Haward Technology Middle East

Operations of Navigational Aids, Compasses, ARPA Radar, GPS & Echo Sounders

Course Title
Operations of Navigational Aids, Compasses, ARPA Radar, GPS & Echo Sounders

Course Date/Venue
January 11-15, 2026/TBA Meeting Room, The H Hotel, Sheikh Zayed Road, Dubai, UAE
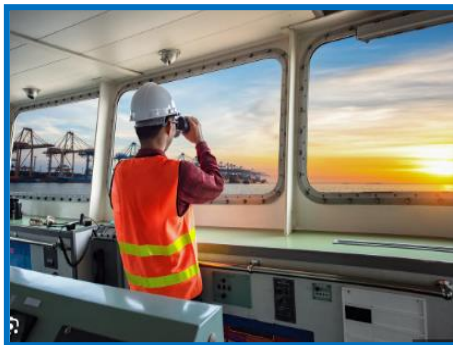
Course Reference
OE0206

Course Duration/Credits
Five days/3.0 CEUs/30 PDHs

*3.0 CEUs (30 PDHs) AWARD*

H-STK© INCLUDED

Course Description

This practical and highly-interactive course includes real-life case studies and exercises 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 of Operations of Navigational Aids, Compasses, ARPA Radar, GPS and Echo Sounders. It covers the marine navigation, navigational aids (AtoN), lighthouses and beacons; the radar reflectors and racon beacons; the AIS (automatic identification system), bridge resource management (BRM) and magnetic compass construction and operation; the compass errors and corrections, gyro compass principles, errors and corrections; the integration with navigation systems and emergency steering and compass failure procedures; the pulse generation and propagation, X-band versus S-band radars and range resolution; and the beam width and blind sectors and shadowing

During this interactive course, participants will learn the radar controls and display modes; the ARPA target acquisition and tracking and collision avoidance techniques; the radar plotting, risk assessment and radar limitations, misinterpretations, GPS principles and signal structure; the DGPS and SBAS corrections, waypoint management, route planning and ECDIS and interface; the navigational warnings and update procedures, electronic navigation risk management and echo sounder operation; the shallow water and under keel clearance; and the integration of multiple navigation systems and emergency navigation techniques.
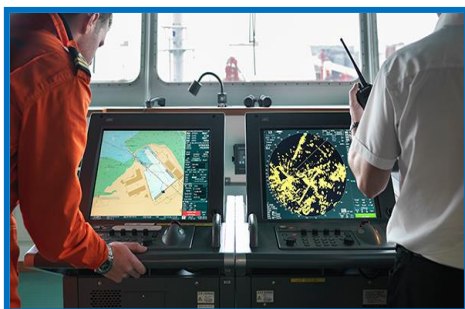
Course Objectives

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

- Apply and gain an in-depth knowledge on operations of navigational aids, compasses, ARPA radar, GPS and echo sounders

- Discuss marine navigation, navigational aids (AtoN), lighthouses and beacons including radar reflectors and racon beacons

- Define AIS (automatic identification system) and bridge resource management (BRM) and carryout magnetic compass construction and operation

- Recognize compass errors and corrections, gyro compass principles and gyro errors and corrections

- Integrate with navigation systems and apply emergency steering and compass failure procedures

- Discuss pulse generation and propagation, X-band versus S-band radars, range resolution and beam width and blind sectors and shadowing

- Carryout radar controls and display modes, ARPA target acquisition and tracking and collision avoidance techniques

- Employ radar plotting and risk assessment and recognize radar limitations, misinterpretations, GPS principles and signal structure

- Illustrate DGPS and SBAS corrections, waypoint management and route planning and describe ECDIS overview and interface

- Apply navigational warnings and update procedures, electronic navigation risk management and echo sounder operation

- Carryout shallow water and under keel clearance, integration of multiple navigation systems and emergency navigation techniques

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 is designed to provide an up-to-date overview of knowledge on operations of navigational aids, compasses, ARPA Radar, GPS and echo sounders for deck officers and navigators, vessel masters and ship operators, maritime safety officers and other technical staff.

