Nr……Prot. Vlorë,më 26 .03.2015

INVITATION FOR QUATION

Tempus project titled: Modernizing and harmonizing maritime education in Montenegro and Albania, "MARED", code 544257-TEMPUS-1-2013-1-ME-TEMPUS-JPCR (2013 - 4538/001-001)

Title of contract : **Supply procurement and installation of Navigational and Engine Room Simulator for University of Vlora, Faculty of Technical Sciences.**

Name and Address of the Contracting Authority:

Name	Universiteti "Ismail Qemali"Vlore, Fakulteti i Shkencave Teknike
Address	Lagjia "Pavaresia",Rruga Kosova, Vlore
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Place and date of publication of the invitation :
Internet Address www.univlora.edu.al

Date 27.03.2015

Description Of Public Procurement: **Supply procurement and installation of Navigational and Engine Room Simulator for University of Vlora, Faculty of Technical Sciences, in the framework of: "TEMPUS PROJECT " Modernizing and harmonizing maritime education in Montenegro and Albania, "MARED", code 544257-TEMPUS-1-2013-1-ME-TEMPUS-JPCR (2013 - 4538/001-001).**

Supply	Unit	Quantity
PC Desktop Computers, 12 pieces	Piece	12
PC Monitor 22"	Piece	12
Kit: Server (1 piece) with hub (2 pieces) and cable network	Piece	1
Full Navigational Simulator Software (ECDIS) Students Edition (Solo) 9 computers + Installation and Training of simulator	Piece	1
Engine Room Simulator Students Edition (Solo) 10 computers + Installation and Training of simulator	Piece	1
Ship Digital Portable Inclinometer (3 pieces)	Piece	3

Ultrasonic Thicknees Gauges for steel range 3 to 150mm	Piece	1
Ship Digital Inclinometer	Piece	3
Digital Thermo-Hydrometer (3pc)	Piece	3
Digital Thermo-Hygrometer (3pc)	Piece	3
IMO illuminous labels (fire fighting, solas, deck, machine)	Piece	25
Marine fuels and lubricants test equipment (ekuivalent Kittiwake Power Plant Cabinet – Diesel, Water, TBN, Viscosity, Density, Compatibility)	Piece	1

Estimated Value of The Public Procurement: **98500 €**

Eligibility criteria

The candidate / tenderer must submit:

1. A document certifying that (your company):
a) is not in bankruptcy proceedings,
b) has not been convicted of a criminal record,
c) has not been convicted by court of the final decission, related to professional activity. This should be issued by the National Registration Center.

2. A document certifying that (your company):
a) has met fiscal obligations,
b) has paid all social insurance obligations, issued by the Tax Administration.

3. Economic operator must be registered in the relevant professional or trade registers of the state in which they are established demonstrating their legal from. For such a thing candidates should submit a copy of the extract on the subject issued by the National Registration.

4. The average annual turnover during the last three (3) years which must have a value not less than the value of the contract limit fund to be procured.

5. A financial certificate of the situation from one or more banks for liquidity situation which must not be less than 10% of the tender, issued no later than 10 days from the date of publishing the tender.

6. An attestation issued by local authorities for the payment of local taxes provided by Local Authorities.

7. Similar supply to a single contract of the same nature, in an amount not less than 40% of the limit fund performed during the last three years of operator´s activity, with public or private entities associated with receipt / invoice for the fulfillment of the contract.

8. A certificate that confirms the payment of all electricity matured obligations related to the electricity contracts of the economic operator registered in Albania. The non payment of the electricity obligations disqualifies the economic operator, except when the electricity unpaid obligations, confirmed in the certificate issued by the supplier, are under court proceedings. The electricity supplier must issue this certificate not later than 5 (five) days from the submission of the request by the economic operator.

9. For the goods of unit costs of more than 5.000 EUR the Rule of Origin must be respected and the Certificate of Origin must be provided (EU+WBC+ countries participating in the project). Also, for the goods of unit costs of less than 5.000 EUR the rule is to be respected, but no Certificate of Origin is required (the certificate of origin must be made out by the competent authorities of the country of origin of the supplies and must comply with the rules laid down by the

relevant Education, Audiovisual and Culture Executive Agency legislation and attached documentation – Grant Agreement (art. I.10.1), Guidelines for the Use of the Grant (point 5.5) and Frequently Asked Questions (FAQ No.51)).

10. The Procurement procedure will be considered as successfully realized if complete and valid tendering documentation and proof for three quotations are provided (Guidelines for the Use of the Grant – point 5.7).

11. The criteria for the choice of the best bid:

the lowest offered price **X**
economically the most favourable bid

1. **Deadline and address of the bid submission:**
Date: **06 .04.2015 time: 10:00**

Address: **Universiteti "Ismail Qemali"Vlore,** Zyra e Protokoll-Arshives

Offers can be submitted by registered post with return receipt.

2. **Forms to be submitted**:

- Bid security, 2% of the Procurement value (€ 98,500). (The validity of the bids will be 150 days).
- Statement on meeting the technical specifications (including guarantees) set by the contractor authority, (including the period of 6-month warranty for the goods).
- Statement on acceptance of the terms set forth by the contactor authority. (Annex 1)
- Description of the completed price and signed.
- Bid declaration form.
- The offer must include: name of the bidder, tax identification number, bank account number, company stamp and authorized signature. The offer must include full technical specifications of goods provided which must be a minimum in accordance with the technical specifications required from us. The offer must specify: the duration of its validity, the manner of payment, the time and place of delivery.

To the attention of economic operators

- The tender will continue if submitted at least three qualified bidders.
- Evaluation of bidders within 5 days from the submission of bids
- Appeal within 7 days from the final classification.
- After reviewing administratively the complaints within the deadline of 30 days, the contract should be signed between the winner and the institucion (the signed contract should be published).
- Time of Delivery 45 days
- Each document of this procedure must be on two copies (original and copie)
- Each document of this procedure must be bilingual (English or Albanian)
- Documentation translated without seal and authorized translator will not be considered.
- The Fund of € 98,500 does not include VAT and Taxes. VAT is 0 (Zero) under TEMPUS projects.
- The Offeror who will be ranked first must submit a bank guarantee for the progress of the contract on the value of 10% of the price offered by him which is sent on the date of contract signing and will be valid for three days after the expiration of the contract.
- The place of the realization of the contract: University "Ismail Qemali" Vlore, Faculty of Technical Sciences.

- Payment shall be made within 30 days after delivery of equipment, based on the invoice and the record of the delivery of equipment.
- An integral part of this procedure are also the following documents :
  - Guidelines for the use of grants from Tempus projects
  - Partnership Agreement
  - Projects Tempus IV - Supply procurement

Annex I

Statement on acceptance of the terms set forth by the contactor authority

We offer the following products _____ for procurement , for the offered prices
Included in the whole costs and reduction for : _____ net price €
_____ € reduction (if offered) _____ € reducted price (if offered)
_____ € VAT-
_____ € Total offer price[sum in numbers] Total offer price_____ € [sum in words]
In case of acceptance of our offer, we will ask not for a change in the offered price.
For the offered goods / , we provide the warranty period: _____ months
Delivery time /, which is subject of public tendering, will be _____after signing the contract.
We accept all the conditions that are provided in the tender documents, which are published for bid preparations.
The period of validity of the offer is _____ days
Authorized signature _____

Name and title of signatories : _____

Name of the Bidder :_____
Address: _____
Signature Date: _____ / _____ / _____

(Note : If the offer is submitted by a group of bidders, each member of it must sign.)

