Original

DEMOCRATIC SOCIALIST REPUPLIC OF SRI LANKA

MINISTRY OF EDUCATION

UNIVERSITY OF RUHUNA

ADDENDUM 1

Supply, Delivery, Installation, Commissioning, Testing and Maintenance of Laboratory Equipment, Plant & Machinery, Computer Software/Hardware & Accessories, Office Equipment & Furniture & Others for University of Ruhuna

RUH/SUP/MENA/NCB/2023/01

Package No. 01: Supply, Delivery, Installation, Commissioning, Testing and Maintenance of Full Mission Simulator with necessary Software for DMENA, Faculty of Engineering, University of Ruhuna.

This Amendment shall be considered part of the bid documents for the Supply, Delivery, Installation, Commissioning, Testing and Maintenance of Laboratory Equipment, Plant & Machinery, Computer Software/Hardware & Accessories, Office Equipment & Furniture & Others for the DMENA, Faculty of Engineering, University of Ruhuna and shall be incorporated integrally therewith. Where provisions of the following supplementary data differ from those of the original bid documents, this Amendment shall govern and take precedence. BIDDERS MUST SIGN THE AMENDMENT AND SUBMIT IT WITH THEIR BIDS.

Except as described below, the original bid document remains unchanged. The bid documents are modified and/or clarified, as follows;

Section II
Bidding Data Sheet
(BDS)

The dates, additional requirements & quantity in ITB 11.1(e), 19.1, 20.2, 23.1 & ITB 26.1 has been changed as follows and other details remains unchanged. (Changes are highlighted)

<table>
<tr><th>ITB Clause Reference</th><th>A. General</th></tr>
<tr><td>ITB 11.1 (e)</td><td>The Bidder shall submit the following additional documents:
A complete company profile of the bidder including, but not limited to, the following:
• Copy of Business Registration issued by Government Authority; Company Registrar/Provincial Registrar of Business in relevant field.
• Copies of audited financial accounts. (At least three years)
• List of major clients who used the products for last three years with contact numbers or recommendations letters.
• Copy of the VAT Registration or VAT exemption letter issued by Inland Revenue Department.
• Manufacturer’s authorization letters (if applicable).
• Documentary evidence for 3-10 years experience in the relevant industry in Sri Lanka. (As per requirement of Technical Specification)
• The bidders shall be register themselves with registrar of public contracts, Sri Lanka, in term of the Public Contracts Act No. 03 of 1987. The original registration certificate shall be submitted with the bid , If relevant.</td></tr>
<tr><td>ITB 19.1</td><td>The bid shall be validity until: 90 days from the bid opening date</td></tr>
<tr><td>ITB 20.2</td><td>The amount of the Bid Security shall be as follows:

<u>Package No. 01: Supply, Delivery, Commissioning, Testing and Maintenance of Full Mission Simulator with necessary Software</u>

<table>
<tr><th>Item No</th><th>Goods/Descriptions</th><th>Qty</th><th>Bid Security (Rs.)</th></tr>
<tr><td>1.1</td><td>Full Mission Engine Room Simulator (A Complete Package)</td><td>01</td><td>1,665,000.00</td></tr>
<tr><td>1.2</td><td>Engine Desktop Simulator System Software</td><td>26</td><td>546,000.00</td></tr>
</table>
Beneficiary: Vice Chancellor, University of Ruhuna
The validity period of the Bid Security shall be until: 30 days beyond the date of bid validity period.</td></tr>
<tr><td>ITB 23.1</td><td>For bid submission purposes, the Purchaser’s address is:

Attention: The Chairman, Ministry Procurement Committee, Ministry of Education, Higher Education Division, No 18, Ward Place, Colombo 07
Tender Box – Director, Infrastructure Development Office
The deadline for the submission of bids is:
Date: 29.08.2023
Time: 11.00 hours</td></tr>
</table>

ITB 26.1	The bid opening shall take place at: Address: **The Chairman, Ministry Procurement Committee, Ministry of Education, Higher Education Division, No 18, Ward Place, Colombo 07** **Tender Box – Director, Infrastructure Development Office** Date: **29.08.2023** Time: **11.00 hours**

Section IV
Bidding Forms
Bid Submission Form

[The Bidder shall fill in this Form in accordance with the instructions indicated no alterations to its format shall be permitted and no substitutions shall be accepted.]

