

COURSE OVERVIEW PE0499
Fuel Oil & Bunker Fuel
(E-Learning Module)

Course Title

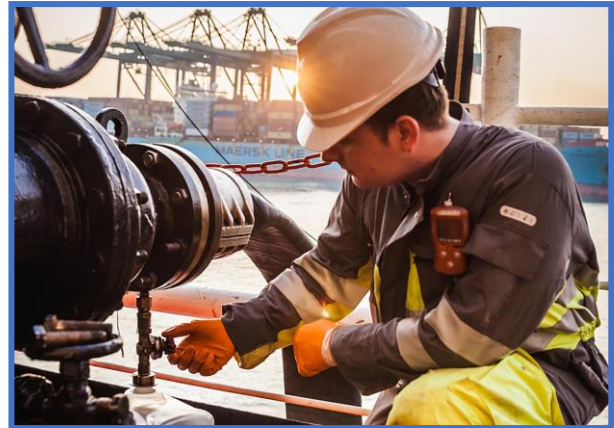
Fuel Oil & Bunker Fuel
 (E-Learning Module)

Course Reference

PE0499

Course Format & Compatibility

SCORM 1.2. Compatible with IE11, MS-Edge, Google Chrome, Windows, Linux, Unix, Android, IOS, iPadOS, macOS, iPhone, iPad & HarmonyOS (Huawei)



Course Duration

30 online contact hours
 (3.0 CEUs/30 PDHs)



Course Description



This is E-Learning is designed to provide participant with a detailed and up-to-date overview of fuel oil and bunker oil. It covers the fuel oil, maritime fuel classification, fuel oil viscosity, bunkering fuel and fuel oil transfer; the three (3) types of fuel; the shipping engine including its underlying principles and fuel requirements; the difference in a marine engine and recognize the 7 technologies to reduce fuel consumption of ships; and the fuel supply system emergency preparedness, industry best practice adopted in the supply and proper handling and usage of fuel.

Further, the course will also discuss the supply chain management, integrated fuel supplier network and diesel fuel system, storage and supply; the HSE requirement when dealing hydrocarbons; managing a fuel filling station; the main hazards involved when working with fuel; the diesel fuel system basics and the components of fuel system; the high pressure common rail fuel system diagram; the fuel injectors, diesel fuel, environmental considerations and biomass fuels; the 4 types of fossil fuels; the examples of real-life problems associated with the contamination of fuel and solutions to remedy them; and the air pollution, water pollution, soil pollution, soil contamination, soil remediation and bio-remediation thermal desorption.

During this interactive course, participants will learn some steps to reduce soil contamination/pollution; the two major operations of logistics; the bunker/fuel standards, bunker fuel quality, crude oil & refining, marine fuel production and fuel oil composition; the fuel oil contaminants by GC-MS, ASTM test method for contaminated bunkers 'limited' and quality issues; the fuel oil and bunker fuel quality assurance; and the quality issues, seized fuel pump.

Course Objectives

After completing the course, the employee will:-

- Apply and gain a comprehensive knowledge on fuel oil and bunker fuel
- Understand the shipping engine, its underlying principles and fuel requirements
- Understand the critical characteristics of fuel including additives
- Understand the industry best practice adopted in the supply, handling and use of fuel
- Understand real-life problems associated with the contamination of fuel and solutions to remedy them
- Understand the practical side of operations and logistics, bunker/fuel standards, traceability and quality assurance
- Discuss fuel oil, maritime fuel classification, fuel oil viscosity, bunkering fuel and fuel oil transfer
- Identify the three (3) types of fuel and explain the shipping engine including its underlying principles and fuel requirements
- Explain the difference in a marine engine and recognize the different types of fuel and the 7 technologies to reduce fuel consumption of ships
- Apply fuel supply system emergency preparedness, industry best practice adopted in the supply and proper handling and usage of fuel
- Carryout supply chain management, establish integrated fuel supplier network and recognize diesel fuel system, storage and supply
- Identify the HSE requirement when dealing hydrocarbons, manage a fuel filling station and discuss the main hazards involved when working with fuel
- Discuss diesel fuel system basics and the components of fuel system
- Illustrate high pressure common rail fuel system diagram and interpret fuel injectors, diesel fuel, environmental considerations and biomass fuels
- Identify the 4 types of fossil fuels and give examples of real-life problems associated with the contamination of fuel and solutions to remedy them
- Discuss air pollution, water pollution, soil pollution, soil contamination, soil remediation and bio-remediation thermal desorption
- Apply some steps to reduce soil contamination/pollution and identify the two major operations of logistics