Annex 2

Technical Specification

Supply and installation of Navigational and Engine Room Simulator for University of Vlora, Faculty of Technical Sciences

Introduction

Tender comprises supply of software for Navigational and Engine Room Simulator, installation at Faculty location and training of instructors.
Both Navigational and Engine Room Simulator are of classroom type run on standard PC equipment. Instructor station is required for training process management, including exercise or exercise scenario creation, On-line interaction with Trainee workstations, dynamic changing of exercise conditions.

Navigational Simulator

Navigational Simulator to be organised as classroom and suitable for various types of training including: Equipment familiarisation, Interactive individual and group exercises under instructor supervision; ARPA/Radar, ECDIS, AIS, basic navigational with electronics equipment.
Navigational Simulator must comply with latest STCW requirements and to hold Statement of Compliance according DNV Class A-Standard for Certification of Maritime Simulators No 2.14 or equivalent certification of other IACS member body. Furthermore manufacturer of Navigational simulator software must have ISO 9001 and ISO 12207 certification in order to assure quality control and maintenance of simulator software.
Navigational Simulator consist of instructor station and 10 student stations. Each student station comprises of following training modules: conning station with simulation of ships controls, propulsion and instruments; ECDIS module and ARPA/Radar module

Engine Room Simulator

Engine Room Simulator to be organised as classroom and suitable for various types of engineer students training including: Engine room equipment familiarization; System layout and flow diagrams; Control of the machinery; Control system, automation, alarm and safety system; Watch-keeping and troubleshooting; Emergency operations; Emission control and fuel economy management and Energy management.
Engine Room Simulator consist of one engine room software model, instructor station and 10 student stations. Each student station must have capability to display information pages of one monitor and to run separate instance of engine room model.

Detailed specification and list of supplies

Item	Description	Qty	Compliance
1	PC Desktop Computers, with following main characteristic: Microtower, Intel Celeron G1840 2.8GHz, Intel H81 Express, 4GB 1600MHz DDR3 SDRAM, 500GB 7200rpm SATA, Intel HD Graphics, DVD SuperMulti, Gigabit Ethernet, Windows 7 Professional 64-bit/Windows 8.1 Pro, Keyboard and Mouse	12	
2	PC Monitor 22", with following main characteristic: Display features Plug and Play; Anti-glare; User programmable; Language selection; On-screen controls; LED Backlights Display size (diagonal) 21.5" Drive Description Plug and Play; Anti-glare; User programmable; Language selection; On-screen controls; LED Backlights Environmental Compliance ENERGY STAR® qualified Input signal 1 VGA; 1 DVI (with HDCP support) Response Time 5 ms on/off Tilt and Swivel Angle Tilt: -5 to +25° View Angle 170° horizontal; 160° vertical	12	
3	Kit: Server (1 piece), with following main characteristic: Intel Core i5-4590S 3GHz, Intel H81 Express, Microtower, 4GB 1600MHz DDR3 SDRAM, 500GB 7200 rpm SATA, Intel HD Graphics 4400, SATA SuperMulti DVD, Gigabit Ethernet, Windows 7 Professional 64-bit/Windows 8.1 Pro Hub (2 pieces) , with following main characteristic: Address table size 8000 entries Form Factor 1U height Ports 16 RJ-45 autosensing 10/100/1000 ports; Supports a maximum of 16 autosensing 10/100/1000 ports; Included Cable network Set of CAT 6 network patch cables length 5 to 25m	1	
4	Navigational Simulator Software Navigational Simulator to be organised as classroom and suitable for various types of training including: Equipment familiarisation, Interactive individual and group exercises under instructor supervision; ARPA/Radar, ECDIS, AIS, basic navigational with electronics equipment. Navigational Simulator must comply with latest STCW requirements and to hold Statement of Compliance according DNV Class A-Standard for Certification of Maritime Simulators No 2.14 or equivalent certification of other IACS member body. Furthermore manufacturer of Navigational simulator software must have ISO 9001 and ISO 12207 certification in order to assure quality control and maintenance of simulator software. Navigational Simulator consist of instructor station and 10 student stations. Each student station comprises of following training modules: conning station with simulation of ships controls, propulsion and instruments; ECDIS module and ARPA/Radar module		
4.1	Statement of Compliance according DNV Class A-Standard for Certification of Maritime Simulators No 2.14 or equivalent certification of other IACS member body for Navigational Simulator Software	1	
4.2	ISO 9001 certificate for manufacturer of Navigational Simulator Software for quality control of simulator software.	1	

4.3	ISO 12207 certificate for manufacturer of Navigational Simulator Software for maintenance of simulator software.	1	
4.4	INSTRUCTOR STATION SOFTWARE MODULE General Capabilities: • Integrated application for creating, editing, explaining the trainee mission, exercise fulfilment and debriefing; • High accuracy data presentation on the basis of vector charts (capability to automatically load all the charts referring to the selected gaming area); • English language user interface; • Facilities for creating an exercise and automatic competency assessment scenario; • Control of simulator session(s); • Continuous automatic recording of data in the course of the exercise; • Capability to create log-script with chosen moments of the exercise to replay them later; • Real, slow and fast time modes; • Capability to display and print out a new pilot card and a table of the ship manoeuvring characteristics; • Capability of to turn on Track mode and to set the track prediction mode Trend mode for all the exercise objects (Global settings) and for one object (Local settings); • Graphic presentation of ship motion parameters; • Graphic presentation of CPA/TCPA; • Capability to add unlimited number of naming mark point with the description; • Capability to display horizontal depth cross-sections; • Capability to set global scale factor for all current fields; • Working with measurement tools • NAVTEX functionality: • Working with routes: • Capability to move the own ship during exercise fulfilment without ship grounding and collision; • Capability to apply named virtual tug force to any point of the ship hull in any direction along the waterline; • Capability to display point of ship rotation and pivot point; • Capability to import tidal currents in the text format (from the Admiralty TotalTide database); • The continuous display of the ship motion parameters and environmental conditions; • Independent instructor control for a wind-generated and swell components of the wave; • Capability to exclude hydrodynamic interaction with mooring walls in the required area; • Capability to create a template containing a set of objects (ships), to save and use this template in other exercises; • Capability to tow oil rig; • Capability to save environment condition settings as a template and to load previously saved template in any exercise and area; • Capability to display the wind and current diagram (set of vectors above a ship hull); • Control of navigational lights and shapes: • Control of multi-level locks: • Control of semaphores: • Tactical object image editor (bitmap editor); • Capability to set a tactical object (ship) image on the chart; • Capability to obtain data on chart objects (Chart info);	1	

