COURSE OVERVIEW IE0181

Quality Management Assurance Techniques in (OT) Environments

Course Title

Quality Management Assurance Techniques in (OT) Environments

Course Reference

IE0181

3.0 CEUs (30 PDHs) AWARD

Course Duration/Credits

Five days/3.0 CEUs/30 PDHs

Course Date/Venue

Session(s)	Date	Venue
1	April 21-25, 2025	Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
2	August 10-14, 2025	Crowne Meeting Room, Crowne Plaza Al Khobar, Al Khobar, KSA
3	October 19-23, 2025	Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE
4	December 21-25, 2025	Meeting Plus 9, City Centre Rotana, Doha, Qatar

Course Description

This practical and highly-interactive course includes real-life case studies where participants will be engaged in a series of interactive small groups and class workshops.

This course is designed to provide participants with a detailed and up-to-date overview on the Quality Management Assurance Techniques in Operational Technology (OT) Environments. It covers the components of OT systems and critical importance of OT in industrial processes; the quality management and the regulatory standards for OT system; establishing quality objectives in OT by aligning objectives with business and operational strategies and incorporating stakeholder requirements; the risk assessment techniques and mitigation strategies; and incorporating risk management into quality plans.

Further, the course will also discuss the roles and responsibilities of quality managers and OT engineers; creating detailed process maps for quality assurance, identifying critical control points and maintaining accurate documentation; the proper testing and validation, calibration and accuracy assurance and defect management and resolution; conducting audits for compliance and improvement; reporting audit findings and recommendations; and verifying communication between subsystems and testing interoperability with legacy systems.

During this interactive course, participants will learn the statistical process control (SPC), Six Sigma, lean principles and automated quality monitoring systems; the change management, incident management, quality control and continuous improvement strategies; the cybersecurity threats in OT environments and quality assurance in secure systems; the resilience and recovery planning, compliance with cybersecurity standards and incident response and quality assurance; and the emerging trends in OT quality assurance, building a quality culture in OT and performance metrics for OT quality.

Course Objectives

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

- Apply and gain an in-depth knowledge on the quality management assurance techniques in operational technology (OT) environments
- Discuss the components of OT systems and critical importance of OT in industrial processes
- Carryout quality management and review regulatory standards for OT system
- Establish quality objectives in OT by aligning objectives with business and operational strategies and incorporate stakeholder requirements
- Identify risks, apply risk assessment techniques and mitigation strategies and incorporate risk management into quality plans
- Identify the roles and responsibilities of quality managers and OT engineers
- Create detailed process maps for quality assurance, identify critical control points and maintain accurate documentation
- Carryout testing and validation, calibration and accuracy assurance including defect management and resolution
- Conduct audits for compliance and improvement, report audit findings and implement recommendations
- Apply integration testing, verify communication between subsystems and test interoperability with legacy systems
- Recognize statistical process control (SPC), six sigma, lean principles and automated quality monitoring systems
- Employ change management, incident management, quality control and continuous improvement strategies
- Identify cybersecurity threats in OT environments and apply quality assurance in secure systems
- Carryout resilience and recovery planning, compliance with cybersecurity standards, and incident response and quality assurance
- Discuss the emerging trends in OT quality assurance, build a quality culture in OT and apply performance metrics for OT quality

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 an overview of all significant aspects and considerations of quality management assurance techniques in operational technology (OT) environments for OT engineers and technicians, process control engineers, cybersecurity professionals, operational technology managers, supply chain managers (in OT), quality assurance (QA) and quality control (QC) personnel, IT professionals working with OT systems, risk management and safety officers and other technical staff.

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: -

- 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.

- 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.

