COURSE OVERVIEW IE0343
Maintenance of Instrumented Protection Systems (IPS), Pneumatic Converters, Process Control Systems & Emergency Shutdown Valves

Course Title

Maintenance of Instrumented Protection Systems (IPS), Pneumatic Converters, Process Control Systems & Emergency Shutdown Valves

Course Date/Venue

September 15-19, 2024/TBA Meeting Room, The Tower Plaza Hotel, Dubai, UAE

Course Reference

IE0343

Course Duration/Credits

Five days/3.0 CEUs/30 PDHs

Course Objectives

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 is designed to provide participants with a detailed and up-to-date overview of Maintenance of Instrumented Protection Systems (IPS), Pneumatic Converters, Process Control Systems & Emergency Shutdown Valves. It covers the role and importance of instrumented protection systems in industrial safety; the principles and key components of operation and best practices for maintaining IPS effectively; the IPS troubleshooting common issues and problems; the relevant industry safety standards, compliance and regulations; the role of pneumatic converters in process control and instrumentation; and the installation and calibration of pneumatic converters.

Further, the course will also discuss the preventive maintenance techniques and strategies to prevent failures and ensure reliability; the diagnostic procedures and techniques for diagnosing issues in pneumatic converters; emerging new trends and technologies in pneumatic converters; and the fundamentals and importance of process control systems.

During this interactive course, participants will learn the techniques for configuring and optimizing process control systems; maintaining key components of sensor and transmitter; the control loops tuning and analysis and techniques for tuning control loops for optimal performance; the advanced troubleshooting strategies for diagnosing and resolving complex issues; the critical role of ESDVs in safety and process control; the guidelines for regular inspection and testing of ESDVs; the techniques for analyzing and learning from ESDV failures; the proven maintenance best practices and strategies for ESDVs; the valve actuators and positioners focusing on maintaining the vital components; the maintenance strategies combining maintenance practices for IPS, pneumatic converters, process control systems and ESDVs; advanced technologies in predictive maintenance; and the management of maintenance records and safety and risk management.

Course Objectives

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

- Apply and gain an in-depth knowledge on maintenance of instrumented protection systems (IPS), pneumatic converters, process control systems and emergency shutdown valves
- Discuss the role and importance of instrumented protection systems in industrial safety
- Explain the principles and key components of operation as well as demonstrate best practices for maintaining IPS effectively
- Identify and resolve frequent IPS troubleshooting common issues and problems
- Apply relevant industry safety standards, compliance and regulations
- Recognize the role of pneumatic converters in process control and instrumentation
- Install and calibrate pneumatic converters and apply preventive maintenance techniques and strategies to prevent failures and ensure reliability
- Implement diagnostic procedures and techniques for diagnosing issues in pneumatic converters as well as
- Emerge new trends and technologies in pneumatic converters as well as discuss the fundamentals and importance of process control systems
- Develop techniques for configuring and optimizing process control systems as well as maintain key components of sensor and transmitter
- Carryout control loops tuning and analysis through using techniques for tuning control loops for optimal performance
- Employ advanced troubleshooting strategies for diagnosing and resolving complex issues
- Explain the critical role of ESDVs in safety and process control as well as use the guidelines for regular inspection and testing of ESDVs
- Carryout systematic techniques for analyzing and learning from ESDV failures and proven maintenance best practices and strategies for ESDVs
- Identify valve actuators and positioners focusing on maintaining the vital components
- Integrate maintenance strategies combining maintenance practices for IPS, pneumatic converters, process control systems and ESDVs
- Explore advanced technologies in predictive maintenance as well as manage efficiently and utilize maintenance records and emphasize safety and risk in maintenance practices

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, sample video clips of the instructor's actual lectures & practical sessions during the course conveniently saved in a **Tablet PC**.*

Who Should Attend

This course provides an overview of all significant aspects and considerations of inspection, maintenance and calibration program of oil and gas flowmeters and petroleum custody instruments for instrumentation and control technicians/engineers, process engineers, safety engineers, maintenance engineers, plant operators, maintenance supervisors/managers, control system designers, safety officers and those who are involved in the maintenance, operation, and troubleshooting of industrial instrumentation and control 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 Fee

US$ 5,500 per Delegate + **VAT**. This rate includes Participants Pack (Folder, Manual, Hand-outs, etc.), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Accommodation

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

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:

- 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.