	• Capability to plot user information (lines, text, circle, zone, etc.) on the chart (User layer); • Capability of plotting of navigational buoys from the simulator collection; • Capability to set font size for the object names on the chart; • Capability to set the minimum scale for the display of a tactical object image on the chart; • Capability to set the maximum visibility range within which the navigational lights turn on automatically on the ships; • Capability to use the "Enter" key on the keyboard instead of pressing "Apply" button; • Capability to set a user set of alarms specified via xml-file, and to activate them; • Capability to define user set of alarms via special panel; • Capability of training the procedure of ordering the electronic charts from the trainee workplace (Chart Server); • Ability to set predefined parameterized SAR routes of four types for own and target ships and tugs; • Weather conditions manager; • Capability of setting the advanced wind shading model.; • Capability of using thunderstorm, precipitation Explaining trainee mission: • Loading a previously created exercise onto the chart; • On-chart exercise playback for explaining the mission; • Loading a sample log file of the same exercise to explain correct actions Control of simulator session(s): • Assignment to own ship bridges in accordance with separate, joint and common voyage scenarios; • Common scenario – assignment to several bridges of the same own ship; • Exercise(s) start, pause, re-start after the pause, stop on the bridge(s); • Setting initial position for the own ships, received from the real GPS receiver; • Input of failures of navigational systems, steering gear, propulsion plant, fire and general alarm; • Capability to set faults and of navigational equipment distributed in time (programmable faults) and to save them in exercise scenarios; • Pulling apart ships which have collided or run aground; • Control of target vessels, hoisting of International Code of Signals flags and NATO Navy flags as well as switching on their sound signals, and turning lights ON/OFF on them; • Unlimited number of special signals (sets of flags) set by the user via the configuration file. • Controlling daylight shapes on vessels, • Producing distress signals (flare, smoke signals, dye markers); • Change of weather conditions; • Adding new target ships; • Moving buoys, turning off lights on them and hiding them both, on the visualization and on the radar; • Control of automatic tugboats with commands from the bridge or from the Instructor; • Setting behaviour of automatic tugs - maximum acceleration limitations, colour scheme for the autotugs statuses; • Saving situations which may be interesting for the future training in the form of new exercises; • Using the Diagram instrument for the real-time monitoring of the ship motion		

	parameters, including export to csv-file in any moment; • Using the Report Generator Wizard instrument for quick export of the data from log files to csv-files, or for a quick retrieving of log files from the exercises without running them on the bridge. Exercise debriefing: • Including additional information in the log files (bridge, comments); • Playback of log files for exercise debriefing on the instructor chart; • Playback of log files for exercise debriefing on the bridge(s); • Playback of log-scripts, containing the chosen log-files' moments in the desired order with ability to show comments; • Saving situations interesting for the future training in the form of new exercises; • Printing out the chart with tracks of all the exercise objects; • On-screen display and printing out of reports with exercise results; • Saving reports in Microsoft Excel format to enable creations of graphs; • Capability to create "virtual force" report; • Graphical (diagrams) and tabular form of printout ship motion parameters. UAIS training: • Capability to set up parameters of own ships and targets for UAIS Position, Ship Static and Voyage Related Data reports; • Capability to set up parameters of helicopter targets for UAIS Standard SAR Aircraft Position reports; • Capability to set up parameters of VTMS station for UAIS Base Station reports; • Capability to send UAIS messages from targets to own ships and VTMS stations; • Capability to monitor exchange of UAIS messages; • Capability to enter malfunctions into UAIS transponder.		
4.5	Simulator interactive display, with following main characteristic: • Infrared technology (pen and finger touch) • Active Area Size 223.52 cm (88 in) • Aspect ratio 16:10 • Projector source FullHD resolution, 2000 ANSI lumen	1	
4.6	SHIP MOTION SIMULATION SOFTWARE Ship motion models can be used in the simulator as own ships and ship targets. Capability to use simulator model for following purposes: • Maneuvering during the sea passage, on the anchorage, in rivers, lakes and sea fairways; • Maneuvering in sea and in restricted conditions; • Sailing and maneuvering in narrows and port waters; • Towing operations; • Mooring operations; • Sailing and piloting vessels in ice channel; • Docking, passing through locks • Rescue operations: stranding and getting off the shallow; • Anchor operations, including positioning of floating objects with the help of anchors; • Using of complex steering and control systems, such as DP system, and specific propulsion systems – push-pull boats, tugs with flanking rudders; • Surviving the storm; • Other training types, including combination of the above tasks.	1	

	General: • 6-DoF ship motion equation; • Hull hydrodynamic model; • Stability and flotation model; • Air cushion model; • Heel tank model; • Ballast tank model; • Hull aerodynamic model; • Main engine model; • Propulsive agent model; • Active steering devices model; • Rudder model; • Engine model; • Model of environmental effects (wind, waves, current); • Model of shallow water effect; • Model of 6-DoF pitch, additional wave resistance and drifting effect; • Wave roll/pitch model; • Wind-generated and swell wave model; • Model of the distributed current effect; • Model of hydrodynamic interaction with other ships (tugboats, barges) and geographical peculiarities of the area; • Model of mechanical interaction with other ships (tugboats, barges) and mooring walls; • Anchor model; • Model of multi-functional autopilot; • SMM incorporates the following model types: displacement ships, semi-glider ship, catamaran ships, tugs, barges, helicopters and aircrafts; • Models are based on the actual prototypes and are adjusted from the data of sea and tank tests (if available). Effects: • Shallow water effect on the hydrodynamic properties of the hull, propulsive agents/propeller and helms; • Shallow water effect on changing the propulsive quality; • Squat effect; • Hydrodynamic interaction with other ships (tugboats, barges) and geographical peculiarities of the area (uneven seabed, shoal, mooring wall); • Hydrodynamic interaction between the ship and waterway boundaries (walls, inclined bottom, channels, underwater banks); • Ship collision with a ship (tugboat, barge); • Ship bump with mooring walls and aids to navigation; • Grounding; • Soft grounding effect; • Navigation in muddy strata areas; • Lock effect; • Enhanced Planing Effect; • Air cushion effect; • Propeller going of water. Propulsion types: • FPP; • CPP;		

	• Air propeller; • Voith-Schneider propeller; • Z-drive propeller; • Propeller in steering nozzle; • Water jet; • Turntable steering device (AZIPOD, Aquamaster); • Tunnel thrusters; • Swing-down thrusters; • Reversible and non-reversible clutch Engines: • Low and medium RPM reversible diesel engines (compressed air reversing); • Medium and high RPM non-reversible diesel engines (reversing with reversing clutch); • Steam and gas turbines; • Diesel electrical engine for special objects; • Outboard engine. Steering systems: • Conventional rudder (balanced, semi-balanced); • Flanking rudder; • Becker rudder; • Shilling rudder; • Steering nozzle; • Turntable nozzle. SOUND SYSTEM • The program generates stereo or 3-D sound (it depends on sound card type) in the observer position; • Direction and distance to the source of the sound are taken into account. • Sound propagation model: Generator of NMEA messages (NMEA interface)		
4.7	CONNING DISPLAY SOFTWARE MODULE Main features: • Multi-page display intended for shiphandling on the navigation bridge; • Conning display multilevel 'Call-up' pages: Info Card, Man Info, Instruments (Autopilot, Echo Sounder, Gyro, Log, SSAS), Signals (Nav Signals, Flags), Nav Aids (GPS, UAIS MKD, Loran-C, MF DF), Alarms (General Alarms, Engine Alarms, Steering Alarms), Moor (Anchors, Ropes, Tugs and Mooring chart), SAR (Distress Signals, SAR DF), CAS; • During the operation, ship controls are available from any of conning display pages on its permanently presented part; • Conning Display buttons displaying ship equipment pages have flickering backlighting with the generation of an alarm referring to the operation of the relevant equipment, which allows the source of the alarm in question to be promptly identified during the work with other stations • The conning display has a digital clock and the exercise progress status bar which automatically shows messages about readiness for the exercise start, about fulfilment of the exercise, grounding, collision with another ship and about a dangerous bump against the berth;	10	