Date:

No: **RUH/SUP/MENA/NCB/2023/01**
Package No. 01 - Supply, Delivery, Commissioning, Testing and Maintenance of Full Mission Simulator with necessary Software
To: **The Chairman, Ministry Procurement Committee**

We, the undersigned, declare that:

a) We have examined and have no reservations to the Bidding Documents, including Addenda No.:
b) We offer to supply in conformity with the Bidding Documents and in accordance with the Delivery Schedules specified in the Schedule of Requirements the following Goods and Related Service to the University of Ruhuna.

	Item No	Goods/Descriptions	Qty
Package No. 01: Full Mission Simulator with necessary Software	1.1	Full Mission Engine Room Simulator (A Complete Package)	01
	1.2	Engine Desktop Simulator System Software	26

(Delete the packages which are not offered if applicable)

c) The total price of our Bid without VAT, including any discounts offered is: ……. ……..[*Include the total bid price in words and figures for all package (lots) offered*]

d) The total price of our Bid including VAT, and any discounts offered is: ……. ……..[*Include the total bid price in words and figures for all package (lots) offered*]

e) Our bid shall be valid for the period of time specified in ITB sub-Clause 19.1, form the date fixed for the bid submission deadline in accordance with ITB Sub-Clause 23.1, and it shall remain biding upon us and may be accepted at any time before the expiration of that period;

f) If our bid is accepted, we commit to obtain a performance security in accordance with ITB Clause 43 and CC Clause 17 for the due performance of the Contract;

g) We have no conflict of interest in accordance with ITB Sub-Clause 4.3;

h) Our firm, its affiliates or subsidiaries- including any subcontractors or suppliers for any part of the contract-has not been declared blacklisted by the National Procurement Agency;

i) We understand that bid, together with your written acceptance thereof include in your notification of award, shall constitute a binding contract between us, until a formal contract is prepared and executed.

j) We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive.

Signed:…… (*Insert signature of person where name and capacity are shown)*

In the capacity of ……..(*Insert legal capacity of person signing the Bid Submission Form)*

Name:…….....(*Insert complete name of person signing the Bid Submission Form)*

Duly authorized to sign the bid for and on behalf of :……*(Insert complete name of the Bidder)*

Rubber stamp

Dated on …… day of ……. (*Insert date of Signature*)

Price Schedule

(The Bidder shall fill in the price schedule in accordance with the instructions indicated The list of line items in column 1 of the Price Schedules shall coincide with the List of Goods and Related Services specified by the Purchaser in the Schedule of Requirements.)

Note: 1. Unless otherwise allowed under ITB Clause 15, the bidders are required to quote the prices under 'A' columns;

2. Bidders may quote prices under 'B' columns only if the ITB Clause 15 provides provisions to bid in foreign currencies for the item.

Biding Item No	**Description of the Goods**	**(1) Qty and Unit**	**(A) Goods and related Services offered within Sri Lanka (in SLR)**							**(B) Goods to be imported and supply**					
			(2) Unit Price (inclusive of duties, sales and other taxes) Excluding VAT	**(3) Price per Item** (1x2)	**(4) Inland Transportation, insurance and other related services to deliver the goods to their final destination if not included under (2)**	**(5) Total Price** Excluding VAT (3+4)	**(6) Discounted Total Price** (if any) Excluding VAT	**(7) VAT**	**(8) Total Price** Including VAT (5 or 6+7)	**(9) Unit Price** (foreign cost)		**(10) Foreign Cost per Item** (1x9)		**(11) All related costs to deliver to their final destination, customs duties, sales and other taxes, transportation, insurance** (Excluding VAT) **(Rs.)**	**(12) VAT (Rs.)**
										Currency	Amount	Currency	Amount		
1.1	Full Mission Engine Room Simulator (A Complete Package)	01													
1.2	Engine Desktop Simulator System Software	26													

Total Price without VAT (in words) ……...…...

