



COURSE OVERVIEW ME1152 **High Pressure Water Cleaning Techniques & Safety**

Course Title

High Pressure Water Cleaning Techniques & Safety

Course Date/Venue

August 24-28, 2025/Meeting Plus 9, City Centre Rotana, Doha, Qatar

Course Reference

ME1152



Course Duration/Credits

Five days/3.0 CEUs/30 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.

This course is designed to provide participants with a detailed and up-to-date knowledge of High-Pressure Water Cleaning Techniques and Safety. It covers the high-pressure water jetting, water jetting equipment, water jetting system components and high-pressure cleaning terminologies; the types of cleaning applications, standards and regulations, hazards of high-pressure water cleaning and PPE requirements and best practices; the job hazard analysis (JHA) and risk assessment; and the safe operating procedures (SOPs), lockout/tagout (LOTO), permit-to-work and emergency response procedures.



During the course, participants will be able to the system setup and operation, pump and nozzle maintenance, high-pressure hose handling and inspection and foot pedal and gun safety mechanisms; the tooling for specialty cleaning tasks and system troubleshooting and diagnostics; the surface cleaning techniques, heat exchanger and tube cleaning, tank and vessel internal cleaning and hydro-demolition techniques; the drain and sewer jetting, planning and execution of cleaning jobs; and the inspection and verification of cleaning and environmental considerations.



Course Objectives

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

- Apply and gain an in-depth knowledge on high pressure water cleaning techniques and safety
- Discuss high-pressure water jetting, water jetting equipment, water jetting system components and high-pressure cleaning terminologies
- Identify the types of cleaning applications, standards and regulations, hazards of high-pressure water cleaning and PPE requirements and best practices
- Explain job hazard analysis (JHA) and risk assessment, safe operating procedures (SOPs), lockout/tagout (LOTO) and permit-to-work and emergency response procedures
- Perform system setup and operation, pump and nozzle maintenance, high-pressure hose handling and inspection and foot pedal and gun safety mechanisms
- Identify tooling for specialty cleaning tasks and perform system troubleshooting and diagnostics
- Determine surface cleaning techniques, heat exchanger and tube cleaning, tank and vessel internal cleaning and hydro-demolition techniques
- Discuss drain and sewer jetting as well as planning and execution of cleaning jobs
- Carryout inspection and verification of cleaning and environmental considerations

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 high pressure water cleaning techniques and safety for maintenance technicians and engineers, industrial cleaners/operators, HSE (health, safety and environment) officers, plant supervisors and foremen, mechanical and process technicians, facility and utility engineers, contractors and service providers and those who involved in industrial cleaning, maintenance, and safety management.

Course Fee

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.

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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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.
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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.