	• Brightness control for the entire conning display and its indicators. Info Card page: • Contains the following ship information: ship particulars, stopping characteristics (for vessels with multi-load conditions - depending on condition used), turning ability characteristics, magnetic compass deviation table, 3-D antenna position (coordinates) of sensors; • Separately 'Call-up' Pilot Card page and table of ship maneuver characteristics. Man Info main page: • Display of Gyro/Magnetic compass; • Display of ship controls and indicators for the ships with the following propulsion types: FPP (single screw), CPP (single screw, twin screw), Z-drive, Voith Schneider, Water jets, Tunnel thruster, azipod; • Controls of visualization and binoculars. Instruments\Autopilot sub page: • Capability to select a type of the simulated autopilot panel in the phase of system configuration: generic Transas autopilot or Anschuts autopilot panel; • Autopilot panel contains the following ship motion control modes • Input of adjustment coefficients. Instruments\Echo sub page: • Imitation of navigational echo sounder recorder; • Capability to switch to the second sensor (transducer) if it is available on the ship in question. Instruments\Gyro sub page: • Imitation of gyro compass recorder; • Ability to switch to secondary gyro sensor. Instruments\Log sub page: • Imitation of Doppler log indicator: speed through water, speed over ground (longitudinal, transverse at the bow and stern), selectable measuring units (knots, m/sec), overall log readout and passed distance alarm. Instruments\SSAS sub page: • Simulation of Satamatics SAT-101 Ship Security Alert System (SSAS) compliant with the latest SOLAS requirements (SOLAS XI-2 Regulation 6 – as amended), as well as: • International Port and Ship Security (ISPS - 2002) Code; • MSC – Resolution 136/76 – Performance standards; • MSC – Resolution 147(77) – Annex 7 – Performance standards; • MSC Circular 1072. • SSAS supports the following modes: • Switching on; • Stand-by; • Alert mode; • Test mode; • Alert reset; • Switching off. Instruments\EPC sub page: • Imitation of two diesel generators;		

	• Possibility to manually stop and start main generators; • Possibility to monitor current machinery mode - normal and emergency. Instruments\Eco sub page: • Sensors of the emission parameters; • Fuel and air consumption usage meters. Signals\Nav Signals sub page: • Control of ship navigation lights and daytime shapes; • Control of deck lights; • Release of lifebuoy from port and starboard side; • Control of sound signals (manual and automatic); • Control of signalling lamp; • Control of ship searchlight; • Life buoy release buttons (port and .starboard). Signals\Flags sub page: • Diagrammatic presentation of the portside and starboard halyards with signals hoisted on them; • Page for selecting alphabetic flags, numeral pennants, special flags and pennants, signals set by the user via the configuration file (Signal Codes), substituted and answering pennants, tack line; • Page for controlling red flashing stopping light for ice-breaking vessels; • Panel for setting alphabet, numeral and special NATO Navy flags if available on the ship in question; • Controls for lowering and hoisting signals in accordance with the International Code of Signals; • Giving signals manually and automatically in accordance with the International Code of Signals by using light (searchlight) and sound (tyfon) Morse code; • Controls for setting a relative bearing for giving light signals. Navaids/GPS sub page: • Simulation of Furuno GP-90 GPS Navigator fully meeting IMO MSC. 112(73) and IEC 61108-1 regulations; • WGS-84 geodetic datum is used; • GPS Satellite Almanac and DGPS land station database; • DGPS capability with built-in DGPS beacon kit; • Comprehensive navigation data displays; • Man overboard feature records latitude and longitude coordinates at time of man overboard and provides continuous updates of range and bearing to that point; • Storage for 999 waypoints and 30 routes; • Memory stores 2000 points of track and marks; • Alarms: Waypoint Arrival, Anchor Watch, Cross Track Error, Ship's Speed, Trip, and DGPS; • Menu-driven operation; • Position is shown in latitude and longitude coordinates; • 4 display modes: Plotter 1, Plotter 2, Highway and Navigation; • "Highway" display provides perspective view; • 3 GPS monitor displays: satellite monitor, beacon receiver monitor and DGPS beacon station message monitor;		

	• Data generated by this module is transferred to the ECDIS, Radar/ARPA and Autopilot; • Faults and errors controlled by the instructor: power failure, quantity of satellites, DGPS data error, dilution of precision. Navaids/UAIS MKD sub page: • Display of navigational aid imitator UAIS MKD McMurdo/Transas T102 VDU with limited IAIS functions; • Simulation of Class A Shipborne Mobile Equipment compliant with the latest IMO SOLAS requirements: o IMO MSC. 74(69) Annex 3; o ITU-R M.1371-1 (Class A); o IALA Technical Clarifications of Rec. ITU-R M.1371-1 (Edition 1.3); o ITU-R M.825-3; o ITU-R M.1084-3; o Complies with part of the Vessel Tracking and Tracing Standard for Inland Navigation (Edition 1.01) requirements. • Text user interface; • Capability to view received targets on a graphical, radar-like display; • Capability to enter Static (MMSI and IMO number, Ship Type, Call Sign), Dynamic (Navigational Status) and Voyage Related Data (Cargo Type, Draught, Destination, ETA, Number of Persons on Board); • Capability to enter ship's main external and internal GPS antenna location; • Capability to transmit and receive short safety related messages regarding navigation safety; • Capability of composing and sending message with report of ETA at lock/bridge/terminal, shown on the Instructor workplace; • Capability to filter incoming messages. Navaids/Loran-C sub page: • Display of navigational aid imitator Loran-C Furuno LC-90 MARK-II receiver; • Data generated by this module is transferred to the ECDIS, Radar/ARPA and Autopilot; • Automatic search for the best chains of stations and the best two pairs of stations; • Statistics database on the adjustment and acquisition time, and tracking modes at different distances from the stations, in different seasons and at different time of the day; • Automatic filtering, automatic indication of measurements, accuracy reduction and signal attenuation; • Automatic TDs to L/L and L/L to TDs co-ordinate converter; • WPs navigation; • Memory mode; built-in testing of measurement channels operation; • Warning indication on signal/noise ratio (SNR) and CYC status; • Faults and errors controlled by the instructor: power failure, station fault, ASF, SNR unsteady readouts, sky radio wave, poor signal values; • Loran-C stations and ASF corrections World-wide database. • Navaids/MF DF sub page (absent by default): • Display of navigational aid imitator MF/DF Furuno FD–177 ADF; • Manual operation mode: setting frequency, storing frequency and class of emission in the memory, change speed of search reception and dwell time; • Channel mode: scanning of channel registry, recall of frequency and class of emission; • Scan mode: scanning of memorized channels; • Range measurements with LEDs;		

