COURSE OVERVIEW FE0920
API 580 Risk Based Inspection

Course Title
API 580 Risk Based Inspection

Course Date/Venue
Session 1: August 04-08, 2024/SAS Meeting Room, Holiday Inn Muscat al Seeb, an IHG Hotel, Muscat, Oman
Session 2: December 15-19, 2024/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE

Exam Window/Venue
December 06-27, 2024/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
September 27, 2024

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

Exclusive Smart Training Kit - H-STK®

*Participants of this course will receive the exclusive "Haward Smart Training Kit" (**H-STK®**). The **H-STK®** consists of a comprehensive set of technical content which includes **electronic version** of the course materials conveniently saved in a **Tablet PC**.*

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.**

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.

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.

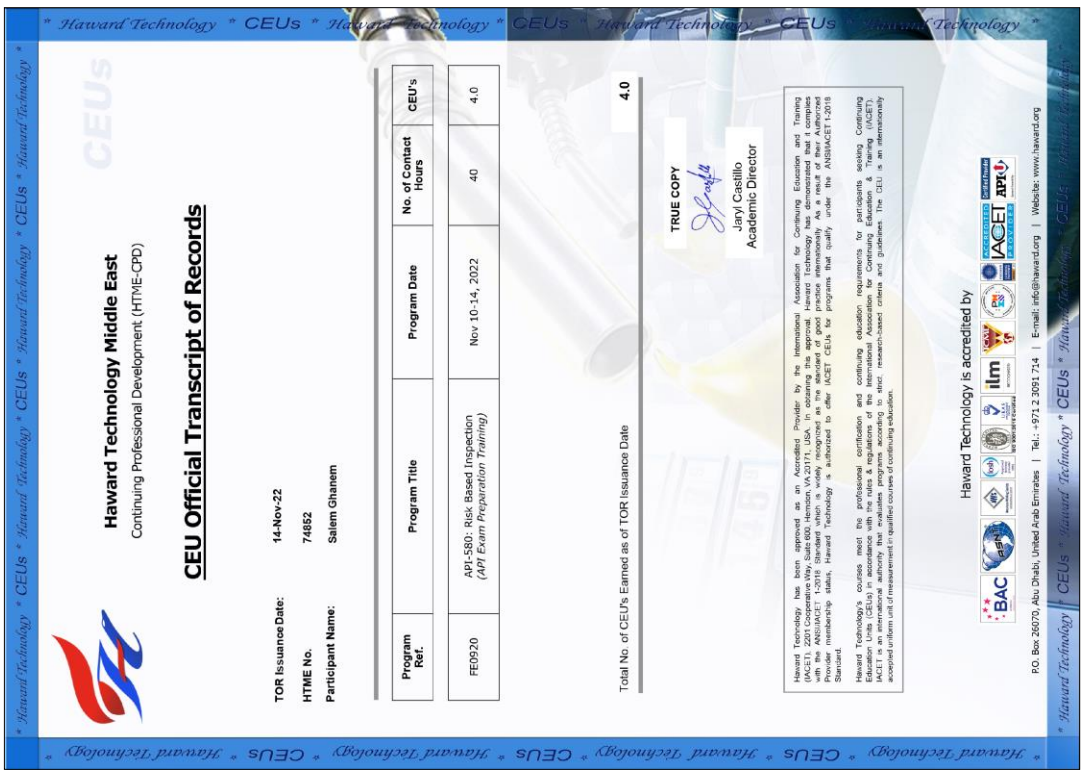
Exam Fee

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

API Certificate(s)

API-580 certificate will be issued to participants who have successfully passed the API-580 examination.

(2) Official Transcript of Records will be provided to the successful delegates with the equivalent number of ANSI/IACET accredited Continuing Education Units (CEUs) earned during the course.



Certificate Accreditations

Certificates are accredited by the following international accreditation organizations:

- 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.

- 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.

