

# COURSE OVERVIEW HE0932 NFPA 20

Course Title NFPA 20

# Course Date/Venue

December 14-18, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE

O CEU

Course Reference HE0932

<u>Course Duration/Credits</u> Five days/3.0 CEUs/30 PDHs

# **Course Description**









This practical and highly-interactive course includes practical sessions and demonstration where participants carryout firefighting. Theory learnt in the class will be applied using a fire extinguisher through hands-on practical sessions.

This course is designed to provide participants with a detailed and up-to-date overview of NFPA 20. It covers the fundamentals of fire protection systems and fire pump applications and types; the basic hydraulic principles for fire pumps including the codes and standards interrelation with NFPA 20; the design considerations for fire pump systems, fire pump assembly and major components and fire pump driver types and selection; and the fire pump controllers and operation and suction and discharge piping requirements.

Further, the course will also discuss the jockey pumps and pressure maintenance; the fire pump room and environmental considerations; the fire pump system layout and configuration and fire pump performance requirements; the fire pump testing and commissioning and emergency power considerations; and backup the common installation deficiencies and best practices; the NFPA 25 inspection, testing, and maintenance requirements; and the (ITM) electrical and mechanical troubleshooting of fire pumps including vibration analysis and condition monitoring.



HE0932 - Page 1 of 9

HE0932-12-25|Rev.00|16 March 2025





During this interactive course, participants will learn the corrosion protection and material selection; the impact of water quality on fire pump performance; the coatings and treatments for fire pump components and saltwater and harsh environment challenges; the compliance audits, fire safety preparedness and integration of fire pumps with fire protection systems; the diesel fire pump fuel system requirements and energy efficiency and sustainability in fire pump systems; and the smart fire pumps and predictive maintenance, AI-based fire risk assessment and advanced testing techniques for fire pumps.

# **Course Objectives**

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

- Apply and gain a comprehensive knowledge on the installation of stationary pumps for fire protection in accordance with NFPA 20 standards
- Discuss the purpose and scope of NFPA 20, fundamentals of fire protection systems and fire pump applications and types
- Explain the basic hydraulic principles for fire pumps including the codes and standards interrelation with NFPA 20
- Review the design considerations for fire pump systems, fire pump assembly and major components and fire pump driver types and selection
- Apply fire pump controllers and operation and discuss suction and discharge piping requirements
- Carryout jockey pumps and pressure maintenance and interpret fire pump room and environmental considerations
- Illustrate fire pump system layout and configuration and recognize fire pump performance requirements
- Employ fire pump testing and commissioning and discuss emergency power and backup considerations
- Identify common installation deficiencies and best practices as well as NFPA 25 inspection, testing, and maintenance (ITM) requirements
- Carryout electrical and mechanical troubleshooting of fire pumps including vibration analysis and condition monitoring
- Apply corrosion protection and material selection and discuss the impact of water quality on fire pump performance
- Identify coatings and treatments for fire pump components and address saltwater and harsh environment challenges
- Carryout compliance audits, fire safety preparedness and integration of fire pumps with fire protection systems
- Recognize diesel fire pump fuel system requirements and energy efficiency and sustainability in fire pump systems
- Carryout smart fire pumps and predictive maintenance, AI-based fire risk assessment and advanced testing techniques for fire pumps



HE0932 - Page 2 of 9



HE0932-12-25|Rev.00|16 March 2025



# Exclusive Smart Training Kit - H-STK<sup>®</sup>



Participants of this course will receive the exclusive "Haward Smart Training Kit" (H-STK<sup>®</sup>). The H-STK<sup>®</sup> 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 on the installation of stationary pumps for fire protection in accordance with NFPA 20 standards for fire protection engineers, mechanical, electrical & plumbing (MEP) engineers, fire safety officers and inspectors, firefighters and emergency responders and other technical staff.

### Training Methodology

All our Courses are including Hands-on Practical Sessions using equipment, State-ofthe-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 Fee**

**US\$ 5,500** per Delegate + VAT. This rate includes H-STK<sup>®</sup> (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.



HE0932 - Page 3 of 9





# 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.

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.

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.