	• Measurements of the relative and radio bearings; • World-wide radio beacon database; • Correction curve. Alarms/General Alarms page: • Fire detection system alarm; • Sending general and lifeboat alarms; • Alarms adjusted by the user via the xml-file; • Alarm acknowledgement buttons; • Indicator backlight test button. Alarms/Engine Alarms page: • Slowdown and Shutdown Main Engines group alarms; • Alarm acknowledgement buttons; • Indicator backlight test button. Alarms/Steering Alarms page: • Steering system alarms; • Alarm acknowledgement buttons; • Indicator backlight test button. Fire Alarms page: • Fire alarms indicators for 16 different ship's zones; • Buttons for initiating fire-fighting actions (closing fire doors, using of sea water in the fire-fighting system, switching off the engine room fans, activating fire pump); • Alarm acknowledgement buttons; • Indicator backlight test button.		
4.8	RADAR SOFTWARE MODULE Radar module must comply and be certified as complying with the relevant parts of: IEC 62388:2008,"Marine Shipborne Radar Equipment"; Radar Equipment for Standard Speed and High Speed Craft Applications (IEC 62388 Category 1, 2, 1H, 2H) Commission Directive 2009/26/EC; IEC 60945 : 2002,"General Requirements for Marine Navigation Equipment". IMO resolution MSC.192(79) performance standard was taken by the International Electrotechnical Standards Organisation (IEC) and turned into the International Standard IEC 62388, first edition 2008. Display: • Range scales: 0.125 – 96 nautical miles; • Display modes Head Up, North Up, Course Up, TM, RM; • Display of exercise date and time; • Presented display elements: Heading line, Cursor, ERBL, VRM, Parallel index lines, Marks, Range rings, Guard zones, Track history, Vectors (true, relative), Rotating cursor, Root (WP), User charts, ARPA marks; • Video display effects: Target trails, Echo stretch, boost, Echo average, Zoom. • Video presentation effects: 3 and 10 cm transmission bands, change-of-pulse-length effect, gain control effects, receiver pass band tuning effects, sea clutter and its suppression, rain clutter and its suppression, target trails, echo stretch, echo average, scaling. ARPA: • Acquisition modes: manual, automatic (Guard zone);	10	

	• Up to 14 automatic Inclusive and Exclusive zones (sectors) for the Nucleus radar type; • Target cancelling modes: manual, automatic; • Tracking data output time: inaccurate data – 30 sec, accurate data – 3 min; • Simultaneous tracking of up to 100 targets; • Display of target information: RANGE, BEARING, CPA, TCPA, COURSE, SPEED, BOW X, bow crossing range (BCR), bow crossing time (BCT) • Visual and acoustic alarms: BOW CROSSING, CPA/TCPA, GZ1 GZ2, LOST TARGET, and TARGET STORE FULL; • Output of target information in NMEA format; • Setting of CPA, TCPA limits; • Trial manoeuvre; • Showing ARPA data on ECDIS stations for NS 3000/4000, including case of combination of simulated ARPA and NR 4000 on the same bridge;. UAIS training: • Display UAIS target information in accordance with IEC/PAS 60936-5 Ed.1.0 "Guidelines for the use and display of AIS Information on radar". Radar parameters: • Operating frequency (S-band, X-band); • Antenna rpm (12 – 48 RPM); • Azimuth and elevation pattern; • Antenna height and tilt angle; • Blind sectors. Instructor controlled effects: • Display of multiple echoes; • Display of indirect echo; • Interference from other radars; • Increased receiver noise; • Visibility of targets; • Turning on/off of video signal; • Turning on/off of ARPA. Signal components: • Direct echo from ships (tugboats, barges, etc.); • Direct echo from helicopters; • Direct echo from aircrafts; • Indirect echo (echo from ships reflected from the own ship mast); • Multiple echo; • Sidelobe echo; • Echo from the coast and coastal objects; • Echo from aids to navigation (buoys, lighthouses); • Racon signals; • SART signals; • Echo from the rain cloud (rain clutter); • Echo from the sea surface (sea clutter); • Interference from other radars; • Echo from own ship structures. Effects: • Attenuation of signal with distance; • Additional attenuation of signal as a rain cloud is passed; • Shadowing of a ship by another ship;		

	• Shadowing of a ship by the coast; • Shadowing of a costal object by another one; • Curvature of the earth surface; • Loss of targets in heavy sea; • Radar picture change in dependence on ship's rolling and pitching (movement of the antenna in space); • Echo-signals of different range depending on geometry and reflection capability of a shore line; • Change of the coastline contour with the Tidal height; • Reflection from ship structures (multiple and indirect echo); • Shadowing by ship structures (blind sectors); • Transmitting power; • Antenna azimuth and elevation pattern; • Bandwidth; • Pulse length; • Repetition frequency; • Radar gain; • Radar sea clutter suppression; • Radar rain clutter suppression; • Video boost; • Interference rejection.		
4.9	ECDIS SOFTWARE MODULE To comply and be certified with the requirements of the following Regulations/Standards: • Module B in the Directive SOLAS 74 as amended; • IMO Res. MSC 232(82); • IMO Res. A.694(17); • IMO Res. MSC 191(79); • IEC 61174 ed. 3; • IEC 62288 ed. 1. General: • Multichart loading (up to 6); • Chart INFO (General Chart Information, Information on Chart Objects); • Manual chart update ("Professional" Level, User Charts); • Chart orientation (North UP, Head UP, Course UP); • Chart control (Layers Control, Autoload, Autoscale, Autoscroll, Zoom, Chart Formats Priority (ARCS/ENC), 6 Color Palettes); • Alarms (AIS, Antigrounding, Sensors, Route, Radar/Targets (CPA/TCPA), Chart Areas, etc.); • Ship motion data (COG, SOG, HDG, LOG); • ERBL for measuring bearings and ranges; • Two modes of displaying the ship motion on the chart (True Motion, Relative Motion); • Split screen (2 Chart Panel); • MOB mode (Man Overboard mode is intended for the performance of "Man Overboard" manoeuvre); • Route planning, checking and monitoring; • Work with multiple routes; • Schedule calculations; • SAR mode (The mode allows a route to be created in accordance with the following search patterns recommended by the International SAR Convention: Expanding	10	

	Square, Parallel Track / Creeping Line, Sector Search); • UAIS information; • Voyage documenting hard copy support, etc,; • Trial manoeuvring module; • Interface with position sensors, Gyro, Log, Echosounder, ARPA, etc.; • User adjustable NMEA output sentences; • Radar overlay with target extractor functionality; • Help HTML Application; • User configurable GUI; • Multiunit support (Speed, Distance, Depth, Height, Draft, Wind Speed, Temperature); UAIS training: • Display of UAIS targets on the screen; • Full target information; • Sending and receipt of messages and target information; • Fast search of targets by Name, IMO number, MMSI, and Call Sign; highlighting of the selected target on the electronic chart screen. Supported chart formats: • Transas TX-97 (vector); • ENC (S-57 v.3) (vector); • S-57 Primar (vector); • DNC (NIMA) (vector); • BA ARCS (raster); • NDI/BSB (raster); • NOS/GEO (raster); • Seafarer (raster).		
4.10	Exercise area	5	
4.11	Own ship model	10	
5	Engine Room Simulator		
5.1	ENGINE ROOM SHIP MODEL SOFWARE Engine Room Simulator must comply and be designed to meet the requirements of STCW95 Convention and DNV Standard 2.14. or equivalent Based on real LCC with MAN B&W 6S60 MC-C Diesel Engine. Main particulars: • Length, overall – 248.92 m • Breadth, molded – 43.8 m • Designed draft – 14.925 m • Service speed – approx. 15.5 knots at NCR Propulsion: • MAN B&W 6S60MC-C (Doosan Engine) Two strokes, slow speed, turbocharged, reversible main diesel engine, MCR 18,420 BHP at 105 RPM with Electronic Governor • Fixed Pitch Propeller Electric Plant:	1	