……... **……**

Signature and seal of the Bidder **Date**

Section V
Schedule of Requirements

1. List of Goods and Delivery Schedule

[The Purchaser shall fill in this table, with the exception of the column "Bidder's offered Delivery date" to be filled by the Bidder]

Biding Item No.	Description of Goods	Qty.	Final Destination as specified in BDS	Delivery Date		
				Earliest Delivery Date	Latest Delivery Date	Bidder's offered Delivery Date
1.1	Full Mission Engine Room Simulator (A Complete Package)	01	Faculty of Engineering, Hapugala, Galle	**4 weeks**	**35 weeks**	
1.2	Engine Desktop Simulator System Software	26	Faculty of Engineering, Hapugala, Galle	**4 weeks**	**35 weeks**	

..... ……..……

Signature of the bidder with official rubber stamp Date

2. Technical Specifications and Bidder's Response

(No alternative design shall be considered. The bidder shall follow the technical specifications given in relevant drawings and other requirements given in the bidding document.)

2.1 Technical Specifications

RUH/SUP/MENA/NCB/2023/01

Item No	Goods/Descriptions	Specification
1.1	Full Mission Engine Room Simulator (A Complete Package)	**Appendix 1.1**
1.2	Engine Desktop Simulator System Software	**Appendix 1.2**

2.2 Bidder's Response

RUH/SUP/MENA/NCB/2023/01

Item No	Description of Goods	Qty	Specifications	Bidder's Response		Remarks
				Yes	No	
1.1	Full Mission Engine Room Simulator (A Complete Package)	01	**Appendix 1.1**			
1.2	Engine Desktop Simulator System Software	26	**Appendix 1.2**			

Appendix 1.1

Specification: **Full Mission Engine Room Simulator including instructor station (A Complete package) (01 Nos)**

Item No.	Specification/s	Requirements	Conformity		If No, Bidder's Response
			Yes	No	
General Specifications					
1	**Comply with International Standard**	Comply with International Convention on Standard of Training, Certification and Watchkeeping (STCW) 1978 for seafarers, adopted by International Maritime Organization to set minimum qualification standard for masters, officers and engineers on seagoing Merchant ships			
2	**Innovative Capabilities in Education, Training and Assessment**	With the changing technologies in maritime applications this should provide a Simulator-based training on the latest Merchant ship engines. -This permits flexible and systematic scheduling of instructional assignments as desired by the instructional staff or as in the training syllabus. -This allows hands-on training to be conducted by giving a feeling that in a realistic marine environment and operation of a vessel without exposing it to the risk. - Students are allowed to repeat a risky operations several times if needed. An instructor intervention is possible at all time. -This allows to train and assess following tasks of engineer officers at the operational level: (a) Engine room equipment familiarization (b) System layout and flow diagrams (c)Operations of generators and control systems (d) Operations and maneuverings of main engine and auxiliary machinery and all associated systems (e) Routine procedures for preparing the engine room system. (f) Routine checking and preparing of			

		engine plant system in port such as cold standby (g) Operations of all pumping and its control systems (h) Maintaining a safe engineering watch (i) Maintaining the seaworthiness of the ship (j) Alarm and safety systems -This allows to train and assess following tasks of engineer officers at the management level: (a) Planning the operations. (b) Vessel resource management (c) Overall actions and procedures for engine room processes and management (d) Locating and finding of system conditions such as single fault. (e) Routine remedial actions and procedures. (f) *Fine*-tuning of process in main and auxiliary system. (g) Optimization of the whole plant and setting factor affecting ship's economics and safety (h) Emission control and fuel economy management			
3	**Documentation**	(a) All necessary documents related to the hardware and software delivered for this package should be specified. They should contain; -Technical Specifications of the items provided for the package -Installation instruction manuals -Assembly documentation -Functional description -Operational instructions manuals or catalogues -Service and Maintenance instruction manuals -Product quality certificates -Laboratory practical classes manuals -Training manuals (b) For evaluation purposes, it will be required to provide a documentary video/s of the complete system, elaborating key features offered (both software and hardware). The video/s should be in the MP4 format included in a CD/DVD. Clearly name the video file/s for easy access.			
4	**Arrangement of a pre-**	A pre-inspection visit to the OEM facility to			