- Discuss bunker/fuel standards, bunker fuel quality, crude oil & refining, marine fuel production and fuel oil composition
- Identify fuel oil contaminants by GC-MS, ASTM test method for contaminated bunkers 'limited' and quality issues
- Recognize fuel oil and bunker fuel quality assurance as well as quality issues, seized fuel pump

Who Should Attend

This course provides an overview for all significant aspects and considerations of fuel oil and bunker fuel for those involved in vessel chartering, operations, bunkering processes, fuel oil analysis and procurement or similar commercial roles.

Training Methodology

This Trainee-centered course includes the following training methodologies:-

- Talking presentation Slides (ppt with audio)
- Simulation & Animation
- Exercises
- Videos
- Case Studies
- Gamification (learning through games)
- Quizzes, Pre-test & Post-test

Every section/module of the course ends up with a Quiz which must be passed by the trainee in order to move to the next section/module. A Post-test at the end of the course must be passed in order to get the online accredited certificate.

Course Fee


As per proposal

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course.

Certificate Accreditations


Certificates are accredited by the following international accreditation organizations: -

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USA International Association for Continuing Education and Training (IACET)

Haward Technology is an Authorized Training Provider by the International Association 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 1-2013 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 1-2013 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 Association 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.

Course Contents

- Introduction to Fuel Oil & Bunker Fuel
- Fuel Oil
- Maritime Fuel Classification
- MGO (Marine Gas Oil)



- MDO (Marine Diesel Oil)
- IFO (Intermediate Fuel Oil)
- HFO (Heavy Fuel Oil)
- MFO (Marine Fuel Oil)
- Standards and Classification
- Fuel Oil Viscosity
- IFO 380
- IFO 180
- LS 380
- LS 180
- LSMGO
- ULSMGO
- Bunkering Fuel
- Fuel Oil Transfer
- What Is 180 CST Fuel Oil?
- Is Bunker Fuel the Same As Diesel?
- What Are The 3 Types of Fuel?
- Case Study (1)
- Illustrative Video (1)
- The Section Quiz
- The Shipping Engine, Its Underlying Principles and Fuel Requirements
- The Difference in a Marine Engine
- Why are Marine Engines so Expensive?
- Marine Engine
- How do Ships Get Fuel?
- Types of Fuel Used on Ships
- What are the Types of Bunker Fuel?
- Different Types of Fuel
- DMA Fuel
- How do the Ships Get Fuel?
- 7 Technologies to Reduce Fuel Consumption of Ships
- Case Study
- The Section Quiz



- What Fuel is Used in Ships?
- How do Ships Get Fuel?
- What is a Bunkering Vessel?
- Why is Ship Fuel Called Bunker?
- Fuel Supply Methodology
- Fuel Supply System Emergency Preparedness
- Fuel Shipping Emergency Preparedness for Natural Disasters
- Environmental Consideration
- Case Study
- Illustrative Video
- The Section Quiz
- Industry Best Practice Adopted in the Supply, Handling and Use of Fuel
- Best Practice
- Supply Chain Management
- Scale-Up Potential
- Supplier Development Model
- Establishing Integrated Fuel Supplier Network
- Diesel Fuel System
- Diesel Fuel Storage and Supply
- HSE Requirement When Dealing Hydrocarbons
- How Do You Manage a Fuel Filling Station?
- Is Petrol Covered by COSHH?
- Can a Petrol can Explode?
- Can I Mix Old Petrol with New?
- What are the Main Hazards Involved When Working with Fuel?
- Case Study
- Illustrative Video
- The Section Quiz
- Industry Best Practice Adopted in the Supply, Handling and Use of Fuel
- Diesel Fuel System Basics
- The Fuel System Consists of the Following Components
- Fuel Tanks
- Fuel Lines