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. Steve Murphy (**UK**) is a **Senior Inspection Engineer** with almost **30 years** of extensive industrial experience within the **Oil & Gas**, **Refinery** and **Petrochemical** industries. His expertise widely covers in the areas of **Pressure Vessel Inspection** (**API 510**), **Piping Inspection** (**API 570**), **Risk Based Inspection** (**API 580**), **Damage Mechanisms** (**API 571**), **Aboveground Storage Tank Inspection** (**API 653**), **Asset Integrity** Management, **Welding & Fabrication**, **Piping Inspection**, **Pipelines**, Risk-Based Inspection (**RBI**), Fitness-for-Service (**FFS**), Asset Integrity Management (**AIM**), **Plant Inspection & Corrosion** Engineering, **Metallurgy**, **Corrosion** & **Prevention of Failures**, **Material** Selection & Properties, **Welding** Technology, Welded Steel Tanks for Oil Storage, **Cathodic Protection**, **Damage Mechanisms**, **Mechanical & Metallurgical** Failure Mechanisms, Atmospheric & Low-Pressure **Storage Tank Inspection**, **Welding Inspection** & **Metallurgy** Pressure Design Thickness Calculation, **Metallurgy**, **Corrosion**, **Mechanical Integrity** Assessment, **Vibration Analysis**, **Pressure** & **Hydrostatic Leak** Testing, **Pneumatic Leak** Testing & Calculations, Preheating & Heat Treatment Requirements, **Pressure Piping** Design, **Pressure Piping** Inspection Practices, **Piping** Inspection, **Repair** & **Re-rating**, **Corrosion** & **Remaining Life** Calculation, **Fabrication** & Inspection, Conventional & Advanced Non-destructive Testing (**NDT**), Positive Material Identification (**PMI**), **Pressure-Relieving Devices** and Construction, Installation Fabrication, Erection, Inspection, Maintenance, Operation, Rating, Repair, Alteration, Reconstruction, Pigging, Integrity Assessment, Flaw Evaluation and Fitness-for-Service (**FFS**) of **Piping**. He is currently the **Plant API Inspector** wherein he is responsible for the statutory inspection of process plant and all pressurized equipment on the new three-train natural gas facility.

During his career life, Mr. Murphy has gained his practical and field experience through his various significant positions and dedication as the **Senior Project Quality Control Manager**, **Acting QA Manager**, **Site EPC Quality Manager**, **Asset Integrity Management Specialist**, **Quality Specialist**, **Asset Integrity Engineer**, **Quality Engineer**, **Senior Piping Inspector**, **Lead Corrosion Inspector**, **Statutory Inspector** (**TPI**), **Senior NDE Technician**, **Mechanical Surveyor**, **Quality Coordinator** and **Project Management Team Quality Control Representative** for various international companies like the Chuandongbei Gas Project, PT Donggi-Senoro LNG, Oceaneering – CABGOC (**Chevron**), **Fluor** Mid-East Ltd, **Fluor** Arabia Ltd, **ENGEN** Petroleum Refinery Ltd, Inspection Services – **Sasol** II, Badger Africa, Gasal Management Systems (Pty) Ltd. and PETROSA.

Mr. Murphy has a **Bachelor** degree in **Engineering** and **Foundation** degree in **Materials Fabrication & Engineering** from the **Open University**, **UK**. Further, he holds a **Diploma** in **Welding Technology** from the **TWI Cambridge**, **UK** and a **Certified Quality Assurance & Quality Control** from the **City & Guilds**, **UK**. Moreover, he is a **Certified Instructor/Trainer**, a Certified Pressure Vessels Inspector (**API 510**), a Certified Piping Inspector (**API 570**), a Certified Corrosion & Material Specialist (**API 571**), a Certified Risk Based Inspector (**API 580**), a Certified Above Ground Storage Tank Inspector (**API 653**), a **NACE – CIP Coating Inspector Level 1** from the National Association of Corrosion Engineers (**NACE-USA**), a **Certified SAIW Level II Welding/Fabrication Inspector**, a **Certified CSWIP 3.2 Senior Welding Inspector**, a **Certified SAIW-SAQCC IPE** (**Inspector of Pressurized Equipment**) and a **SAIW Certified Level II** in Magnetic Particle Testing (**MT**), Liquid Penetrant Testing (**PT**), Ultrasonic Testing (**UT**) and Radiographic Testing (**RT**). He is a **Registered Incorporated Engineer** by the Engineering Council (The Welding Institute) and has further delivered numerous courses, workshops, trainings, seminars and conferences worldwide.