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. Karl Thanasis, PEng, MSc, MBA, BSc, is **Senior Mechanical & Maintenance Engineer** with over **30 years** of extensive industrial experience. His wide expertise includes **Piping & Pipeline**, Maintenance, Repair, **Shutdown, Turnaround & Outages**, **Maintenance & Reliability Management**, **Mechanical Maintenance Planning, Scheduling & Work Control**, **Advanced Techniques in Maintenance Management**, **Predictive & Preventive Maintenance**, **Maintenance & Operation Cost Reduction Techniques**, **Reliability Centered Maintenance (RCM)**, **Machinery Failure Analysis**, **Rotating Equipment Reliability Optimization & Continuous Improvement**, **Material Cataloguing**, **Mechanical & Rotating Equipment Troubleshooting & Maintenance**, **Root Cause Analysis & Reliability Improvement**, **Condition Monitoring**, **Root Cause Failure Analysis (RCFA)**, **Steam Generation**, **Steam Turbines**, **Power Generator Plants**, **Gas Turbines**, **Combined Cycle Plants**, **Boilers**, **Process Fired Heaters**, Air Preheaters, Induced Draft Fans, All Heaters Piping Work, Refractory Casting, Heater Fabrication, Thermal & Fired Heater Design, **Heat Exchangers**, Heat Transfer, Coolers, **Power Plant Performance, Efficiency & Optimization**, **Storage Tank Design & Fabrication**, **Thermal Power Plant Management**, **Boiler & Steam System Management**, **Pump Operation & Maintenance**, **Chiller & Chiller Plant Design & Installation**, **Pressure Vessel**, **Safety Relief Valve Sizing & Selection**, **Valve Disassembling & Repair**, **Pressure Relief Devices (PSV)**, **Hydraulic & Pneumatic Maintenance**, **Advanced Valve Technology**, **Pressure Vessel Design & Fabrication**, **Pumps**, Turbo-Generator, Turbine **Shaft Alignment**, **Lubrication**, **Mechanical Seals**, **Packing**, **Blowers**, **Bearing Installation**, **Couplings**, **Clutches** and **Gears**. Further, he is also versed in **Wastewater Treatment Technology**, **Networking System**, **Water Network Design**, **Industrial Water Treatment** in Refineries & Petrochemical Plants, **Piping System**, **Water Movement**, **Water Filtering**, **Mud Pumping**, **Sludge Treatment and Drying**, **Aerobic Process of Water Treatment** that includes **Aeration**, **Sedimentation** and **Chlorination Tanks**. His strong background also includes **Design** and **Sizing** of all **Waste Water Treatment Plant Associated Equipment** such as **Sludge Pumps**, **Filters**, **Metering Pumps**, **Aerators** and **Sludge Decanters**.

Mr. Thanasis has acquired his thorough and practical experience as the **Project Manager**, **Plant Manager**, **Area Manager - Equipment Construction**, **Construction Superintendent**, **Project Engineer** and **Design Engineer**. His duties covered **Plant Preliminary Design**, **Plant Operation**, **Write-up of Capital Proposal**, **Investment Approval**, **Bid Evaluation**, **Technical Contract Write-up**, **Construction** and **Sub-contractor Follow up**, **Lab Analysis**, **Sludge Drying** and **Management of Sludge Odor and Removal**. He has worked in various companies worldwide in the **USA**, **Germany**, **England** and **Greece**.

Mr. Thanasis is a **Registered Professional Engineer** in the **USA** and **Greece** and has a **Master's** and **Bachelor's** degree in **Mechanical Engineering** with **Honours** from the **Purdue University** and **SIU** in **USA** respectively as well as an **MBA** from the **University of Phoenix** in **USA**. Further, he is a **Certified Internal Verifier/Trainer/Assessor** by the **Institute of Leadership & Management (ILM)** a **Certified Instructor/Trainer** and has delivered numerous trainings, courses, seminars, workshops and conferences worldwide.

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 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, 24th of August 2025

0730 – 0800	Registration & Coffee
0800 – 0815	Welcome & Introduction
0815 – 0830	PRE-TEST
0830 – 0930	Introduction to High-Pressure Water Jetting Overview and Definition of High-Pressure Cleaning • Categories: Low, High, Ultra-High Pressure Systems • Common Industrial Applications (Heat Exchangers, Tanks, Drains) • Benefits versus Traditional Cleaning Methods
0930 – 0945	Break
0945 – 1030	Understanding Water Jetting Equipment Types of Pumps: Direct Drive, Intensifier, and Crankshaft Pumps • Nozzles and Tips: Rotary, Fan, Pencil and Specialty Heads • Pressure Ratings and Flow Rate Specifications • Accessories: Guns, Lances, Hoses, Foot Pedals
1030 – 1130	Water Jetting System Components Water Supply System Requirements • Filtration and Booster Pumps • High-Pressure Hose Assemblies and Fittings • Pressure Regulators and Relief Valves
1130 – 1215	High-Pressure Cleaning Terminologies PSI, Bar, GPM, Nozzle Orifice Size • Standoff Distance and Impact Force • Swirl, Fan and Zero-Degree Jet Patterns • Water Horsepower and Cleaning Units
1215 – 1230	Break
1230 – 1330	Types of Cleaning Applications Surface Preparation and Descaling • Tube and Pipe Cleaning • Hydro-Demolition and Cutting • Vessel and Tank Internal Cleaning
1330 – 1420	Standards & Regulations WJTA (WaterJet Technology Association) Guidelines • ISO 20430: Safety for High-Pressure Water Jetting Machines • OSHA Standards and Local Regulatory Frameworks • Overview of Certification and Operator Training Levels
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: Monday, 25th of August 2025