Course Fee

US$ 8,000 per Delegate + **VAT**. 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

Haward's 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**. Haward's certificates are internationally recognized and accredited by the British Accreditation Council (BAC). 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:

Captain Sergey Kole, is an **International Expert** in **Port Operations & Logistics Management** with over **25 years** of **onshore** and **offshore** experience within the **Oil & Gas**, **Petroleum** and **Refinery** industry. His expertise widely covers in the areas of **Anatomy of Shipping**, **Logistics & Transportation Planning** Methods, **Forecasting Logistics** Demands, Visual Network Model, **Logistics Operations**, **Tanker Vetting & Inspection**, **Marine Vetting & Audit Criteria Manual** for **Tank Ships**, **Marine & Ship Vetting**, **Vetting Process & Marine Safety Criteria**, **Tanker Vetting** for **Terminals**, **Ship Vetting**, **Marine Terminal** Operations & Management, **Marine Hazards** Prevention & Control, **Marine Communication** Systems, **Marine Safety**, **Ship** Management, **Oil Terminal** Planning, **Vessels** Operations, **Terminal** Management & Support Operations, **Oil Spill Contingency & Emergency Response Plan**, **Qualitative & Quantitative Risk** Assessments, **Terminal** Planning, **Oil Tanker Storage** Planning, **Cargo Transfer** Handling, Loading & Discharging, **Ballasting**, **Tank** Cleaning, **Crude Oil Washing**, **Ship** Handling, **Radar** Navigation, **Navigational** Aids, **Meteorological** Data Review, **Sea & Weather** Condition Monitoring, **ERT Vessel** Coordination and **Transport & Distribution Carrier**. Further, he is well-versed in **Sea-going** Personnel Human Resource Management, **Survival Craft & Rescue Boats**, Dynamic Positioning, Anti-Piracy Preparedness & Response, **Shipping** Maintenance System, **Oil & Chemical Tanker**, **Liquefied Gas Tanker**, **Inert Gas** System, **Crude Oil** Tanker & Gas Carrier, Offshore Logistics & Supply Management, **Marine Fleet** Management & Operations, **International Maritime Conventions & Codes**, **Marine Radar**, **Port Traffic Control** Systems & Instrumentation, **H^{2}S** Hazard Awareness, **Firefighting**, Medical Care Onboard, Carriage of Dangerous & Hazardous Substances and **Ballast Water & Sediment** Management.

During his career life, Captain Sergey has gained his technical and marine expertise through various challenging key positions such as being the **Captain**, **Operations Director**, **Project Manager**, **Port Supervisor**, **Master** of General Cargo Ship, **Master** of Container Ship, **Chief Officer**, **Marine Operations Specialist**, **Marine Coordinator**, **On-call Duty Officer**, **Crewing Consultant**, **2nd Officer**, **Ship Chandler** and **Senior Instructor/Trainer** for several international companies such as **ZADCO**, **AMEC Foster Wheeler**, Fircroft Engineering Services, Ltd., Rusalina Yacht Company, Van Oord Offshore, Exxon Neftegaz Ltd (ENL), Jr Shipping, Carisbrooke Shipping, Unicorn Petrol ve Kimya, Q Shipping BV, m/v Tradeport, Miedema Shipping CV, Rah Management BV, Petrobulk Maritime Inc., Empross Lines Ship Management, Melcard Ltd., Aquarian Shell Marine Inc., Mercy Baaba and Square Ltd.

Captain Sergey has a **Bachelor's** degree in **Navigation** in **Nautical Studies** from the **Kiev State Academy** of **Water Transport**, **Ukraine** and holds a **Master Mariner** (Unlimited) Certificates of Equivalent Competency from the MCA, UK and NSI, Netherlands. Further, he is a **Certified Instructor/Trainer**, a **Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership & Management** (**ILM**) and has delivered various trainings, courses, seminars, workshops and conferences internationally.

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 workshop for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1:   ***Sunday, 11th of January 2026***

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	**PRE-TEST**
0830 – 0930	***Introduction to Marine Navigation*** *Importance of Safe Navigation • Types of Navigation (Terrestrial, Celestial, Electronic) • Role of Officer on Watch (OOW) • Common Navigation Errors and Risks*
0930 – 0945	*Break*
0945 – 1030	***Navigational Aids (AtoN) Overview*** *Categories: Visual, Radio, Electronic • IALA Buoyage Systems (Region A & B) • Fixed and Floating Aids • Chart Symbols and Identification*
1030 – 1130	***Lighthouses & Beacons*** *Operational Principles • Light Characteristics (Fl, Iso, Oc, Mo) • Range and Visibility Factors • Maintenance & Reporting Failures*
1130 – 1215	***Radar Reflectors & Racon Beacons*** *Purpose and Working Principle • Types of Racons & Identification on Radar • Advantages & Limitations • Integration in Collision Avoidance*
1215 – 1230	*Break*
1230 – 1330	***AIS (Automatic Identification System)*** *Class A versus Class B • Data Transmitted & Interpretation • Limitations & Spoofing Risks • AIS Overlays on ECDIS/Radar*
1330 – 1420	***Bridge Resource Management (BRM)*** *Role of Teamwork in Navigation • Lookout Procedures • Communication Protocols • Decision-Making Under Stress*
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, 12th of January 2026**