	• 2 x Diesel Generator 900 kW, 450V AC, /60 Hz, 3 ph (diesel engine – Yanmar 8N21AL-SV, 1000 kW at 720 RPM); • 1 x Shaft Generator 1200 kW, 450V AC, /60 Hz, 3 ph; • 1 x Steam Turbine Driven Generator 1200 kW, 450V AC, /60 Hz, 3 ph; • Emergency Diesel Generator 200 kW, 450 V AC, /60 Hz. Modeled ship systems: • Bridge Control Console; • Engine Control Room; • Main Switch Board; • Control and Monitoring System; • Boiler Monitoring and Control System; • Diagnostics; • Schematic diagrams of modeled systems; • Steering Gear Room; • Engine Room Deck 1; • Engine Room Deck 2; • Engine Room Deck 3; • Engine Room Deck 4; • Fire Fighting Station; • Emergency Generator Room; • Cargo Control Room.		
5.2	INSTRUCTOR STATION Basic functions • Exercise control (starting/changing/stopping) • Freezing the situation (pause) • Monitoring of current operation parameters (data monitor) • Monitoring of current alarm system state (actual alarm list) • Logging the alarm's sequence (alarm log) • Logging the sequence of trainees' actions (event log) • Printing of exercise current state (all parameters and alarms with values) • Instructor extension task. Extends the main display of the Instructor application. Can run on a separate computer and on a separate monitor. Contains Instructor desktop tabs for monitoring selected information windows (parameters, faults, alarms, etc.). On-line control of Trainees • Main display for control of the class operation • Run several compatible models on one Bridge • Group Bridges for joint operation of compatible models • Record the situation (for debriefing) • Several Instructors can work simultaneously with the class, each instructor supervising his own group of Bridges • Ability to enable or disable hints on trainee workplace. Exercise Editor • Correcting start situation parameters and creation of new start situation • Setting and changing the environment conditions • Changing of alarm parameter limits • Briefing on Trainee workplace facility – trainee can monitor instructor's activity "Voice comment" function – in Exercise Editor mode, Instructor can, along with	1	

	savingthe exercise fulfillment process onto the hard disk (Log File), turn on the recording of own voice comments. In Debriefing mode, playback of recording (Log File) will be associated with the Instructor comments' record • Running several compatible models on one Instructor workplace • Recording the situation (for debriefing) Debriefing facility • Loading and viewing of recorded logs • Full range of possibilities at viewing time (positioning in time, acceleration of playback) • Event scale, which allows positioning into specific operation • Debriefing facility – trainee can monitor assigned logs on his workplace		
5.3	STUDENT STATION – TRAINEE CONSOLE Trainee Console Content Bridge Control Console (BCC) Simulator's pages with Bridge console panels for monitoring and remote control from Bridge Bridge Console - Section "A": • Nav. Control panel; • Steering Gear panel; • Fire Fighting panel. Bridge Console - Section "B": • Telegraph Unit; • Main Engine Remote Control panel; • Main Engine gauges; • Dead Man system panel; • Alarm Panel. Bridge Console - Section "C": • Fire Alarm panel; • General Alarm panel; • EMCY Stop panel (in case of Fire Alarm). Inert Gas Generator Monitor Panel Bridge Local Fire Fighting repeat panel Engine Control Room (ECR) Simulator's pages with ECR console panels for remote control from ECR ECR Console - Section "A": • Dead Man Main panel; • Steering Gear panel; • Fire Alarm Repeater panel; • Boiler 1 and 2 panel; • COPT and WBPT gauges; • El. Power lamps panel. ECR Console - Section "B": • Rudder indicator; • ME gauges; • ME Oil Mist Detection Control panel; • ME FO Viscosity Controller; • Machinery Run indicators panel. ECR Console - Section "C"- top: • ME Gauges; • ME Control panel; • ME Safety system panel;	10	

	• ME Governor Control Unit. ECR Console - Section "C"-bottom: • ME Control Position changeover switch; • Machine Telegraph receiver; • ME Maneuvering Handle; • ER Alarm Acknowledge Pushbutton ; • Alpha Lubricator panel; • ME Indicator panel Inert Gas Generator ECR Monitor panel Main Switch Board (MSB) Simulator's pages with sections of Main Switch Board, located in ECR Electric Power Plant Main Circuit Diagram simulator's interactive diagram MSB-Generator 1 section and Generator 2 section: • Gauges; • Indicators; • Gen. Controller; • Gen. Automatic Circuit Breaker (ACB) MSB-Shaft Generator section: • Gauges (A, V, Cos φ); • Indicators; • Gen. Controller; • Gen. Automatic Circuit Breaker (ACB). MSB Turbo Generator section: • Gauges (A, V, Cos φ); • Indicators; • Gen. Controller; • Gen. Automatic Circuit Breaker (ACB). MSB Bus Tie Section MSB Synchronizing Section: • Generators G1, G2, TG and SG Indicators; • Indicators; • Generators Controls; • Generators ACB Control switch (Open-Close); • Alarm panel; • Power meters; • V meters; • Hz meters; • Synchroscope; • El. Power Plant control mode changeover switch; • Emergency Switch Board ACB. Group Starter Panel No 1/1 – Set of El. Starters for different el. consumers. Group Starter Panel No 1/2 – Set of El. Starters for different el. consumers. Group Starter Panel No 2/1 – Set of El. Starters for different el. consumers. Group Starter Panel No 2/2 – Set of El. Starters for different el. consumers. 440 V AC Feeder Panels No 1 and No 2 – Set of El. Switches and Earth test panel. 220 V AC Feeder Panel –		

	Set of El. Switches, Ammeter, Voltmeter and Earth test panel. Control and Monitoring System (CMS) Simulator's pages with screens of PC-based Ship Control, Monitoring and Alarm system Main Screen with Main Menu ME Overview: • ME parameters; • ME Exh. Gas Temp. indicators; • ME Scav. Air Temp. indicators; • ME Jacket CFW Temp. indicators • ME Safety system indicators and Alarms. Generator Engines Overview: • Gen. Engines 1, 2 Safety system indicators and Alarms; • Gen. Engines 1, 2 parameters; • Turbo Generator parameters and indicators. Fuel Oil Service system for ME and Gen. Engines: • System diagram; • Machinery state indicators; • Valve state indicators; • FO Viscosity indicator. Fuel Oil Filling & Transfer system: • System diagram; • FO Tanks for different type of Fuel with level and temperature indicators; • Pump state indicators; • Valve state indicators. Fuel Oil Purifying system: • System diagram; • FO Storage, Settling and Service tanks for different type of fuel with tank level and temperature indicators; • Valve state indicators; • FO HFO Purifier No 1 and No 2 state indicators. Main Engine Service Lube Oil system: • System diagram; • System Parameter indicators; • Pump state indicators; • Valve state indicators; • Alarms. Lube Oil Storage and Transfer system: • System diagram; • LO Transfer pump; • LO Purifiers Feed pumps 1, 2; • Valve state indicators; • LO Purifier No 1 and No 2 state indicator; • Gen. Engines No 1, No 2 LO Inlet parameters (pressure and temperature); • Alarms. Low Temperature (LT) Cooling Fresh Water system: • System diagram; • LT CFW Pumps; • Valve state indicators; • Alarms. HT Cooling system • System diagram;		

