



**COURSE OVERVIEW FE0580**

**API-579/580/581: Risk-Based-Inspection (RBI), Fitness-for-Service (FFS) and Repair Practices of Pipelines, Piping, Vessels & Tanks in Refineries, Gas, Oil & Petrochemical Facilities**

**Course Title**

API-579/580/581: Risk-Based-Inspection (RBI), Fitness-for-Service (FFS) & Repair Practices of Pipelines, Piping, Vessels & Tanks in Refineries, Gas, Oil & Petrochemical Facilities

**Course Reference**

FE0580

**Course Duration/Credits**

Five days/3.0 CEUs/30 PDHs

**Course Date/Venue**

Session(s)	Date	Venue
1	February 02-06, 2025	Boardroom, Warwick Hotel Doha, Doha, Qatar
2	April 06-10, 2025	Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE
3	June 23-27, 2025	Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
4	September 14-18, 2025	Al Aziziya Hall, The Proud Hotel Al Khobar, Al Khobar, KSA



**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.***



This course presents a comprehensive and practical introduction and application of the latest techniques in Risk-Based Inspection (RBI) planning, and Fitness-For-Service (FFS) analysis of inspection results. It discusses practical techniques for the analysis of equipment, piping and pipelines defects and degradation. The focus of the course is on predicting degradation in service, setting optimum inspection intervals (API 580-581), projecting remaining life based on generic data corrected for plant specific conditions, and applying quantitative analysis for degraded conditions to determine whether equipment is fit for continued service or should be repaired or replaced (API 579-1/ASME FFS-1, ASME B31G, etc.).



The course includes a discussion on identification of API RP 571 damage mechanisms, risk management, and risk mitigation strategies. Requirements for input data and information, and the roles of the RBI Assessment Team will be described. Approaches to levels of RBI assessment and basis for implementation will be examined.





The exercise will give Delegates the opportunity to key elements for implementation of an RBI system to a process facility. The course presenters are independent of any commercial organization and the Course Notes are applicable to all commercially available systems.

**Course Objectives**

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

- Apply systematic techniques in Risk-Based-Inspection (RBI) and Fitness-For-Services (FFS) and identify the various repair practices of pipelines, piping, vessels and tanks in refineries, gas, oil and petrochemical plants
- Practice the analysis of defects and degradation of equipment, piping and pipelines
- Predict degradation in service and set optimum inspection intervals (API-580/581)
- Estimate the remaining life based on generic data corrected for plant specific conditions
- Employ quantitative analysis for degraded conditions to determine whether equipment is fit for continued service or should be repaired or replaced (API 579-1/ASME FFS-1, ASME B31G)

**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 provides a wide understanding and deeper appreciation of risk based inspection, fitness-for-service and repair practices of pipelines, piping, vessels and tanks in refineries, gas, oil and petrochemical facilities in accordance with the international standards. Standard engineers, process, plant, maintenance, inspection and pipeline/piping engineers and inspectors who are responsible for the initial and continued integrity and cost-effective operation of equipment, piping systems and pipelines. Further, this course will interest all younger/graduate inspection engineers, mechanical engineers, graduate corrosion engineers, maintenance personnel and asset managers who are considering or implementing risk based inspection systems.

**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 Certificate(s)**

Internationally recognized certificates will be issued to all participants of the course who completed a minimum of 80% of the total tuition hours.

**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 **3.0 CEUs** (Continuing Education Units) or **30 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.

