0930	Introduction to API 580 & Risk-Based Inspection (RBI) Overview of API 580 • Importance of RBI in Industry • Goals & Benefits of Implementing an RBI Program
0930 – 0945	Break
0945 – 1100	Risk-Based Inspection Methodologies Qualitative, Semi-Quantitative & Quantitative Methods • Selection Criteria for RBI Methodology • Integration of RBI into Inspection Programs
1100 – 1200	Risk Assessment & API 581 Basic Concepts of Risk: Likelihood & Consequence • Risk Matrix & Risk Ranking • Introduction to API 581 Risk Assessment Procedures
1200 – 1300	Lunch
1300 – 1430	Damage Mechanisms (API RP 571) Common Damage Mechanisms in the Refining & Petrochemical Industry • Impact of Damage Mechanisms on Risk Assessment
1430 – 1530	Planning & Scoping for RBI Identifying Equipment & Circuits for RBI • Data Collection & Documentation for RBI Assessment • Integration with Plant Inspection Data
1530 – 1545	Break
1545 – 1645	Regulatory & Industry Standards for RBI Overview of Relevant API Standards (API 510, 570, 653) • Legal & Regulatory Framework Affecting RBI
1645 – 1700	Recap Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow
1700	End of Day One

Day 2: Monday, 16th of December 2024

0730 – 0830	Review of Day 1
0830 – 0930	Probability of Failure (POF) Factors Affecting POF • Inspection History & POF • Data Analysis & Interpretation
0930 – 0945	Break
0945 – 1100	Consequence of Failure (COF) Safety, Environmental & Financial Impacts • COF Calculation Methodologies
1100 – 1200	RBI Inspection Techniques Non-Destructive Testing (NDT) Methods • Selection of Appropriate NDT Methods Based on Risk
1200 – 1300	Lunch
1300 – 1430	Inspection Planning & Scheduling Prioritizing Inspection Activities Based on Risk • Developing Inspection Plans & Schedules
1430 – 1530	Data Quality & Management Importance of Data Quality in RBI Assessment • Data Management Practices & Tools





1530 – 1545	Break
1545 – 1645	Software Tools for RBI <i>Overview of Available RBI Software • Criteria for Selecting RBI Software</i>
1645 – 1700	Recap <i>Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow</i>
1700	End of Day Two

Day 3: Tuesday, 17th of December 2024

0730 – 0830	Review of Day 2
0830 – 0930	Developing an RBI Program <i>Steps to Implement an RBI Program • Integration with Existing Asset Management Systems</i>
0930 – 0945	Break
0945 – 1100	RBI Program Maintenance <i>Review & Update of RBI Assessments • Managing Changes in Process Conditions or Equipment</i>
1100 – 1200	Case Studies: Implementing RBI <i>Examples of Successful RBI Implementation • Lessons Learned & Best Practices</i>
1200 – 1300	Lunch
1300 – 1430	Risk Communication & Reporting <i>Communicating Risk to Stakeholders • Reporting Requirements & Formats</i>
1430 – 1530	Performance Measurement & Improvement <i>Key Performance Indicators (KPIs) for RBI Programs • Continuous Improvement in RBI Processes</i>
1530 – 1545	Break
1545 – 1645	RBI Program Audit & Review <i>Audit Objectives & Methodologies • Addressing Findings & Implementing Corrective Actions</i>
1645 – 1700	Recap <i>Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow</i>
1700	End of Day Three

Day 4: Wednesday, 18th of December 2024

0730 – 0830	Review of Day 3
0830 – 0930	Advanced Risk Assessment Techniques & Management <i>Quantitative Risk Assessment (QRA) • Detailed Methodologies for QRA • Case Studies on QRA Application</i>
0930 – 0945	Break
0945 – 1100	Reliability-Centered Maintenance (RCM) & RBI <i>Integrating RCM with RBI • Optimizing Maintenance Strategies Based on Risk</i>
1100 – 1200	Life Cycle Cost Analysis <i>Cost-Benefit Analysis for Inspection Interventions • Economic Modeling of RBI Decisions</i>
1200 – 1300	Lunch
1300 – 1430	Advanced Inspection Technologies <i>Latest Advancements in NDT & Inspection Technologies • Application of Advanced Technologies in RBI</i>
1430 – 1530	Human Factors & Organizational Impact on RBI <i>Role of Human Factors in Risk Assessment • Organizational Culture & its Impact on RBI Effectiveness</i>



1530 – 1545	Break
1545 – 1645	Safety & Environmental Considerations in RBI Incorporating Safety & Environmental Risks • Compliance with Safety & Environmental Regulations
1645 – 1700	Recap Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow
1700	End of Day Four

Day 5: Thursday, 19th of December 2024

0730 – 0830	Review of Day 4
0830 – 0930	Review & Exam Preparation Review of API 580 & 581 Key Concepts • Critical Elements of API 580 & 581 • Recap of Main Topics & Principles
0930 – 0945	Break
0945 – 1100	Sample Exam Questions & Discussion Reviewing Sample Questions • Discussion on Approaches to Answering Questions
1100 – 1230	Exam Strategies & Time Management Tips for Effective Exam Preparation • Strategies for Managing Time During the Exam
1230 – 1330	Lunch
1330 – 1500	Case Study Workshop Group Discussion on a Comprehensive RBI Case Study • Practical Application of RBI Concepts & Methodologies
1500 – 1515	Break
1515 – 1615	Open Q&A Session Addressing any Remaining Questions & Clarifications • Sharing Resources for Further Study
1615 – 1630	Course Conclusion Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course
1630 – 1645	POST-TEST
1645 – 1700	Presentation of Course Certificate
1700	End of Course

MOCK Exam

Upon the completion of the course, participants have to sit for a MOCK Examination similar to the exam of the Certification Body through Haward’s Portal. Each participant will be given a username and password to log in Haward’s Portal for the MOCK Exam during the 30 days following the course completion. Each participant has only one trial for the MOCK exam within this 30-day examination window. Hence, you have to prepare yourself very well before starting your MOCK exam as this exam is a simulation to the one of the Certification Body.