	• ME Jacket CFW Pumps; • ME Cyl. CFW Temp. indicators; • Valve state indicators; Sea Water Cooling system: • System diagram; • Pumps state indicators; • Alarms. Exhaust Gas system • System diagram; • Exh. Gas Temp. indicators; • ME Exh. Gas Temp. indicators and deviation; • GE 1, 2 Exh. Gas Temp. indicators and deviation; • Alarms. Bilge and Fire Service system: • System diagrams; • Pumps; • Valves state indication; • Oily Water separator state indicator and Alarms; • Alarms. Compressed Air system: • System diagram; • Pressure indicators; • Air Compressors; • Valves state indicators; • Alarms. Aux. Boilers 1, 2 FW system: • System diagram; • Pumps; • Aux. Boilers 1,2 state indicator; • Exh. Gas Economizer; • Valves state indicators; • Alarms. Electric Plant: • Power Bus diagram; • ACB state indicators; • Generators parameters indicators; • Alarms. Alarms: • Alarm summary; • Alarm history. Events and Trends • Event list; • Trends. Boiler Monitoring and Control System (BMCS) Simulator's pages with screens of PC-based Boilers Alarm, Monitoring and Control system Burner Overview page: • System diagram; • Boiler 1, 2 indicators; • Pumps; • Controls; • Parameters;		

- Alarms.

Feed Water Overview page:
- System diagram;
- System Parameters;
- Alarms.

Steam Overview page:
- System diagram;
- Parameters indicators;
- Alarms.

Pump Overview page:
- Steam Plant Pumps controls (by using of sub-windows)
- Pump modes, state indicators.

Event List page
Alarm List page

Diagnostic System (Diag)
Simulator's pages for simulation of diagnostic procedures: recording and analysis of engine combustion; monitoring of Exhaust Gas emissions

Analyzing:
- Hand Unit for recording of pressure in each engine cylinder (Indicator Diagram) – step by step for ME, GE 1 and GE 2;
- Data transfer to main unit for analyzing.

Comparison:
- Stationary device;
- Simultaneous analyzing and comparison of recorded indicator diagrams of different engine cylinders;
- "P-φ" type Indicator diagram;
- "P-V" type Indicator diagram.

Cylinder Combustion Process page
The page has been designed to allow students to observe the effects of various combustion faults. A student is able now to affect the combustion process by making online adjustments or introducing faults directly from the student screen.

The reactions for all adjustments or introduced faults will be presented on the Indicator Diagram in "on-line mode".
Monitoring of the Cylinder Indicator Diagram in real time mode is available after selection of engine cylinder number and pushing of "CID" pushbutton

Exhaust Gas Emission Monitoring of:
- -NOx ppm
- - CO ppm
- - Sox ppm
- - CO2 %
- - C mg/m3
- for ME and GE 1 and GE 2.

System Diagrams (SYS)
Simulator's pages for simulation of local manual monitoring and control from Engine Room

Main Engine Maneuvering diagram –

	Set of diagrams for displaying various conditions of system – ME Stop, ME Start, Ahead, Reverse, and Astern. HT Cooling system: • System diagram; • System's Control facilities; • Indication of system parameters. Sea Water Cooling system: • System diagram; • System's Control facilities; • Indication of system parameters. LT Cooling system: • System diagram; • System's Control facilities; • Indication of system parameters. GE Cooling system: • System diagram; • System's Control facilities; • Indication of system parameters. Fuel Oil Filling and Transfer system: • System diagram (Low Sulfur FO included); • System's Control facilities; • Indication of system parameters. Fuel Oil Purifying system: • System diagram; • System's Control facilities; • Indication of system parameters. Fuel Oil Service system for ME and GEs: • System diagram; • System's Control facilities; • Indication of system parameters. Fuel Oil Service system for Incinerator and EMCY DG: • System diagram; • System's Control facilities; • Indication of system parameters. Fuel Oil system for Aux. Boilers 1, 2: • System diagram; • System's Control facilities; • Indication of system parameters. Lube Oil Transfer and Purifying system: • System diagram; • System's Control facilities; • Indication of system parameters. Lube Oil ME Service system: • System diagram; • System's Control facilities; • Indication of system parameters. Lube Oil Stern Tube system: • System diagram; • System's Control facilities; • Indication of system parameters. Lube Oil Steam Turbine system: • System diagram; • System's Control facilities; • Indication of system parameters.		

	Aux. Boilers Feed Water & Condensate system: • System diagram; • System's Control facilities; • Indication of system parameters. Steam Turbines Service system: • System diagram; • System's Control facilities; • Indication of system parameters. Compressed Air system: • System diagram; • System's Control facilities; • Indication of system parameters. Fresh Water Generator system: • System diagram; • System's Control facilities; • Indication of system parameters. Ballast system: • System diagram; • System's Control facilities; • Indication of system parameters. Bilge and Fire General Service system: • System diagram; • System's Control facilities; • Indication of system parameters. Steering Gear system: • System diagram; • System's Control facilities; • Indication of system parameters. Sewage Treatment system: • System diagram; • System's Control facilities; • Indication of system parameters. Fresh Water Service system: • System diagram; • System's Control facilities; • Indication of system parameters. Air Conditioning system: • System diagram; • System's Control facilities; • Indication of system parameters. Provision Cooling system: • System diagram; • System's Control facilities; • Indication of system parameters. Local Fire & Foam system: • System diagram; • System's Control facilities; • Indication of system parameters. CO2 Fire system: • System diagram; • System's Control facilities; • Indication of system parameters. Steering Gear Room (SG)		

	Simulator's pages with local control panels for machinery and units, located in compartment 3-D Visualization Clicking a mechanism/unit opens the mechanism/unit LOP Steering Gear LOP Emergency Fire Pump motor starter Deck Machinery HPU Aft. LOP Dead Man Reset pushbutton Engine Room 1 (ER1) Simulator's pages with local control panels for machinery and units, located in the named surface 3-D Visualization Clicking a mechanism/unit opens the mechanism/unit LOP Main Engine LOP; • ME parameters Gauge board; • Engine Side Telegraph & Indicator box. ME Turning Gear starter Oily Water Separator LOP Anti-Fouling system (MGPS) panel Group El. Starter panel No 7 Group El. Starter panel No 8 Group Pushbutton Panel No 1 (GPBP-1) Group Pushbutton Panel No 2 (GPBP-2) Group Pushbutton Panel No 3 (GPBP -3); ME LO Temperature controller Group Pushbutton Panel No 9 (GPBP -9) Exhaust Gas Scrubber Control Panel The system for reduction of Exhaust Gas emissions. Dead Man Reset pushbutton Engine Room 2 (ER2) Simulator's pages with local control panels for machinery and units, located in the named surface 3-D Visualization Clicking a mechanism/unit opens the mechanism/unit LOP Ballast Pump No 1 LOP • ME Alpha Lubricator Booster Pump 1 Starter; • ME Alpha Lubricator Booster Pump 2 Starter Cargo Oil Pump Turbine 1 (COPT 1) LOP Cargo Oil Pump Turbine 2 (COPT 2) LOP Cargo Oil Pump Turbine 3 (COPT 3) LOP Water Ballast Pump Turbine (WBPT) LOP • ME Local FF system panel; • GE 1 & GE 2 Local FF system panel; • TG Local FF system panel; • HFO Purifiers Local FF system panel 440V Power Distribution Board 2 Group Pushbutton Panel 5 (GPBP -5) • Group Pushbutton Panel No 8 (GPBP-8);		