- Fuel Filters
- Fuel Transfer Pumps
- Fuel Injection Systems
- High Pressure Common Rail Fuel System Diagram
- Fuel Injectors
- Diesel Fuel
- Water
- Conclusion
- Environmental Considerations
- What Fuel is Good for the Environment?
- Why is Fuel Bad for the Environment?
- What is the Greenest Fuel?
- What is the Most Sustainable Fuel?
- Biomass Fuels
- Air Pollution
- What are the 4 Types of Fossil Fuels?
- Petroleum
- Coal
- Natural Gas
- Orimulsion
- Case Study
- Illustrative Video
- The Section Quiz
- Real-Life Problems Associated with the Contamination of Fuel and Solutions to Remedy Them (Off-Shore)
- Real-Life Problems Associated with Fossil Fuel Use
- What Uses Does Coal Have Nowadays?
- What are the Problems with the Use of Coal?
- What Uses Does Oil Have?
- What are the Problems with the Use of Oil?
- Air Pollution
- Water Pollution
- Soil Pollution
- Why is the Use Of Natural Gas on the Rise?





- Is it Possible to Alleviate these Problems? How?
- What are the Obstacles for Tackling these Problems?
- Case Study
- Illustrative Video
- The Section Quiz
- Contamination of Fuel and Solutions to Remedy Them
- Soil Contamination
- Natural and Anthropogenic Activities
- Natural Activities
- Soil Contamination
- Soil Remediation
- Soil Remediation- Types of Techniques
- Bio-Remediation
- What is in Situ
- Thermal Desorption
- Encapsulation
- Soil Chemical Oxidation
- Stabilization
- Soil Washing
- Soil Disposal
- Some Steps to Reduce Soil Contamination/Pollution
- Case Study
- Illustrative Video
- The Section Quiz
- The Practical Side of Operations and Logistics of Fuel Supply
- What are Logistics Operations?
- How does Logistics Work Within the Supply Chain?
- How do Logistics Affect Supply?
- What are the Two Major Operations of Logistics?
- Is Supply Chain Same as Logistics?
- Three Types of Logistics
- What are Different Types of Logistics?
- 12 Logistical Elements



- Case Study
- Illustrative Video
- The Section Quiz
- The Practical Side of Operations and Logistics -Bunker/Fuel Standards, Traceability and Quality Assurance
- Bunker/Fuel Standards
- Bunker Fuel Quality
- The Fuel Supply Chain
- Crude Oil & Refining
- Marine Fuel Production: Complex Refinery Processes (Catalytic Cracking & Vis-Breaking)
- Fuel Oil Composition
- Aromatics
- Paraffins
- Fuel Stability & Compatibility
- Separability Number
- Enviro-Legislation & Blending Impact on Fuel Quality
- Global Fuel Quality
- Forensic Detection of Fuel Contaminants
- Potential Fuel Contaminants
- Fuel Specification – ISO 8217
- ISO-8217:2017 Edition
- What is or Rather isn't Happening?
- Identification of Fuel Oil Contaminants by GC-MS
- GCMS-HS Screening & Extended HS
- Five Flavors of GCMS Testing
- ASTM Test Method for Contaminated Bunkers 'Limited'
- Quality Issues
- VPS Issued a Number of Bunker Alerts
- Case Study
- Illustrative Video
- The Section Quiz
- Fuel Oil & Bunker Fuel Quality Assurance
- Quality Issues

- Other Quality Issues
- Seized Fuel Pump
- Barrels Require Forced “Jacking” To Remove
- Heavy Deposits on Screw Pump
- Distillates
- ULSFO/Hybrids
- Typical Specs – All Over the Board
- Ulsfos - 2020?
- Testing Recommendations – Circular Friday 11th Jan 2019
- Testing Recommendations
- Oil Majors
- FSC Sample Points
- Handling / Operational Issues
- Blockchain
- Summary
- Case Study
- Illustrative Video
- The Section Quiz