0730 – 0830	Hazards of High-Pressure Water Cleaning <i>Penetrating Injuries and Fluid Injection • Hose Failures and Whip Hazards • Flying Debris and Splash-Back Injuries • Slips, Trips, Falls and Noise Hazards</i>
0830 – 0930	PPE Requirements & Best Practices <i>Head-to-Toe PPE (Helmets, Goggles, Gloves, Aprons) • Cut-Resistant Suits and Footwear Standards • Face Shields and Hearing Protection • Selection Based on Pressure and Task</i>
0930 – 0945	<i>Break</i>
0945 – 1100	Job Hazard Analysis (JHA) & Risk Assessment <i>Identifying Job-Specific Hazards • Assessing Severity and Probability • Defining Control Measures • Dynamic Risk Assessment Techniques</i>
1100 – 1215	Safe Operating Procedures (SOPs) <i>Pre-Start Checks and System Pressure Verification • Equipment Warm-Up and Shutdown Procedures • Operator Positioning and Line-of-Fire Awareness • Communication and Control Systems</i>
1215 – 1230	<i>Break</i>
1230 – 1330	Lockout/Tagout (LOTO) & Permit-to-Work <i>Isolation of Energy Sources • Authorized Access and Task Boundaries • Permits for Confined Space and Elevated Work • Tagging, Documentation and Approvals</i>
1330 – 1420	Emergency Response Procedures <i>First Aid for High-Pressure Injuries • Spill Response and Water Containment • Emergency Stop Procedures and Operator Signaling • Incident Reporting and Root Cause Analysis</i>
1420 – 1430	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>
1430	<i>Lunch & End of Day Two</i>

Day 3: Tuesday, 26th of August 2025

0730 – 0830	System Setup & Operation <i>Assembling Hoses, Fittings, and Lances • Water Source and Filtration Requirements • Pressure Adjustments and Nozzle Alignment • Calibration and Test Runs</i>
0830 – 0930	Pump & Nozzle Maintenance <i>Daily Inspection and Lubrication Practices • Checking Seals, Plungers, and Check Valves • Replacing Nozzles and Tips • Troubleshooting Common Issues</i>
0930 – 0945	<i>Break</i>
0945 – 1100	High-Pressure Hose Handling & Inspection <i>Hose Pressure Rating and Compatibility • Storage, Coiling, and Deployment Techniques • Visual Inspection for Wear and Tear • Testing and Tagging Schedules</i>
1100 – 1215	Foot Pedal & Gun Safety Mechanisms <i>Deadman Switch Function • Mechanical Integrity of Trigger Guns • Anti-Withdrawal Features • Maintenance and Inspection</i>
1215 – 1230	<i>Break</i>
1230 – 1330	Tooling for Specialty Cleaning Tasks <i>Pipe Cleaning Tools and Rotary Nozzles • Tank and Vessel Cleaning Heads • Robotic Crawlers and Semi-Automated Systems • Hydro-Demolition Accessories</i>



1330 – 1420	System Troubleshooting & Diagnostics <i>Identifying Loss of Pressure Causes • Recognizing Abnormal Pump Sounds or Vibrations • Detecting Nozzle Blockage or Cavitation • Using Gauges and Meters for Diagnostics</i>
1420 – 1430	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>
1430	<i>Lunch & End of Day Three</i>