	inspection visit to OEM facility to verify the package meets the required specifications and to observe the running conditions before the shipment, while providing a pre-training on the operation of the system	be arranged by the supplier for at least four (4) nominated members from the client side, in order to verify the package of items are tallying with the specifications and are working as expected. Therefore, it will be required to demonstrate the system in the OEM facility prior to packaging and shipment for verification, inspection and pre-training purposes.			
5	**Packing, Shipment and delivery**	All instruments are high tech electronic items and outmost attention should be paid by the bidder or manufacturer in packaging, shipping, delivering and unloading the items.			
6	**Installation, Commissioning and Testing**	Installation should be undertaken by the competent technical person from the manufacturer side and should be completed as per the given details by the manufacturer. Installations, commissioning and testing should also be undertaken by the manufacturer's side and should be completed as per the manufacturer's guidelines in front of the persons nominated by the client side. Accordingly, for security purposes no any third party will be accepted for this purpose and in such case, will not be permitted to enter the premises.			
7	**Training on operating and handling of engine simulators and conducting laboratory classes**	After installation and commissioning of the of the system at the local premises of the client, comprehensive hands-on training should be conducted for the designated staff members of the client side. The training should cover following objectives; -Starting and closing procedures of the full mission simulator -Instructor physical and monitoring facilities -Facilities of Engine Room Models -Changing engine room models -Engine Room console operations and monitoring systems -Practicing engine room simulator operations -Fault conditions including evaluation of students -Plant performance analysis -Planning and preparing exercises -Routine maintenance -Fault finding procedures -All other service facilities.			

<table>
<tr><td>8</td><td>Project Management</td><td>After the contract is signed, the manufacturer should appoint a project manager who shall function as the focal point until installation, pre-commissioning, commissioning, testing and handover of the complete system. All administration and essential communications with the university authority shall be the responsibility of the Project Manager</td><td></td><td></td><td></td></tr>
<tr><td>9</td><td>Quality Assurance and Control</td><td>After installation of the complete system, the project manager should submit a quality assurance certificate stating due compliance with the stipulated standards to the university authority.</td><td></td><td></td><td></td></tr>
<tr><td>10</td><td>Warranty for the hardware items</td><td>It is required to provide manufacturer’s Warranty for hardware parts 03 years or more effective from the date of handover of the system to the University Authority.</td><td></td><td></td><td></td></tr>
<tr><td>11</td><td>Software updates</td><td>For all software installed in the simulator systems, lifetime updates are expected, if not please specify.</td><td></td><td></td><td></td></tr>
<tr><td>12</td><td>After Sale Services</td><td>(a) After installation of the simulator systems, the supplier should ensure continuous provision of technical assistance with regard to hardware and software.

(b) Annual maintenance and service cost (after the warranty period)<table><tr><td>Duration after warranty period</td><td>Annual Service Agreement Cost without taxes (Rs.)</td></tr><tr><td>1</td><td>First year (at the end of year l)</td></tr><tr><td>2</td><td>Second year (at the end of year 2)</td></tr><tr><td>3</td><td>Third year (at the end of year 3)</td></tr><tr><td>4</td><td>Fourth year (at the end of year 4)</td></tr><tr><td>5</td><td>Fifth year (at the end of year 5)</td></tr><tr><td></td><td>Total maintenance Agreement cost for five years</td></tr></table></td><td></td><td></td><td></td></tr>
<tr><td colspan="6">Engine Full Mission Simulator Software Models (03 Nos.)</td></tr>
<tr><td rowspan="7">13</td><td rowspan="7">Slow Speed Engine Model (01 No.)

Software licenses should be provided for dual fuel /LNG driven Engine model with electronically controlled system suitable for an oil tanker</td><td>Main propulsion engine of propulsion power 750 kW or more</td><td></td><td></td><td></td></tr>
<tr><td>Minimum 6 number of Piston Cylinders inline</td><td></td><td></td><td></td></tr>
<tr><td>2 Stroke</td><td></td><td></td><td></td></tr>
<tr><td>Speed range: 80 – 120 rpm</td><td></td><td></td><td></td></tr>
<tr><td>The engine room system should include:</td><td colspan="3"></td></tr>
<tr><td>-Integrated monitoring, automation and diagnostics systems simulation</td><td></td><td></td><td></td></tr>
<tr><td>-Freshwater generation system</td><td></td><td></td><td></td></tr>
</table>