- 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. Ahmed Abozeid is a **Senior Electrical & Instrumentation Engineer** with over **30 years** of **Onshore** & **Offshore** experience within the **Oil** & **Gas** and **Power** industries. His wide expertise covers Instrumented Protection Systems (**IPS**), **Pneumatic Converters**, **Process Control Systems & Emergency Shutdown Valves**, **Smart Meters Communication** & **Troubleshooting**, **Fiber Optic Applications** in **Protective Relaying Systems**, **Networking Design** and **Configurations**, **Electrical Motors & Variable Speed Drives**, **Motor** Speed Control, Power Electronic Converters, AC Converters Section, Electromagnetic Compatibility (**EMC**), **Motor** Failure Analysis & Testing, **Machinery** Fault Diagnosis, **Bearing** Failure Analysis **Process Control & Instrumentation**, **Process Control Measurements**, **Control System Commissioning & Start-Up**, **Control System & Monitoring**, **Power Station Control System**, **Instrumentation Devices**, **Process Control & Automation**, **PID Controller**, Distributed Control Systems (**DCS**), Programmable Logic Controllers (**PLC**), **ABB PLC & DCS System**, **Gas Analyzers**, **Simulation Testing**, **Load Flow**, **Short Circuit**, **Smart Grid**, **Vibration Sensors**, **Cable Installation & Commissioning**, **Calibration Commissioning** and **Site Filter Controller**. Further, he is also well-versed in **Fundamentals of Electricity**, **Electrical Standards**, **Electrical Power**, **PLC**, **Electrical Wiring**, Machines, **Transformers**, **Motors**, **Power Stations**, **Electro-Mechanical Systems**, **Automation & Control Systems**, **Voltage Distribution**, **Power Distribution**, **Filters**, **Automation System**, **Electrical Variable Speed Drives**, **Power Systems**, **Power Generation**, **Power Transformers**, **Diesel Generators**, **Power Stations**, **Uninterruptible Power Systems** (**UPS**), **Battery Chargers** and **AC** & **DC Transmission**. He is currently the **Project Manager** wherein he manages, plans and implements projects across different lines of business.

Mr. Ahmed worked as the **Electrical Manager**, **Electrical Power & Machine Expert**, **Electrical Process Leader**, **Team Leader**, **Electrical Team Leader**, **Technical Instructor**, and **Instructor/Trainer** from various companies such as the Lafarge Nigeria, Egyptian Cement Company, ECC Training Center, Alrajhi Construction & Building Company and Ameria Cement Company, just to name a few.

Mr. Ahmed has a **Bachelor's** degree in **Electrical Engineering**. Further, he is a **Certified Instructor/Trainer** and has delivered numerous trainings, seminars, courses, workshops and conferences internationally.

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: ***Introduction to Instrumented Protection Systems (IPS)***

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Overview of Instrumented Protection Systems**: Their Role & Importance in Industrial Safety*
0930 – 0945	*Break*
0945 – 1030	***Principles of Operation**: How IPS Works & its Key Components*
1030 – 1130	***Routine Maintenance Practices**: Best Practices for Maintaining IPS Effectively*
1130 - 1230	***Troubleshooting Common Issues**: Identifying & Resolving Frequent IPS Problems*
1230 – 1245	*Break*
1245 – 1320	***Safety Standards & Compliance**: Relevant Industry Standards & Regulations*
1350 - 1420	***Case Studies**: Real-world Examples of IPS Maintenance Challenges & Solutions*
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2: ***Advanced Maintenance of Pneumatic Converters***

0730 – 0830	***Pneumatic Converters**: Their Role in Process Control & Instrumentation*
0830 – 0930	***Installation & Calibration**: Best Practices for Installing & Calibrating Pneumatic Converters*
0930 – 0945	*Break*
0945 – 1130	***Preventive Maintenance Techniques**: Strategies to Prevent Failures & Ensure Reliability*
1130 – 1230	***Diagnostic Procedures**: Techniques for Diagnosing Issues in Pneumatic Converters*
1230 – 1245	*Break*
1245 – 1345	***Hands-On Session**: Practical Exercises on Maintaining & Troubleshooting Pneumatic Converters*
1345 - 1420	***Emerging Technologies**: Introduction to New Trends & Technologies in Pneumatic Converters*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3: ***Process Control Systems***

0730 – 0830	***Fundamentals of Process Control Systems**: The Basics & their Importance*
0830 – 0930	***Configuration & Optimization**: Techniques for Configuring & Optimizing Process Control Systems*
0930 – 0945	*Break*
0945 – 1130	***Sensor & Transmitter Maintenance**: Best Practices for Maintaining Key Components*
1130 – 1230	***Control Loop Tuning & Analysis**: Techniques for Tuning Control Loops for Optimal Performance*

1230 – 1245	Break
1245 – 1345	***Advanced Troubleshooting**: Advanced Strategies for Diagnosing & Resolving Complex Issues*
1345 - 1420	***Interactive Workshop**: Group Activity Focused on Practical Problem-Solving in Process Control Systems*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4: Emergency Shutdown Valves (ESDVs) Maintenance