	• LT CFW Temp. Controller Dead Man Reset pushbutton Engine Room 3 (ER3) Simulator's pages with local control panels for machinery and units, located in the named surface 3-D Visualization Clicking a mechanism/unit opens the mechanism/unit LOP • GE 1 LOP; • GE 2 LOP • GE 1 Control panel; • GE 2 Control panel Steam Turbo Generator Control panel • Aux. Blower 1 Starter; • Aux. Blower 2 Starter • Fuel Oil Purifier 1 LOP; • Fuel Oil Purifier 2 LOP • Lube Oil Purifier 1 LOP; • Lube Oil Purifier 2 LOP Fresh Water Generator panel ER Fans 1, 2, 3 and 4 Pushbutton box Local FF Pump Starter FW Service System Pumps Pushbutton box FW Calorifer Control panel Group Starter Panel 4 (GSP 4) Group Starter Panel 6 (GSP 6) • Group Pushbutton Panel 4 (GPBP 4); • ME HT CFW Temp. Controller; • GE HT CFW Temp. Controller Group Pushbutton Panel 6 (GPBP 6) Dead Man System Start Panel Dead Man Reset pushbutton Engine Room 4 (ER4) Simulator's pages with local control panels for machinery and units, located in the named surface 3-D Visualization Clicking a mechanism/unit opens the mechanism/unit LOP Air Conditioning System Control panel Air Conditioning System LOP Main Air Compressor LOP Aux. Boilers 1, 2 Power panel Aux. Boiler 1 Control panel Aux. Boiler 2 Control panel Aux. Boilers MGO Pump 1, 2 Starter • Incinerator LOP;		

	• Waste Oil Tank Control panel Soot Blower panel Sewage Treatment Plant Control panel Provision Cooling Plant LOP • Aux. Boilers Local FF System panel; • Incinerator Local FF System panel Valve Remote Control system HPU LOP Group Starter Panel 3 (GSP 3) Group Starter Panel 5 (GSP 5) Group Starter Panel 9 (GSP 9) 440V Power Distribution Board 3 Group Pushbutton Panel 7 (GPBP 7) Dead Man Reset pushbutton Fire Fighting Station (FFS) Simulator pages with local remote control panels for Fire Fighting systems FF Emergency Stop Switch Box EMCY Shut Off Valves Control panel Local FF System Main Control panel High Expansion Foam FF System Main Control panel Foam Pumps Starters Emergency Generator Room (EmG) Simulator's pages with sections of Emergency Switch Board and Emergency Generator Local Operating Post • EMCY Generator Engine LOP; • EMCY Generator Battery Charger panel. • Emergency Switch Board (ESB) – EMCY Generator Section; • ESB – Shore Connection Section (Panel). • ESB 440V AC Feeder Section (Panel); • ESB 220V AC Feeder Section (Panel); • ESB EMCY Group Starter Panel. • ESB Battery Charging and Discharging Board Cargo Control Room (CCR) Simulator's pages with local control panels for some machinery and systems, located in the named compartment Ballast System Control panel Ballast Pumps Control panel Cargo Pumps Control panel Inert Gas (IG) System Control panel IG Topping Up Generator Control panel HPU Remote Controller panel Fire Visualization Feature		
6	Installation of simulator software and training		

	✓ Installation of simulator software on PC equipment, setup of simulator, testing of simulator operation and handling over to end user ✓ Training of instructors for the use of simulator		
7	Ship Digital Portable Inclinometer	3	
8	Ultrasonic Thicknees Gauge Application in maritime field (control of corrosion in ship plate, bulkhead, ship structure, offshore installations, fuel tanks, oil gas and fuel pipeline etc) Velocity 2000 m/s and 7000 m/s Range of thickens gauge 1 -250 mm (for steel) Accuracy ± 0.1 mm	1	
9	Ship Digital Inclinometer According IMO MSC.363 (92) (Adopted on 14 June 2013) requirements	3	
10	Digital Thermo-Hydrometer	3	
11	Digital Thermo-Hygrometer	3	
12	IMO illuminous labels (fire fighting, solas, deck, machine)	25	
13	Marine fuels and lubricants test equipment		
13.1	Set of oil testing devices containing a suite of core electronic QC tests lubricants and residual fuel oils. Of rugged design and suitable for long term use in harsh environments, all equipment is simple to use and ideal for operation by students and other non-lab-trained persons. The SET must contains as minimum: • DIGI Combined Water in Oil/BN cell 0-20%/ 5-100 BN • Test for qualitative analysis • Viscosity meter • Density Meter - Complete with Case and Accessories • Compatibility Tester - Complete with Case and Accessories • Oil Analysis Viscometer (Heated) DIGI Combined Water in Oil/BN cell The DIGI Water in Oil Test Kit must provide state of the art, digital analysis and must gives fast, accurate results for easy monitoring of trends. The DIGI Water in Oil Test Kit must contains the test cell together with all necessary reagents and equipment for an easy to use, economical test. Measuring range: 0-20% / 5-100 BN Viscosity meter Range: go/no go Application: Lubricating oils, viscous hydraulics No. of Tests: Unlimited Test Time: 1 minute Must gives a simple go/no go result. Typically it might detect 5-10% distillate fuel dilution of an SAE 30 to 40 engine oil as well as increases in viscosity due to oil contamination. Density Meter. Calculations: Density at 15°C in vacuo, Centipoise to centiStokes Calculated Carbon Aromaticity Index (CCAI) The Density Meter must be supplied complete with three hydrometers and consumables. Density must be calculated electronically, giving fast, accurate results and estimating the combustion performance (CCAI), and correct viscosity in cP to cSt. Compatibility Tester The Compatibility Tester must be supplied complete with test papers and consumables.	1	

	The compatibility tester must be quickly to identify potential fuel stability problems. It must be also rapidly to determine if a fuel is compatible with existing fuel stocks. Heated Viscometer Calculated Viscosity at 40 °C, 50°Cand 100 °C, Calculated Carbon Aromaticity Index (CCAI). Display: 8 Digit LED Keypad: Membrane type with tactileButtons Power: 110 to 240 AC 50/60 Hz Test Kit must contains Heated Viscometer, powersupply and all consumables in a portable robustmetal case. It must gives: Monitoring viscosity at an early warning for a range of common problems. Highly accurate results with two readings are available at 40°C, 50°C or 100°C. Test an even greater range of oils, by changing the viscosity index or density. Estimate the combustion performance (CCAI) of fuel oil. Heavy duty, robust equipment - ideal for long term use with rapid results.		
13.3	Water / TBN Reagent Pack	5	
13.4	TAN Reagent Pack 0-6 (50)	5	
13.5	750ml Sample Bottle	40	