**Accommodation**

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







### 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 Magalios**, CEng, PGDip (on-going), MSc, BSc, is a **Senior Mechanical & Maintenance Engineer** with almost **40 years** of extensive **On-shore/Offshore** experience in the **Oil & Gas, Construction, Refinery** and **Petrochemical** industries. His expertise widely covers in the areas of **Preventive & Predictive Maintenance, Reliability Centered Maintenance, Applied Maintenance Management, Reliability Modelling, Reliability Techniques, Reliability Design Techniques, Advanced Root Causes Analysis & Techniques, Reliability Management, Pipeline Hot Tapping, Hot Tapping**

**Equipment, Hot Tapping Operation, Boiler Inspection & Maintenance, Boiler Systems, Boiler instrumentation & Controls, Boiler Start-up & Shutdown, Boiler Operation & Steam System Management, Pipe Cuttings, Flange Bolt Tightening Sequence, Hydro Testing, Pump Technology, Fundamentals of Pumps, Pump Selection & Installation, Centrifugal Pumps & Troubleshooting, Reciprocating & Centrifugal Compressors, Screw Compressor, Compressor Control & Protection, Gas & Steam Turbines, Turbine Operations, Gas Turbine Technology, Valves, Process Control Valves, API 598: Valve Inspection and Testing, Bearings & Lubrication, Advanced Machinery Dynamics, Rubber Compounding, Elastomers, Thermoplastic, Industrial Rubber Products, Rubber Manufacturing Systems, Heat Transfer, Vulcanization Methods, Welding Engineering, Fabrication & Inspection, Welding Techniques, Practical Welding Technology, Welding Inspection, Welding & Machine Shop, Welding & Machining, Welding Types & Applications, Welding Safety, Welding Defects Analysis, TIG & Arc Welding, Shielded Metal Arc Welding, Gas Tungsten & Gas Metal Arc Welding, Welding Procedure Specifications & Qualifications (WPS & WPQ), Aluminium Welding, Safe Welding, International Welding Codes, Welding Procedure Specifications, Welding & Brazing, Welder Performance Qualification, Pipeline Operation & Maintenance, Pipeline Systems, Pipeline Design & Construction, Pipeline Repair Methods, Pipeline Engineering, Pipeline Integrity Management System (PIMS). Currently, he is the **Chartered Professional Surveyor Engineer & Urban-Regional Planner** wherein he is deeply involved in providing exact data, measurements and determining properly boundaries. He is also responsible in preparing and maintaining sketches, maps, reports and legal description of surveys.**

During his career, Mr. Magalios has gained his expertise and thorough practical experience through challenging positions such as a **Project Site Construction Manager, Supervision Head/Construction Manager, Construction Site Manager, Project Manager, Deputy PMS Manager, Head of the Public Project Inspection Field Team, Technical Consultant, Senior Consultant, Consultant/Lecturer, Construction Team Leader, Lead Pipeline Engineer, Project Construction Lead Supervising Engineer, Lead Site Engineer, Senior Site Engineer Lead Engineer, Senior Site Engineer, Mechanical Engineer, R.O.W. Coordinator, Site Representative, Supervision Head, Contractor, Client Site Representative** and Acting Client Site Representative for international Companies such as the Public Gas Corporation, Penspen International Limited, Eptista Servicios de Ingenieria S.I., J/V ILF Pantec TH. Papaioannou & Co. – Emenergy Engineering, J/V Karaylannis S.A. – Intracom Constructions S.A., Ergaz Ltd., Alkyonis 7, Palaeo Faliro, Piraeus, Elpet Valkaniki S.A., Asprofos S.A., J/V Depa S.A. just to name a few.

Mr. Magalios is a **Registered Chartered Engineer** and has **Master and Bachelor** degrees in **Surveying Engineering** from the **University of New Brunswick, Canada** and the **National Technical University of Athens, Greece**, respectively. Further, he is currently enrolled for **Post-graduate** in **Quality Assurance** from the **Hellenic Open University, Greece**. He has further obtained a **Level 4B Certificates** in **Project Management** from the **National & Kapodistrian University of Athens, Greece** and **Environmental Auditing** from the **Environmental Auditors Registration Association (EARA)**. Moreover, he is a **Certified Instructor/Trainer**, a **Chartered Engineer** of **Technical Chamber of Greece** and has delivered numerous trainings, workshops, seminars, courses and conferences internationally.