Simulator (Hands-on Practical Sessions)

Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using the state-of-the-art simulator “RiskWISE” and “IntegriWISE™”.

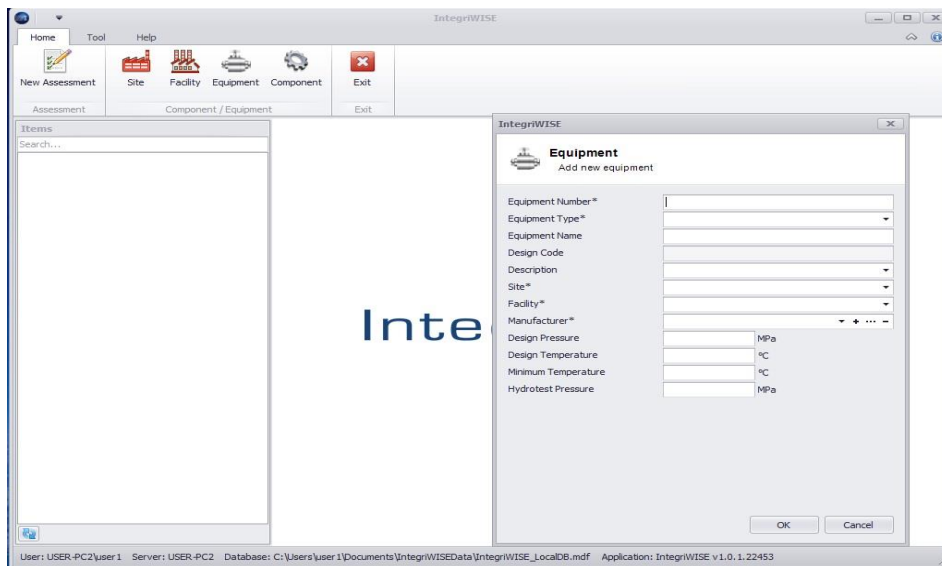
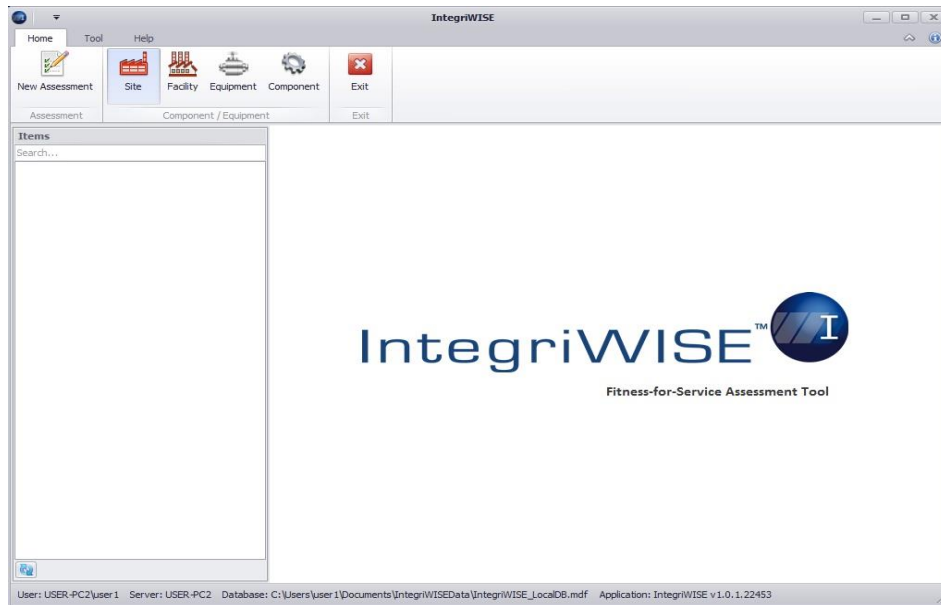
The screenshot displays the RiskWISE software interface. The main window is titled "Risk Analysis - RiskWISE® 6 for Process Plant (License Expiry Date: 18-Nov-2039)". The interface includes a menu bar (Home, Settings, Tools, Components, Help), a toolbar (New, Save, Exit), and a sidebar with navigation options like Home, Recommended Proposals, Current Revisions, Risk Analysis, Inspection / Mitigation Planning, Inspection / Mitigation Schedule, and Archived Equipment Records.

The central area shows a "Risk Matrix" with a grid of colored cells representing risk levels. The Y-axis is labeled "Probability of Failure" (ranging from 1 to 5) and the X-axis is labeled "Consequence" (ranging from A to E). A legend indicates that AP1 is represented by a blue circle, AP2 by a green diamond, and AP3 by a red triangle.

To the right of the matrix is a "Records" table with the following columns: Site, Facility, Equipment Number, Component Number, AP1, and AP2. The table is currently empty.

At the bottom of the window, the status bar shows: "User: HAWARD\adnan Application: RiskWISE® 6 for Process Plant v5.1.36681.0 Server: BD008 Database: C:\Users\adnan\Documents\RiskWISE6\data\RiskWISE6ProcessData.mdf".

RiskWISE



IntegriWISE™

Course Coordinator

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