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. Barry Pretorius is a **Senior Instrumentation Engineer** with almost **30** years of extensive experience within the **Oil**, **Gas**, **Petrochemical**, **Refinery** & **Power** industries. His expertise widely covers in the areas of **Cyber Security** Practitioner, **Cyber Security** of Industrial Control System, **IT Cyber Security** Best Practices, **Cybersecurity** Fundamentals, **Ethical Hacking & Penetration Testing**, **Cybersecurity** Risk Management, **Cybersecurity** Threat Intelligence, **OT Whitelisting** for Better Industrial Control System Defense, **NESA** Standard and Compliance Workshop, **OT**, **Cyber Attacks** Awareness - Malware/Ransom Ware / Virus /Trojan/ Philsing, **Information Security Manager**, **Security System** Installation and Maintenance, Security of Distributed Control System (**DCS**), Process Control, Instrumentation, Safeguarding & Security, Programmable Logic Controller (**PLC**), **Siemens PLC** Simatic S7-400/S7-300/S7-200, **PLC & SCADA** for Automation & Process Control, **Artificial Intelligence**, **Allen Bradley PLC** Programing and Hardware Trouble Shooting, Schneider **SCADA System**, **Wonder Ware**, **Emerson**, **Honeywell**, **Honeywell** Safety Manager PLC, **Yokogawa**, Advanced **DCS Yokogawa**, **Endress & Hauser**, Field Commissioning and Start up Testing Pre Operations, System Factory Acceptance Test (**FAT**), System Site Acceptance Test (**SAT**), **SCADA HMI & PLC** Control Logic, Implementation, Systems Testing, Commissioning and Startup, **Foxboro DCS & Triconics, SIS** Systems, **Drives**, Motion Control, **Hydraulics**, **Pneumatics and Control Systems** Engineering, **Electrical & Automation Control Systems**, **HV/MV Switchgear, LV & MV** Switchgears & Circuit Breakers, **High Voltage Electrical Safety**, **LV & HV Electrical System**, **HV Equipment** Inspection & Maintenance, **LV Distribution Switchgear & Equipment**, **Electrical Safety**, **Electrical** Maintenance, **Transformers**, **Medium & High Voltage Equipment**, **Circuit Breakers**, **Cable & Overhead Line** Troubleshooting & Maintenance, **Electrical Drawing & Schematics**, **Voltage Distribution**, **Power Distribution**, **Filters**, **Automation System**, **Electrical Variable Speed Drives**, **Power** Systems, **Power Generation**, **Diesel Generators**, **Power Stations**, Uninterruptible Power Systems (**UPS**), **Battery Chargers**, **AC & DC Transmission**, **CCTV** Installation, **Data & Fire Alarm** System, **Evacuation** Systems and **Electrical Motors & Variable Speed Drives**, & Control of Electrical and Electronic devices.

During Mr. Pretorius's career life, he has gained his practical experience through several significant positions and dedication as the **Senior Technical Analyst, Team Leader, Pre-operations Startup Engineer, Automation System's Software Manager, Automation System's Senior Project Engineer, PLC Specialist, Site Manager, Senior Project & Commissioning Engineer, Technical Director, Project Engineer, Radio Technician**, **A T E Technician** and **Senior Instructor/Trainer** from various companies like the ADNOC Sour Gas, Ras Al Khair Aluminum Smelter, Johnson Matthey Pty. Ltd, Craigcor Engineering, Unitronics South Africa Pty (Ltd), Bridgestone/Firestone South Africa Pty (Ltd) and South African Defense Force.

Mr. Pretorius's has a Higher Diploma in **Electrical Engineering Heavy Current**. Further, he is a **Certified Instructor/Trainer** and delivered numerous trainings, courses, workshops, seminars and conferences internationally.

Course Fee

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

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.