		-Auxiliary power generators and management of such systems			
		-Comprehensive engine starting and stop systems.			
		- Comprehensive engine cooling system			
		-Comprehensive simulation of boiler systems			
		-Comprehensive lubricating oil management systems			
		-Stern tube thermal management systems			
		-Steering system			
		-Main engine control (onsite/remote) system			
		-Comprehensive simulation of main engine hydraulic systems			
		-Cylinder indicator diagrams			
		-Air ventilation system			
		-Refrigeration system			
		-Sewage treatment plant			
		-Incinerator plant			
		-Bilge wells & bilge separator system			
		-Ballast system			
		-Inert gas system			
		- Turbo charger Systems			
		-Ship loading system.			
		-Firefighting systems (automatic and manual).			
		-Other emergency and safety systems (please specify)			
		-Comprehensive emission control system			
		-Full walkthrough of the engine room			
		-Switchboards, distribution, and Panels for Electric Power and Lighting			
		-Comprehensive Safety Warning System			
		- Propulsion Control System			
		-Comprehensive electrical power system			
		-Bow Thruster			
		-Battery Charging System			
		-Other Additional features (please specify if any)			
14	**Medium Speed Engine Model (01 No.)**	Main propulsion engine of propulsion power 750 kW or more			

	Software licenses should be provided for dual fuel /LNG driven Engine model with electronically controlled system suitable for a **dry cargo Ship**	Minimum 6 number of Piston Cylinders inline			
		2 Stroke			
		Speed range: 300 – 1000 rpm			
		The engine room system should include:			
		-Integrated monitoring, automation and diagnostics systems simulation			
		-Freshwater generation system			
		-Auxiliary power generators and management of such systems			
		-Comprehensive engine starting and stop systems.			
		- Comprehensive engine cooling system			
		-Comprehensive simulation of boiler systems			
		-Comprehensive lubricating oil management systems			
		-Stern tube thermal management systems			
		-Steering system			
		-Main engine control (onsite/remote) system			
		-Comprehensive simulation of main engine hydraulic systems			
		-Cylinder indicator diagrams			
		-Air ventilation system			
		-Refrigeration system			
		-Sewage treatment plant			
		-Incinerator plant			
		-Bilge wells & bilge separator system			
		-Ballast system			
		-Inert gas system			
		- Turbo charger Systems			
		-Ship loading system.			
		-Firefighting systems (automatic and manual).			
		-Other emergency and safety systems (please specify)			
		-Comprehensive emission control system			
		-Full walkthrough of the engine room			
		-Switchboards, distribution, and Panels for Electric Power and Lighting			
		-Comprehensive Safety Warning System			
		- Propulsion Control System			
		-Comprehensive electrical power system			

		-Bow Thruster			
		-Battery Charging System			
		-Other Additional features (please specify if any)			
15	**High Speed Engine Model (01 No.)** Software licenses should be provided for dual fuel /LNG driven Engine model with electronically controlled system suitable for **a Container Carrier**	Main propulsion engine of propulsion power 750 kW or more			
		Minimum 6 number of Piston Cylinders inline			
		2 Stroke			
		Speed : above 1200 rpm			
		The engine room system should include:			
		-Integrated monitoring, automation and diagnostics systems simulation			
		-Freshwater generation system			
		-Auxiliary power generators and management of such systems			
		-Comprehensive engine starting and stop systems.			
		- Comprehensive engine cooling system			
		-Comprehensive simulation of boiler systems			
		-Comprehensive lubricating oil management systems			
		-Stern tube thermal management systems			
		-Steering system			
		-Main engine control (onsite/remote) system			
		-Comprehensive simulation of main engine hydraulic systems			
		-Cylinder indicator diagrams			
		-Air ventilation system			
		-Refrigeration system			
		-Sewage treatment plant			
		-Incinerator plant			
		-Bilge wells & bilge separator system			
		-Ballast system			
		-Inert gas system			
		- Turbo charger Systems			
		-Ship loading system.			
		-Firefighting systems (automatic and manual).			
		-Other emergency and safety systems			