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

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

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*** *Overview of Available RBI Software • Criteria for Selecting RBI Software*
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 Two*

Day 3

0730 – 0830	***Review of Day 2***
0830 – 0930	***Developing an RBI Program*** *Steps to Implement an RBI Program • Integration with Existing Asset Management Systems*
0930 – 0945	*Break*
0945 – 1100	***RBI Program Maintenance*** *Review & Update of RBI Assessments • Managing Changes in Process Conditions or Equipment*
1100 – 1200	***Case Studies: Implementing RBI*** *Examples of Successful RBI Implementation • Lessons Learned & Best Practices*
1200 – 1300	*Lunch*
1300 – 1430	***Risk Communication & Reporting*** *Communicating Risk to Stakeholders • Reporting Requirements & Formats*
1430 – 1530	***Performance Measurement & Improvement*** *Key Performance Indicators (KPIs) for RBI Programs • Continuous Improvement in RBI Processes*
1530 – 1545	*Break*
1545 – 1645	***RBI Program Audit & Review*** *Audit Objectives & Methodologies • Addressing Findings & Implementing Corrective Actions*
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 Three*

Day 4

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

1430 – 1530	***Human Factors & Organizational Impact on RBI*** *Role of Human Factors in Risk Assessment • Organizational Culture & its Impact on RBI Effectiveness*
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

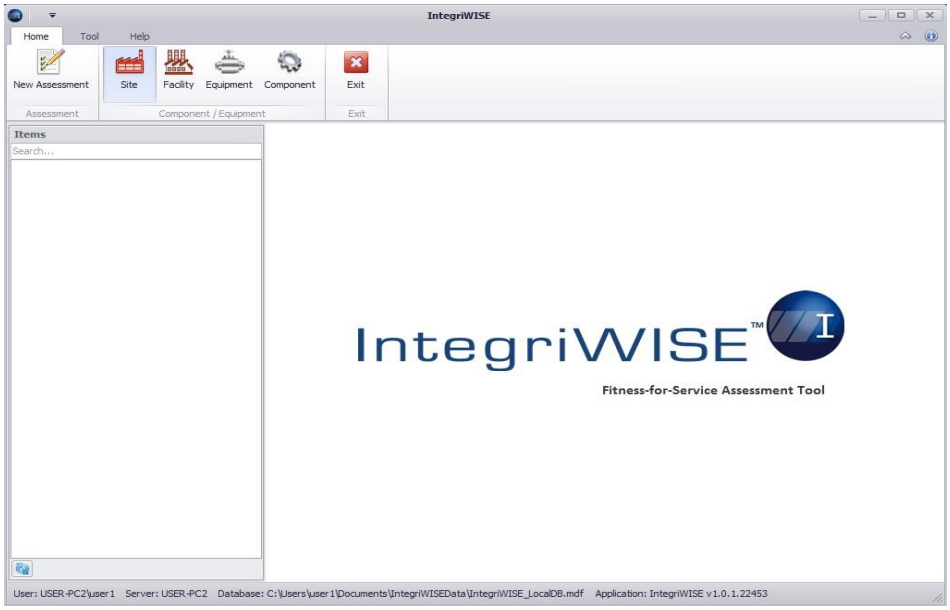
0730 – 0830	***Review of Day 4***
0830 – 0930	***Review & Exam Preparation*** *Review of API 580 & 581 Key Concepts • Critical Elements of API 580 & 581 • Recap of Main Topics & Principles*
0930 – 0945	*Break*
0945 – 1100	***Sample Exam Questions & Discussion*** *Reviewing Sample Questions • Discussion 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*