Day 4: Wednesday, 27th of August 2025

0730 – 0830	Surface Cleaning Techniques <i>Scabbling and Surface Preparation • Coating and Rust Removal • Standoff Distance and Angle Selection • Avoiding Substrate Damage</i>
0830 – 0930	Heat Exchanger & Tube Cleaning <i>Straight and U-Tube Cleaning Procedures • Internal Rotary Nozzle Selection • Manual versus Automated Cleaning Options • Plugging, Fouling, and Blockage Removal</i>
0930 – 0945	<i>Break</i>
0945 – 1100	Tank & Vessel Internal Cleaning <i>Entry Restrictions and Confined Space Safety • Multi-Nozzle Rotating Heads and Access Ports • Internal Scaling and Sludge Removal • Containment and Water Drainage</i>
1100 – 1215	Hydro-Demolition Techniques <i>Controlled Concrete Removal Using Water Jets • Selecting Pressure and Flow for Depth Control • Reinforcement Bar Exposure and Preservation • Robotic versus Handheld Demolition</i>
1215 – 1230	<i>Break</i>
1230 – 1330	Drain & Sewer Jetting <i>Root Cutting, Desilting, and Debris Flushing • Use of Chain Flails and Rotary Cutters • Camera-Assisted Cleaning Systems • Pressure Balancing to Avoid Pipe Damage</i>
1330 – 1420	Case Studies & Best Practices <i>Industry Examples (Refinery, Power Plant, Food Processing) • Common Pitfalls in Jetting Operations • Benchmarking Performance and Efficiency • Operator Feedback and Improvement</i>
1420 – 1430	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>
1430	<i>Lunch & End of Day Four</i>

Day 5: Thursday, 28th of August 2025

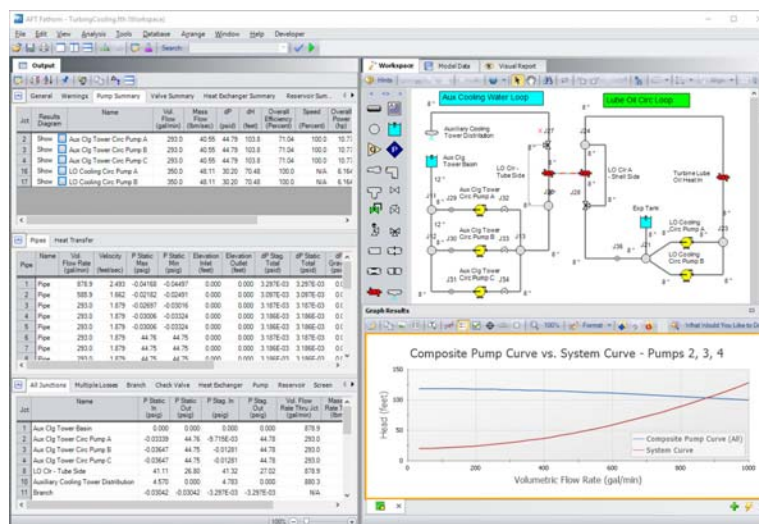
0730 – 0830	Planning & Execution of Cleaning Jobs <i>Scoping and Pre-Job Briefing • Equipment and Manpower Planning • Schedule Coordination with Other Workgroups • Weather and Environmental Considerations</i>
0830 – 0930	Documentation & Reporting <i>Cleaning Job Reports and Equipment Logs • Daily Inspection Checklists • Near-Miss and Incident Documentation • Quality Assurance Records</i>
0930 – 0945	<i>Break</i>



0945 – 1030	Inspection & Verification of Cleaning Post-Cleaning Inspection Techniques • Visual and Remote Verification Tools • Use of Borescopes and Cameras • Acceptable Cleanliness Levels
1030 – 1230	Environmental Considerations Water Runoff Management • Filtration and Containment Systems • Chemical Usage and Discharge Controls • Environmental Risk Assessments
1230 – 1245	Break
1245 – 1345	Training, Certification & Competency WJTA-IMCA and National Competency Levels • Operator Certification Levels (Basic to Advanced) • Refresher and Re-Certification Cycles • Third-Party versus Internal Certification Programs
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

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 “AFT Fathom 10 Fluid Dynamic Simulation Software”.



AFT Fathom 10 Fluid Dynamic Simulation Software

Course Coordinator

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