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 OT Environments*** *Definition & Components of OT Systems • Differences Between IT & OT Systems • Critical Importance of OT in Industrial Processes • Challenges Specific to OT Environments*
0930 – 0945	*Break*
0945 - 1030	***Quality Management in OT*** *Definition & Objectives of Quality Management in OT • Role of Quality Assurance in OT System Reliability • Key Quality Principles (Consistency, Accuracy, Efficiency) • Stakeholders in OT Quality Management*

1030 - 1130	***Regulatory Standards for OT Systems*** *ISO 9001 & Its Relevance to OT • Industry-Specific Standards (IEC 62443, NERC CIP) • Compliance with Health, Safety, & Environmental Regulations • Impact of Non-Compliance on OT Operations*
1130 - 1230	***Establishing Quality Objectives in OT*** *Defining Measurable Quality Goals • Aligning Objectives with Business & Operational Strategies • Incorporating Stakeholder Requirements • Examples of OT-Specific Quality Objectives*
1230 - 1245	*Break*
1245 - 1330	***Risk Management in OT Quality Assurance*** *Identifying Risks in OT Systems • Risk Assessment Techniques (FMEA, HAZOP) • Mitigation Strategies for Common OT Risks • Incorporating Risk Management into Quality Plans*
1330 - 1420	***Roles & Responsibilities in OT Quality Management*** *Quality Managers versus OT Engineers • Collaboration Across Departments • Importance of Leadership in Quality Assurance • Training & Competency Development for OT Staff*
1420 - 1430	***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*
1430	*Lunch & End of Day One*

Day 2

0730 - 0830	***Process Mapping & Documentation*** *Understanding OT Workflows & Processes • Creating Detailed Process Maps for Quality Assurance • Identifying Critical Control Points in OT Processes • Best Practices for Maintaining Accurate Documentation*
0830 - 0930	***Testing & Validation in OT Environments*** *Importance of Rigorous Testing in OT • Functional Testing for OT Devices & Systems • Stress & Load Testing for System Reliability • Validation Techniques for Real-Time Systems*
0930 - 0945	*Break*
0945 - 1130	***Calibration & Accuracy Assurance*** *Importance of Calibration in OT Equipment • Methods for Calibrating Sensors & Actuators • Maintaining Accuracy in Data Acquisition Systems • Frequency & Record-Keeping for Calibration Activities*
1130 - 1230	***Defect Management & Resolution*** *Identifying & Classifying Defects in OT Systems • Root Cause Analysis for Recurring Defects • Tools for Defect Tracking & Reporting • Preventive Measures to Minimize Defects*
1230 - 1245	*Break*

1245 - 1330	***Quality Audits in OT*** *Types of Quality Audits: Internal versus External • Preparing for an OT Quality Audit • Conducting Audits for Compliance & Improvement • Reporting Audit Findings & Implementing Recommendations*
1330 - 1420	***OT System Integration Testing*** *Importance of Integration Testing in OT Environments • Verifying Communication Between Subsystems • Testing for Interoperability with Legacy Systems • Common Challenges in Integration Testing*
1420 - 1430	***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*
1430	*Lunch & End of Day Two*

Day 3

0730 - 0830	***Statistical Process Control (SPC)*** *Fundamentals of SPC in Quality Assurance • Monitoring Key Performance Indicators KPIs in OT • Interpreting Control Charts & Data Trends • Using SPC for Proactive Quality Management*
0830 - 0930	***Six Sigma & Lean Principles*** *Overview of Six Sigma Methodology • Applying DMAIC (Define, Measure, Analyze, Improve, Control) in OT • Lean Principles for Waste Reduction in OT Processes • Combining Lean & Six Sigma for Maximum Efficiency*
0930 - 0945	*Break*
0945 - 1130	***Automated Quality Monitoring Systems*** *Role of Automation in OT Quality Assurance • Examples of Automated Quality Control Systems • Integrating Monitoring Tools with OT Infrastructure • Benefits & Limitations of Automation*
1130 - 1230	***Change Management in OT Quality Assurance*** *Managing Changes in OT Systems & Processes • Risk Assessment for System Upgrades & Modifications • Ensuring Quality During Change Implementation • Documentation & Communication of Changes*
1230 - 1245	*Break*
1245 - 1330	***Incident Management & Quality Control*** *Detecting & Responding to Quality Incidents in OT •Incident Root Cause Analysis & Corrective Actions • Learning from Incidents to Improve Quality •Maintaining Records for Regulatory Compliance*
1330 - 1420	***Continuous Improvement Strategies*** *Importance of Kaizen in OT Environments • Identifying Opportunities for Incremental Improvements • Tools for Continuous Quality Improvement •Engaging Employees in Quality Initiative*
1420 - 1430	***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*
1430	*Lunch & End of Day Three*