		(please specify)			
		-Comprehensive emission control system			
		-Full walkthrough of the engine room			
		-Switchboards, distribution, and Panels for Electric Power and Lighting			
		-Comprehensive Safety Warning System			
		- Propulsion Control System			
		-Comprehensive electrical power system			
		-Bow Thruster			
		-Battery Charging System			
		-Other Additional features (please specify if any)			
Full Mission Instructor Station Software (02 Nos)					
16	Full Mission Instructor Software License	The instructor station facilitates the instructor to manipulate and monitor the learning activities done by students with the Full Mission Simulator			
		- Must be able to monitor and control the students in the classroom such as start, run, pause and set up groups for team training.			
		-Must be able to create an exercise structure that comprises initial conditions and scenario modules which, dependent on the type of exercise, may include triggers, electronic messaging to trainees, set actions and malfunctions, and assessment systems.			
		-The instructor must access the control configuration tool to configure the various student stations to fit the different exercises. This should include: level of information visible in the various system diagrams level of information that is possible to maybe accessed. System(s) to be accessible from multiple stations, Access level regarding alarm system, Access level regarding access to variable and malfunction pages			
		-An assessment system can display the users state (active and Inactive) and all overview of what is carried out			
		-Logic Block-Based editor is used to build triggers which again is used to activate messages, actions, malfunctions, and assessments. Building blocks are based on Boolean algebra (logic).			

		-Capable of coach messaging that shall be able to simulate as the master, engineer, or Instructor himself.			
		-Capable of editing the actions to be carried out, such as delay, ramping, and reset value criteria.			
		-Assessment System must be able to: Calculate the total score. Capable for positive and negative deductions. Capable to the type of error, critical or non-critical (must be achieved to pass) time used from fault appear to proper action is taken. Rate of score/penalty points, discrete or integrating. System can manipulate when to freeze/start/stop the assessment.			
		-must be able to create and print the assessment.			
		-must be able to start the recording the exercise system automatically.			
		-replays from any point in time for training or recording of unlimited lengths can be saved and stored for later use.			
		-speed of the simulation can be changed based on the exercise to ensure delivery.			
17	Instructor Station Simulator Engine Model Software and licenses should be provided for the model of **a slow speed engine** with dual fuel /LNG driven and electronically controlled system suitable for **an oil Tanker**	Main propulsion engine of propulsion power 750 kW or			
		more Minimum 6 number of Piston Cylinders inline			
		2 Stroke			
		Speed range: 80 – 120 rpm			
		Instructor Simulator Engine Model should include:			
		-Integrated monitoring, automation and diagnostics systems simulation			
		-Freshwater generation system			
		-Auxiliary power generators and management of such systems			
		-Comprehensive engine starting and stop systems.			
		- Comprehensive engine cooling system			
		-Comprehensive simulation of boiler systems			
		-Comprehensive lubricating oil management systems			
		-Stern tube thermal management systems			
		-Steering system			
		-Main engine control (onsite/remote) system			
		-Comprehensive simulation of main			

		engine hydraulic systems			
		-Cylinder indicator diagrams			
		-Air ventilation system			
		-Refrigeration system			
		-Sewage treatment plant			
		-Incinerator plant			
		-Bilge wells & bilge separator system			
		-Ballast system			
		-Inert gas system			
		- Turbo charger Systems			
		-Ship loading system.			
		-Firefighting systems (automatic and manual).			
		-Other emergency and safety systems (please specify)			
		-Comprehensive emission control system			
		-Full walkthrough of the engine room			
		-Switchboards, distribution, and Panels for Electric Power and Lighting			
		-Comprehensive Safety Warning System			
		- Propulsion Control System			
		-Comprehensive electrical power system			
		-Bow Thruster			
		-Battery Charging System			
		-Other Additional features (please specify if any)			
18	Instructor Station Simulator Engine Model Software and licenses should be provided for the model of **a medium speed engine** with dual fuel /LNG driven and electronically controlled system suitable for **a dry cargo- ship**	Main propulsion engine of propulsion power 750 kW or more			
		Minimum 6 number of Piston Cylinders inline			
		2 Stroke			
		Speed range: 300 – 1000 rpm			
		Instructor Simulator Engine Model should include:			
		-Integrated monitoring, automation and diagnostics systems simulation			
		-Freshwater generation system			
		-Auxiliary power generators and management of such systems			
		-Comprehensive engine starting and stop systems.			
		- Comprehensive engine cooling system			