HE0932 - Page 4 of 9





# 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. Mahdi Hashim, NEBOSH, IOSH, OSHA, CIEH, HABC, is a Senior Fire & Safety Engineer with over 20 years of extensive experience within the Oil & Gas, Refinery and Petrochemical industries. He is a **NEBOSH Approved Instructor** for various certification programs. His expertise lies extensively in the areas of NEBOSH Certificate in Fire Safety, NEBOSH International Technical Certificate in Oil and Gas Operational Safety, NEBOSH International

General Certificate in Occupational Health & Safety, NEBOSH HSE Certificate in Process Safety Management, NEBOSH HSE Certificate in Health and Safety Leadership Excellence, NEBOSH Award in Health and Safety at Work, NEBOSH Environmental Awareness at Work Qualification, Process Safety Management, Health & Safety in the Workplace, IOSH Leading Safely, IOSH Managing Safely, Train-the-Trainer, Hazards & Risk Assessment, Control of Hazardous Substances, HAZOP Awareness, Advanced Hazard & Operability Study, Infection Prevention & Control, Hand & Power Tools Safety, Machine Guards Safety/Hand & Power Tools Safety, Safe Rigging & Lifting Tools, Lifting Equipment, Tools & Tackles, Safe Use of Tools & Equipment, Fire Fighting, Fire Fighter Rescue Missions, Fire Prevention & Safety, Applied Fire Risk Assessment, Active & Positive Fire Fighting, Fire & Gas Detection Systems, Fire Fighting & Rescue Operations, First Aid, Oil & Gas Firefighting Tactics, Advanced Storage Tank Fire, Fire Fighting Systems, Fire Proofing, Fire Truck Operation, Extinguishers & Hose Reels Operation, Approved Gas Tester, Gas Testing Equipment, Excavator and Fire & Security Management, Scaffolding Inspection & Fall Prevention, Safe Rigging & Lifting Tools, Advanced Rigging & Slinging, Crane/Hoist Operation, Confined Space Entry & Rescue, Safety Supervision & Leadership, Basic Safety in Power Industry, Safety Awareness, Risk Mitigation & Crisis Management, Occupational Safety & Health Management System, Environmental Management & Technology (EMT), Struggles Management Strategies & Skills, Dealing with Difficult People and Creativity & Innovation.

During his career life, Mr. Mahdi has gained his practical and field experience through his various significant positions and dedication as the HSE Senior Trainer, HSE Supervisor/Trainer, Fire Engineer, HSE Manager, Regional HSEQ Training Manager, HSE Officer, Fire Safety Inspector and Senior Instructor/Trainer from various international companies like the Algosaibi Vocational Training Center, TEEKAY, Ramsis Engineering, Hertel, TABET Enterprises Co. and GPZ Overseas Ltd. & Construction Co.

Mr. Mahdi is an Approved Tutor for NEBOSH International Technical Certificate in Oil and Gas Operational Safety, NEBOSH in Fire Safety, NEBOSH General Certificate in Occupational Health & Safety, NEBOSH Environmental Awareness at Work Qualification, NEBOSH HSE Certificate in Process Safety Management, NEBOSH HSE Certificate in Health & Safety Leadership Excellence, an Approved NEBOSH Practical Assessor and an Approved Tutor for HABC (Highfield Awarding Body for Compliance). Further, he is an OSHA Authorized Trainer, Professional & Specialist, a Certified Charter Trainer for CIEH (Chartered Institute of Environmental Health) and a Certified Trainer for IOSH Leading Safely, IOSH Managing Safely, Train-the-Trainer and Award in Health & Safety in the Workplace (Level 1-4). Moreover, he is an active technical member of IOSH & BHSS and delivered numerous trainings, courses, seminars, conferences and workshops internationally.