**Course Fee**

Doha	<b>US\$ 6,000</b> per Delegate. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Dubai	<b>US\$ 5,500</b> per Delegate + <b>VAT</b> . This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Abu Dhabi	<b>US\$ 5,500</b> per Delegate + <b>VAT</b> . This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Al Khobar	<b>US\$ 5,500</b> per Delegate + <b>VAT</b> . This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

**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	<i>Registration &amp; Coffee</i>
0800 – 0815	<i>Welcome &amp; Introduction</i>
0815 – 0830	<b>PRE-TEST</b>
0830 – 0915	<i>Overview of Codes &amp; Standards API &amp; ASME</i>
0915 – 1000	<i>Latest Developments in Integrity &amp; Fitness-For-Service</i>
1000 – 1015	<i>Break</i>
1015 – 1100	<i>Overview of Material Strength &amp; Toughness</i>
1100 – 1145	<i>Overview of Design Rules</i>
1145 – 1230	<i>Overview of Corrosion &amp; Degradation Mechanisms</i>
1230 – 1245	<i>Break</i>
1245 – 1330	<b>Corrosion</b>
1330 – 1420	<i>Design Margins &amp; Corrosion Allowance</i>
1420 – 1430	<b>Recap</b>
1430	<i>Lunch &amp; End of Day One</i>

**Day 2**

0730 – 0800	<i>Evaluation of Inspection Results</i>
0800 – 0830	<i>Flaw Assessment: A Practical Approach</i>
0830 – 0915	<i>Fitness-For-Service Overview API 579-1/ASME FFS-1</i>
0915 – 0945	<b>Brittle Fracture Analysis</b>
0945 – 1000	<i>Break</i>
1000 – 1045	<i>General Metal Loss Analysis</i>
1045 – 1130	<i>Analysis of Wall Thinning &amp; Remaining Life</i>
1130 – 1215	<i>Team Exercise: Wall Thinning Analysis</i>
1215 – 1230	<i>Break</i>
1230 – 1315	<i>Calculate Initial Strength of Component</i>
1315 – 1400	<i>Calculate Remaining Strength of Corroded Equipment or Pipeline</i>
1400 – 1420	<i>Predict Remaining Life &amp; Failure Mode</i>
1420 – 1430	<b>Recap</b>
1430	<i>Lunch &amp; End of Day Two</i>





**Day 3**

0730 – 0830	<b>Local Metal Loss Analysis</b>
0830 – 0930	<b>Pitting Corrosion Analysis</b>
0930 – 0945	Break
0945 – 1100	<b>Blisters &amp; Laminations Analysis</b>
1100 – 1215	<b>Team Exercise: Local Metal Loss Analysis</b>
1215 – 1230	Break
1230 – 1330	<b>Analyze Remaining Strength of Component with Local Corrosion</b>
1330 – 1420	<b>Compare ASME B31G &amp; API 579-1/ASME FFS-1 Results</b>
1420 – 1430	<b>Recap</b>
1430	Lunch & End of Day Three

**Day 4**

0730 – 0830	<b>Distortions, Dents &amp; Gouges Analysis</b>
0830 – 0930	<b>Introduction to Fracture Mechanics</b>
0930 – 0945	Break
0945 – 1215	<b>Crack Flaws Analysis &amp; Fracture Mechanics</b>
1215 – 1230	Break
1230 – 1330	<b>Fatigue Analysis &amp; Remaining Life</b>
1330 – 1420	<b>Introduction to Risk-Based-Inspection API 580-581</b>
1420 – 1430	<b>Recap</b>
1430	Lunch & End of Day Four