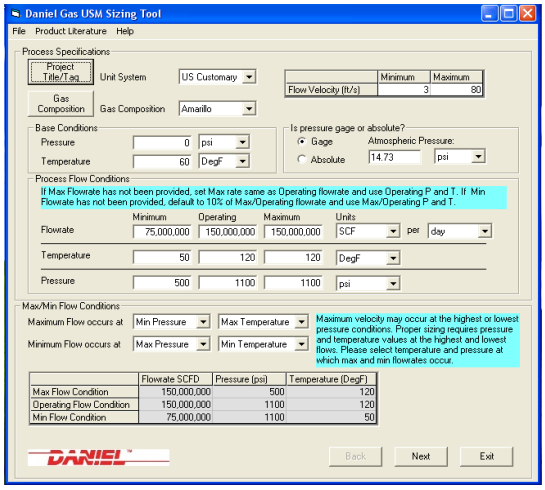
0730 – 0830	***Introduction to ESDVs**: Their Critical Role in Safety & Process Control*
0830 – 0930	***Routine Inspection & Testing**: Guidelines for Regular Inspection & Testing of ESDVs*
0930 – 0945	Break
0945 – 1130	***Failure Analysis**: Techniques for Analyzing & Learning from ESDV Failures*
1130 – 1230	***Maintenance Best Practices**: Proven Maintenance Strategies for ESDVs*
1230 – 1245	Break
1245 – 1345	***Valve Actuators & Positioners**: Maintaining these Vital Components*
1345 - 1420	***Simulation Exercises**: Practical Simulation of ESDV Maintenance Scenarios*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5: Integrative Practices and Advanced Topics

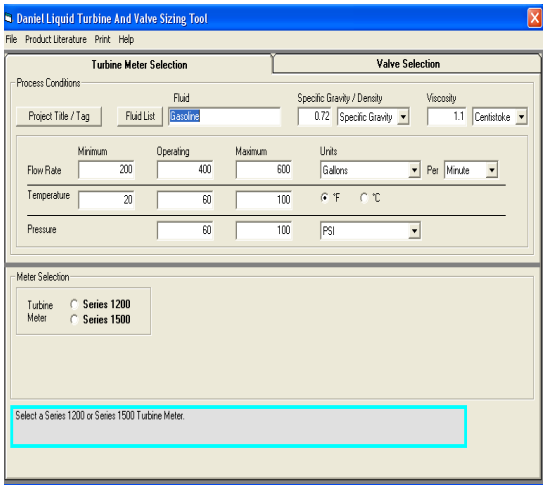
0700 – 0830	***Integrated Maintenance Strategies**: Combining Maintenance Practices for IPS, Pneumatic Converters, Process Control Systems & ESDVs*
0830 – 0930	***Predictive Maintenance Technologies**: Exploring Advanced Technologies in Predictive Maintenance*
0930 – 0945	Break
0945 – 1030	***Management of Maintenance Records**: Efficiently Managing & Utilizing Maintenance Data*
1030 – 1130	***Safety & Risk Management**: Emphasizing Safety in Maintenance Practices*
1130 - 1230	***Roundtable Discussion**: Sharing Experiences & Strategies Among Participants*
1230 – 1245	Break
1245 - 1345	***Evaluation & Feedback**: Assessing the Knowledge Gained & Providing Feedback for Continuous Improvement*
1345 – 1400	***Course Conclusion***
1400 – 1415	***POST TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Simulators (Hands-on Practical Sessions)

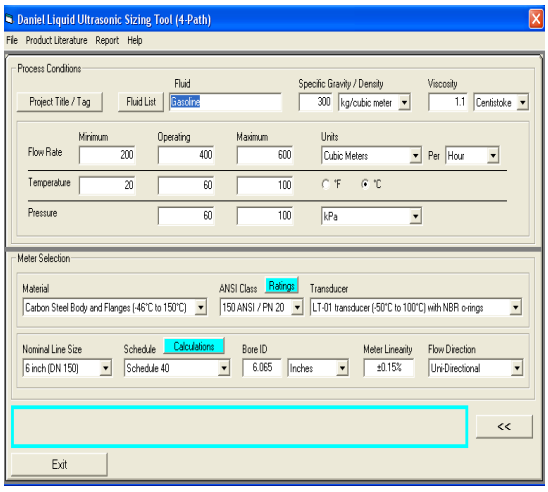
Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using our "Gas Ultrasonic Meter Sizing Tool", "Liquid Turbine Meter and Control Valve Sizing Tool", "Liquid Ultrasonic Meter Sizing Tool" and "Orifice Flow Calculator" simulators.



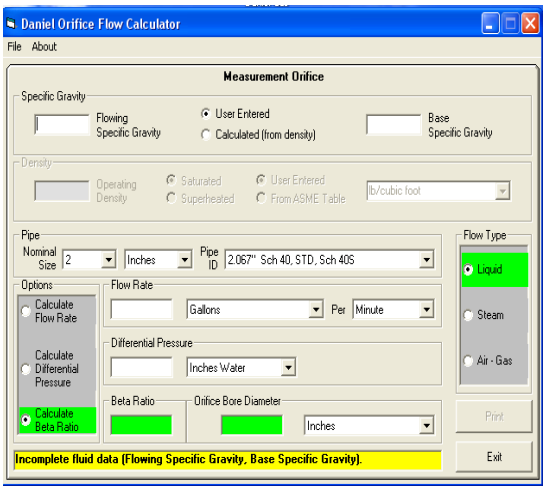
Gas Ultrasonic Meter (USM) Sizing Tool Simulator



Liquid Turbine Meter and Control Valve Sizing Tool Simulator



Liquid Ultrasonic Meter Sizing Tool Simulator



Orifice Flow Calculator Simulator

Course Coordinator

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