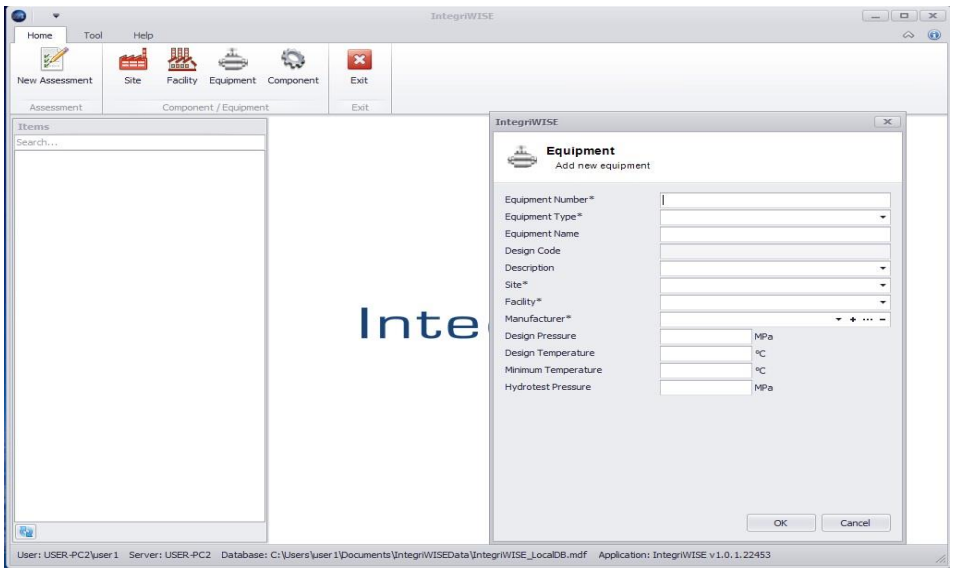
MOCK Exam

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 7 days following the course completion. Each participant has only one trial for the MOCK exam within this 7-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.

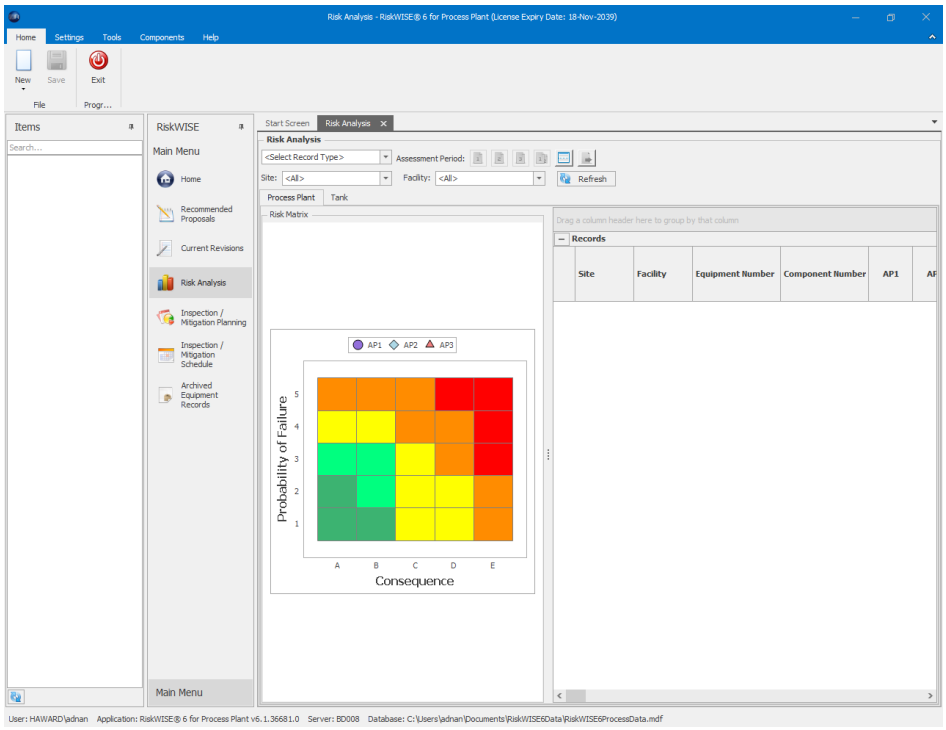
Simulator (Hands-on Practical Sessions)

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 "IntegriWISETM" and "RiskWISE".





IntegriWISE™



RiskWISE

Course Coordinator

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