**Day 5**

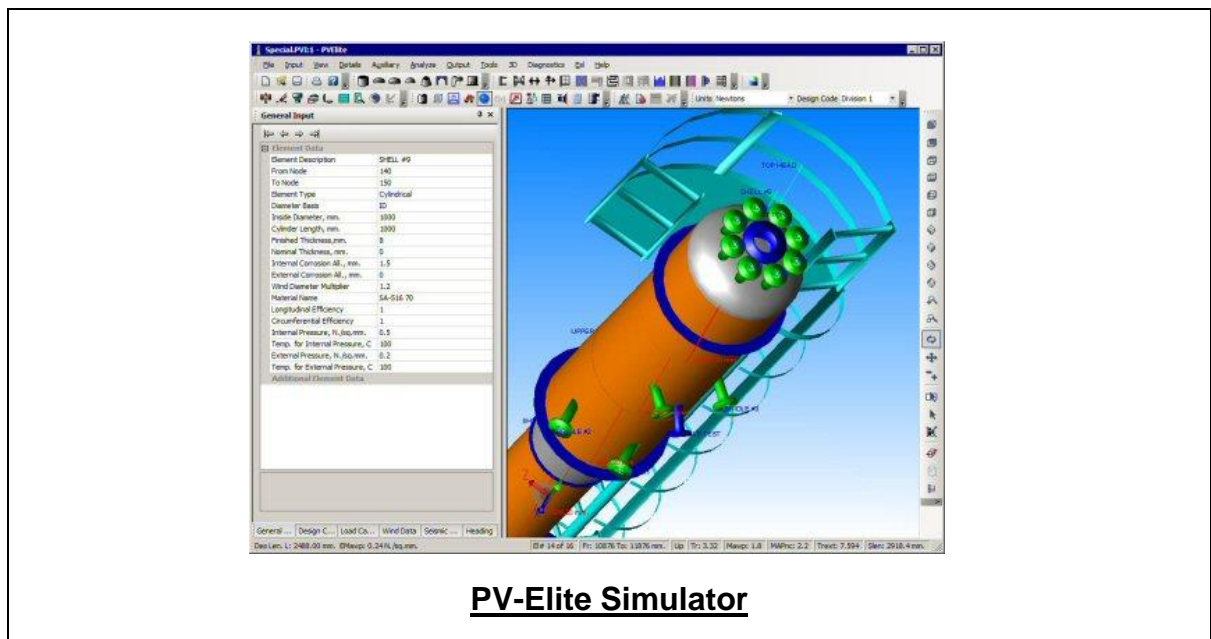
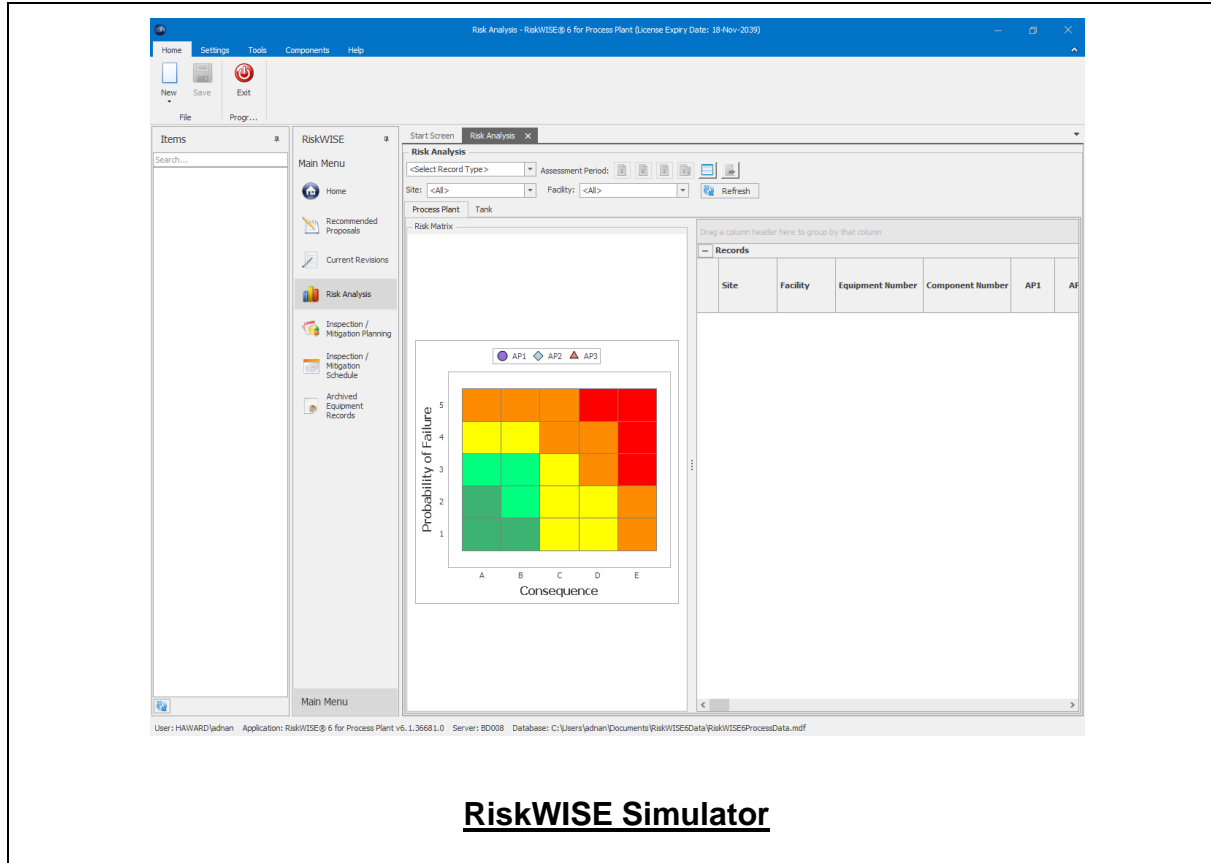
0730 – 0815	<b>API 581 Failure Likelihood Analysis</b>
0815 – 0845	<b>Corrosion Loops &amp; Failure Margins</b>
0845 – 0915	<b>API 581 Failure Consequence Analysis</b>
0915 – 0930	Break
0930 – 1015	<b>Preparation of Inspection Matrix</b>
1015 – 1130	<b>Examples of Plant RBIs</b>
1130 – 1215	<b>Team exercise: Risk-BASED Ranking</b>
1215 – 1230	Break
1230 – 1245	<b>Determine Corrosion Rate</b>
1245 – 1315	<b>Calculate Likelihood &amp; Consequence of Failure</b>
1315 – 1345	<b>Rank Systems &amp; Equipment for Inspection</b>
1345 – 1400	<b>Course Conclusion</b>
1400 – 1415	<b>POST-TEST</b>
1415 – 1430	<b>Presentation of Course Certificates</b>
1430	Lunch & End of Course