HE0932 - Page 5 of 9





<u>Course Program</u> 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, 14 <sup>th</sup> of December 2025
0730 - 0800	Registration & Coffee
0800 - 0815	Welcome & Introduction
0815 - 0830	PRE-TEST
0830 - 0930	<b>Overview of NFPA 20 &amp; Fire Protection Standards</b> Purpose & Scope of NFPA 20 • Relationship with Other NFPA Standards (NFPA 13, NFPA 25, NFPA 70, etc.) • Key Updates in the Latest Edition • Regulatory Compliance & Industry Adoption
0930 - 0945	Break
0945 - 1045	<b>Fundamentals of Fire Protection Systems</b> Fire Triangle & Fire Growth Principles • Role of Fire Pumps in Fire Protection • Fire Risk Assessment & Hazard Classification • Fire Suppression Systems Overview
1045 - 1145	<i>Fire Pump Applications &amp; Types</i> <i>Electric-Driven vs. Diesel-Driven Fire Pumps</i> • <i>Horizontal Split-Case vs.</i> <i>Vertical Inline/Vertical Turbine Pumps</i> • <i>Positive Displacement Fire Pumps</i> • <i>Selection Criteria for Different Applications</i>
1145 - 1230	<b>Basic Hydraulic Principles for Fire Pumps</b> Flow Rate & Pressure Requirements • Friction Losses in Piping Systems • Net Positive Suction Head (NPSH) Considerations • Hydraulic Calculations & Pump Curves
1230 - 1245	Break
1245 - 1330	<b>Codes &amp; Standards Interrelation with NFPA 20</b> NFPA 25 (Inspection, Testing, & Maintenance of Fire Pumps) • NFPA 13 (Sprinkler Systems & Water Supply Considerations) • NFPA 70 (Electrical Requirements for Fire Pumps) • UL/FM Listings & Approval Process
1330 - 1420	<b>Design Considerations for Fire Pump Systems</b> Water Supply Requirements (Static, Municipal, Storage Tanks) • Fire Flow Demand Calculations • Reliability & Redundancy in Fire Pump Systems • System Performance Requirements
1420 - 1430	<b>Recap</b> 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, 15 <sup>th</sup> of December 2025
0730 - 0830	Fire Pump Assembly & Major Components
	Pump Casing, Impeller, Shaft, & Bearings • Mechanical Seals & Packing •
	Pressure Gauges & Controllers • Coupling & Alignment Considerations
0830 - 0930	Fire Pump Driver Types & Selection
	Electric Motor Drivers: Types & Electrical Characteristics • Diesel Engine
	Drivers: Startup, Fuel Requirements, & Testing • Steam Turbine Drivers:
	Applications & Limitations • Standby Power & Generator Backup Requirements
0930 - 0945	Break



HE0932 - Page 6 of 9 HE0932-12-25|Rev.00|16 March 2025





0945 - 1130	Fire Pump Controllers & Operation
	Types of Controllers: Manual, Automatic, & Combination • NFPA 20
	Requirements for Controllers • Startup Sequence & Automatic Operation •
	Emergency Operation & Fail-Safe Features
1120 1220	Suction & Discharge Piping Requirements
	Suction Pipe Sizing & Layout Considerations • Discharge Pipe & Valving
1150 - 1250	Configurations • Pressure Relief & Circulation Relief Valves • Backflow
	Prevention & System Isolation
1230 - 1245	Break
1245 - 1330	Jockey Pumps & Pressure Maintenance
	Role of Jockey Pumps in Fire Pump Systems • Sizing & Capacity Selection •
	Automatic Pressure Regulation • Common Issues & Troubleshooting
	Fire Pump Room & Environmental Considerations
1220 1420	NFPA 20 Requirements for Fire Pump Rooms • Ventilation, Drainage, & Flood
1330 - 1420	Protection • Accessibility & Clearance Requirements • Seismic, Weather, &
	Hazard Considerations
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:	Tuesday, 16 <sup>th</sup> of December 2025
0730 - 0830	Fire Pump System Layout & Configuration
	Best Practices for Fire Pump Room Layout • NFPA 20 Clearance & Space
	Requirements • Multiple Pump Arrangements & Parallel Operation • Fire Pump
	House Design Considerations
	Fire Pump Performance Requirements
0020 0020	NFPA 20 Flow & Pressure Criteria • Pump Performance Curve Interpretation •
0850 - 0950	Variable Speed vs. Constant Speed Fire Pumps • Overspeed & Underspeed
	Conditions
0930 - 0945	Break
	Fire Pump Testing & Commissioning
0045 1120	NFPA 20 Requirements for Field Acceptance Tests • Hydrostatic Testing & Flow
0945 - 1150	Testing Procedures • Pitot Tube & Ultrasonic Flow Measurements • Fire Pump
	Churn, Rated, & Overload Testing
	Emergency Power & Backup Considerations
1130 - 1230	Standby Generator Requirements for Fire Pumps • NFPA 70 & NEC
	Requirements for Electrical Wiring • Transfer Switches & Power Supply
	Reliability • Load Shedding & Power Failure Scenarios
1230 - 1245	Break
	Common Installation Deficiencies & Best Practices
1245 - 1330	Improper Suction Piping & Cavitation Issues • Incorrect Controller Wiring &
	Electrical Faults • Failure to Meet NFPA 20 Performance Requirements • Proper
	Alignment, Vibration, & Noise Control