0730 – 0830	**Magnetic Compass Construction & Operation** Components and Working Principle • Liquid versus Dry Card Types • Flinders Bar, Soft Iron Correctors • Care & Maintenance
0830 – 0930	**Compass Errors & Corrections** Variation vs Deviation • Swinging the Compass • Deviation Card Preparation • Compass Adjustment Limits
0930 – 0945	Break
0945 – 1100	**Gyro Compass Principles** Physics of Gyroscopic Inertia • North-Seeking Behavior • Gyro Repeater Systems • Settling Time & Initialization
1100 – 1215	**Gyro Errors & Corrections** Latitude Error • Speed Error • Course Error • Comparing Gyro & Magnetic Bearings
1215 – 1230	Break
1230 – 1330	**Integration with Navigation Systems** Compass Feeds to ARPA & Autopilot • ECDIS Compass Settings • Alarm System Management • Redundancy & Failure Procedures
1330 – 1420	**Emergency Steering & Compass Failure Procedures** Switching to Magnetic/Manual Steering • Use of Bearing Compass & Hand Compass • SOLAS Requirements • Real Case Studies
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, 13th of January 2026**

0730 – 0830	**Radar Fundamentals** Pulse Generation & Propagation • X-Band vs S-Band Radars • Range Resolution & Beam Width • Blind Sectors & Shadowing
0830 – 0930	**Radar Controls & Display Modes** Gain, Clutter, FTC, Anti-Sea/Anti-Rain • True vs Relative Motion • Head-Up, North-Up, Course-Up • Range Scales & Selection
0930 – 0945	Break
0945 – 1100	**ARPA Target Acquisition & Tracking** Manual vs Automatic Acquisition • CPA/TCPA Concept • Lost Target Alarms • Vector Modes (True/Relative)
1100 – 1215	**Collision Avoidance Techniques** Stand-On and Give-Way Scenarios • Trial Maneuvering (Trial Mode) • Parallel Indexing • Overtaking & Crossing Situations
1215 – 1230	Break
1230 – 1330	**Radar Plotting & Risk Assessment** Manual Plotting Sheet Use • Relative Motion Vectors • Closest Point of Approach Calculations • Identifying Collision Risk Early
1330 – 1420	**Radar Limitations & Misinterpretations** Multipath & False Echoes • Blind Speeds & Target Swap • Sea Clutter Interference • Human Errors in Interpretation
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:   **Wednesday, 14th of January 2026**

0730 – 0830	**GPS Principles & Signal Structure** *Satellite Constellation • Trilateration & Time Positioning • Receiver Components • Fix Accuracy Levels*
0830 – 0930	**DGPS & SBAS Corrections** *Differential GPS Stations • RTCM Corrections • WAAS, EGNOS & GAGAN Systems • Reliability Factors*
0930 – 0945	*Break*
0945 – 1100	**Waypoint Management & Route Planning** *Entering and Modifying Routes • Cross-Track Error Correction • Leg-to-Leg Transition • Arrival Alarms*
1100 – 1215	**ECDIS Overview & Interface** *ENC vs RNC Charts • Safety Depth & Contours • Chart Overlays (AIS, Radar, Tide) • Alarms and Safety Parameters*
1215 – 1230	*Break*
1230 – 1330	**Navigational Warnings & Update Procedures** *NAVTEX Integration • Notices to Mariners • Voyage Planning Compliance • SOLAS Chapter V Requirements*
1330 – 1420	**Electronic Navigation Risk Management** *GPS Spoofing & Jamming Threats • Cybersecurity in Navigation • Overreliance on Automation • Bridge Blackout Procedures*
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:   **Thursday, 15th of January 2026**

0730 – 0830	**Echo Sounder Operation** *Transducer Types (Single/Dual Frequency) • Sound Velocity Principles • Recording Modes & Alarms • Sediment Error Management*
0830 – 0930	**Shallow Water & Under Keel Clearance** *Squat & Trim Effects • UKC Calculation • Tidal Corrections • Shallow Water Echo Behavior*
0930 – 0945	*Break*
0945 – 1100	**Integration of Multiple Navigation Systems** *Data Flow Between GPS, ARPA, AIS, ECDIS • Bridge Console Setup • NMEA Protocols & Trouble Checks • Redundancy Handling*
1100 – 1230	**Emergency Navigation Techniques** *Dead Reckoning Without GPS • Bearing Fixes Using Compass • Depth Contour Navigation • Chartwork & Plotting*
1230 – 1245	*Break*
1245 – 1300	**Case Studies on Navigation Accidents** *Grounding Incidents • Radar Misinterpretation Case • GPS Failure Scenarios • Human Factor Analysis*

1300 - 1345	***Simulator-Based Navigation Exercises / Practical Assessment*** *Collision Avoidance Drill • Route Monitoring Simulation • Emergency Blackout Drill • Instructor Debrief & Evaluation*
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 real-life case studies and exercises:-

Course Coordinator

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