### Simulator (Hands-on Practical Sessions)

Practical session 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 simulators. "RiskWISE", "PV-Elite" and "IntegriWISE™".





The image displays two screenshots of the IntegriWISE software. The top screenshot shows the main application window with a menu bar (Home, Tool, Help) and a toolbar with icons for 'New Assessment', 'Site', 'Facility', 'Equipment', 'Component', and 'Exit'. Below the toolbar is a search bar labeled 'Items' and a large central area displaying the 'IntegriWISE™ Fitness-for-Service Assessment Tool' logo. The bottom status bar shows user and server information. The bottom screenshot shows the same main window but with an 'Equipment' dialog box open. The dialog box is titled 'Equipment' and 'Add new equipment'. It contains several input fields: 'Equipment Number\*', 'Equipment Type\*' (dropdown), 'Equipment Name', 'Design Code', 'Description', 'Site\*' (dropdown), 'Facility\*' (dropdown), 'Manufacturer\*' (dropdown), 'Design Pressure' (input) with a unit of 'MPa', 'Design Temperature' (input) with a unit of '°C', 'Minimum Temperature' (input) with a unit of '°C', and 'Hydrotest Pressure' (input) with a unit of 'MPa'. 'OK' and 'Cancel' buttons are at the bottom right of the dialog.

**IntegriWISE™**

**Course Coordinator**

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