HE0932 - Page 7 of 9





1330 - 1420	<i>Case Studies on Fire Pump Failures &amp; Solutions</i> <i>Real-World Examples of Fire Pump System Failures</i> • <i>Lessons Learned from</i> <i>NFPA 20 Compliance Audits</i> • <i>Root Cause Analysis of Performance Issues</i> • <i>Best Practices for Long-Term Reliability</i>
1420 - 1430	<b>Recap</b> 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:	Wednesday, 17 <sup>th</sup> of December 2025
0730 - 0830	<b>NFPA 25</b> <i>Inspection, Testing, &amp; Maintenance (ITM) Requirements</i> Daily, Weekly, Monthly, & Annual Inspections • Required Testing Procedures for Fire Pumps • Preventive Maintenance vs. Corrective Maintenance • Documentation & Record-Keeping Best Practices
0830 - 0930	<i>Electrical &amp; Mechanical Troubleshooting of Fire Pumps</i> Diagnosing Low Pressure & Low Flow Conditions • Troubleshooting Electrical Control Panel Issues • Common Diesel Engine Fire Pump Failures • Cavitation & Air Entrainment Problems
0930 - 0945	Break
0945 - 1130	<i>Vibration Analysis &amp; Condition Monitoring</i> <i>Importance of Vibration Analysis in Fire Pumps</i> • <i>Detecting Bearing Failures &amp; Misalignment Issues</i> • <i>Thermographic &amp; Ultrasonic Inspection Techniques</i> • <i>Predictive Maintenance for Fire Pumps</i>
1130 - 1230	Corrosion & Environmental ChallengesCorrosion Protection & Material Selection • Impact of Water Quality on FirePump Performance • Coatings & Treatments for Fire Pump Components •Addressing Saltwater & Harsh Environment Challenges
1230 - 1245	Break
1245 - 1330	Software Tools for Fire Pump Monitoring & Diagnostics SCADA & Remote Monitoring Systems • Smart Fire Pump Controllers with IoT Integration • Digital Twin Technology for Predictive Analysis • Trend Analysis & Performance Benchmarking
1330 - 1420	<i>Compliance Audits &amp; Fire Safety Preparedness</i> NFPA & AHJ (Authority Having Jurisdiction) Inspections • Common Violations & Compliance Failures • Preparing for Third-Party Audits & Certifications • Fire Safety Drills & Emergency Response Planning
1420 - 1430	<b>Recap</b> 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:	Thursday, 18 <sup>th</sup> of December 2025
0720 0020	Integration of Fire Pumps with Fire Protection Systems
	Coordination with Sprinkler & Standpipe Systems • High-Rise Building Fire
0730 - 0930	Pump Challenges • Industrial Fire Pump Applications • Specialized Fire
	Protection Scenarios
0930 - 0945	Break
	Diesel Fire Pump Fuel System Requirements
0045 1100	NFPA 20 Fuel Tank Sizing & Capacity Requirements • Fuel Quality &
0945 - 1100	Contamination Issues • Maintenance & Inspection of Fuel Systems • Emergency
	Refueling & Backup Plans
** (ios	HE0932 - Page 8 of 9
BAC	HE0932-12-25/Rev.00/16 March 2025





1100 – 1200	Energy Efficiency & Sustainability in Fire Pump Systems
	Variable Frequency Drives (VFDs) in Fire Pumps • Energy-Efficient Fire Pump
	Design Considerations • Water Conservation & Recycling Systems • Green
	Building Compliance & Fire Protection
1200 - 1215	Break
1215 - 1300	Innovations in Fire Protection & Pump Technology
	Smart Fire Pumps & Predictive Maintenance • AI-Based Fire Risk Assessment •
	Advanced Testing Techniques for Fire Pumps • Future Trends in Fire Protection
	Engineering
	Course Conclusion
1300 - 1315	Using this Course Overview, the Instructor(s) will Brief Participants about the
	Course Topics that were Covered During the Course
1315 - 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 fire extinguishers.



# Course Coordinator

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HE0932 - Page 9 of 9