Day 4

0730 - 0830	***Cybersecurity Threats in OT Environments*** *Common Cyber Threats to OT Systems • Differences Between IT & OT Cybersecurity Challenges • Impact of Cybersecurity on Quality Assurance • Real-World Examples of OT Cyber Incidents*
0830 - 0930	***Quality Assurance in Secure Systems*** *Integrating Cybersecurity with Quality Assurance Processes • Verifying the Security of OT Devices & Systems • Quality Checks for Secure Data Transmission • Importance of Access Control & Authentication*
0930 - 0945	*Break*
0945 - 1130	***Resilience & Recovery Planning*** *Ensuring System Resilience During Disruptions • Role of Redundancy in Maintaining Quality • Disaster Recovery Planning for OT Systems • Testing Recovery Plans for Effectiveness*
1130 - 1230	***Compliance with Cybersecurity Standards*** *Overview of IEC 62443 & Its Relevance to Quality • NERC CIP Standards for Critical Infrastructure • Ensuring Compliance with Cybersecurity Regulations • Role of Audits in Verifying Compliance*
1230 - 1245	*Break*
1245 - 1330	***Incident Response & Quality Assurance*** *Role of Quality Teams in Incident Response • Managing System Quality Post-Incident • Coordination Between Cybersecurity & Quality Teams • Learning from Incidents to Improve Security & Quality*
1330 - 1420	***Practical Exercises: Simulated OT Quality Scenarios*** *Identifying & Mitigating Quality Issues in a Simulated OT System • Developing a Response Plan for a Security-Related Quality Breach • Conducting a Mock Audit for OT Cybersecurity Compliance • Group Discussion & Feedback on Simulation Outcomes*
1420 - 1430	***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*
1430	*Lunch & End of Day Four*

Day 5

0730 - 0830	***Case Studies in OT Quality Management*** *Review of Successful OT Quality Assurance Projects • Lessons Learned from Quality Failures in OT • Industry-Specific Case Studies (Manufacturing, Energy, Utilities) • Applying Insights from Case Studies to Real-World Scenarios*
0830 - 0930	***Emerging Trends in OT Quality Assurance*** *Role of Artificial Intelligence & Machine Learning • Predictive Maintenance for Quality Assurance • Digital Twins & Their Application in OT Systems • Future Challenges & Opportunities in OT Quality Management*
0930 - 0945	*Break*
0945 - 1130	***Building a Quality Culture in OT*** *Importance of a Quality-First Mindset • Training Programs for OT Teams • Leadership's Role in Promoting Quality • Recognizing & Rewarding Quality Achievements*

1130 - 1230	***Performance Metrics for OT Quality*** *Key Metrics to Measure OT System Quality • Setting Benchmarks for Continuous Improvement • Analyzing & Reporting Quality Performance Data • Using Metrics to Guide Decision-Making*
1230 - 1245	*Break*
1245 - 1345	***Developing a Quality Assurance Plan*** *Participants Design a Quality Assurance Plan for an OT System • Identifying Key Processes, Risks, & Controls • Integrating Quality Metrics & Monitoring Tools • Presenting & Discussing the Plan with Peers & Instructors*
1345 - 1400	***Course Conclusion*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course*
1400 - 1415	***POST-TEST***
1415 - 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Practical Sessions

This practical and highly-interactive course includes the real-life case studies and exercises:-

Course Coordinator

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