		-Comprehensive simulation of boiler systems			
		-Comprehensive lubricating oil management systems			
		-Stern tube thermal management systems			
		-Steering system			
		-Main engine control (onsite/remote) system			
		-Comprehensive simulation of main engine hydraulic systems			
		-Cylinder indicator diagrams			
		-Air ventilation system			
		-Refrigeration system			
		-Sewage treatment plant			
		-Incinerator plant			
		-Bilge wells & bilge separator system			
		-Ballast system			
		-Inert gas system			
		- Turbo charger Systems			
		-Ship loading system.			
		-Firefighting systems (automatic and manual).			
		-Other emergency and safety systems (please specify)			
		-Comprehensive emission control system			
		-Full walkthrough of the engine room			
		-Switchboards, distribution, and Panels for Electric Power and Lighting			
		-Comprehensive Safety Warning System			
		- Propulsion Control System			
		-Comprehensive electrical power system			
		-Bow Thruster			
		-Battery Charging System			
		-Other Additional features (please specify if any)			
19	Instructor Station Simulator Engine Model Software and licenses should be provided for the model of **a high speed engine** with dual fuel	Main propulsion engine of propulsion power 750 kW or more			
		Minimum 6 number of Piston Cylinders inline			
		2 Stroke			
		Speed : above 1200 rpm			

	/LNG driven and electronically controlled system suitable for **a container carrier**	**Instructor Simulator Engine Model should include:**			
		-Integrated monitoring, automation and diagnostics systems simulation			
		-Freshwater generation system			
		-Auxiliary power generators and management of such systems			
		-Comprehensive engine starting and stop systems.			
		- Comprehensive engine cooling system			
		-Comprehensive simulation of boiler systems			
		-Comprehensive lubricating oil management systems			
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		-Inert gas system			
		- Turbo charger Systems			
		-Ship loading system.			
		-Firefighting systems (automatic and manual).			
		-Other emergency and safety systems (please specify)			
		-Comprehensive emission control system			
		-Full walkthrough of the engine room			
		-Switchboards, distribution, and Panels for Electric Power and Lighting			
		-Comprehensive Safety Warning System			
		- Propulsion Control System			
		-Comprehensive electrical power system			
		-Bow Thruster			
		-Battery Charging System			
		-Other Additional features (please specify if any)			

Full Mission Engine Control Room Equipment					
20	**Engine Control Room Equipment**	**ECR1 – Pump and Compressors with Power Management Console (1 No)**			
		Instrument Console (1 No) Minimum requirements: - Shape and size to be compatible to an actual console in a ship (please specify the size (L*W*H) and minimum W to be 600 mm) - Console to be Marine Grade and suitable for use onboard ship (please specify the material and thickness of plate used for the console)			
		- Product features (please specify)			
		Computer for the Console (1 No.) Minimum requirements; -Intel(R) Core(TM) i7-12th gen Processor, Intel® Chipset -RAM ; 16GB in 1 DRAM module expandable to 32 GB -1 TB NVM.e SSD -Dedicated Current Generation Graphics card with 8GB VRAM (NVIDIA 37xx Generation or better) OR (AMD 7xxx Generation or better) -DisplayPort -1 Gbps GigbitE Ethernet port Must be compatible with the engine control room equipment of the simulator UPS with minimum rating of 1 KVA (offline)			
		Keyboard (1 No) Minimum requirements: Connectivity Technology – wired Hardware interface – USB Dimension: 17 x 5.7 inches			
		24” Touch Monitor (1 No) Minimum requirements: Minimum requirements: - Native Resolution : 1920 x 1080			

		- Screen Size : 24" LED-backlit LCD or LED monitor touchscreen - Response time 6ms or better - Aspect Ratio: 16:9 - VESA 100x100mm - Contrast Ratio 1000:1 or better - Viewing angle (H/V) 160/160 deg - Inputs: VGA, DVI-D, Display Port, HDMI			
		Industrial Tracker Ball (1 No) - Industrial Quality - 3 buttons - Wired			
		ECR2 – Alarm, Monitoring and Remote-Control Console (1 No)			
		Console (1 No) Minimum requirements: - Shape and size to be compatible to an actual console in a ship (please specify the size (L*W*H) and minimum W to be 600 mm) - Console to be Marine Grade and suitable for use onboard ship (please specify the material and thickness of plate used for the console) - Product features (please specify)			
		Computer for the Console (1 No) Minimum requirements of the computers; -Intel(R) Core(TM) i7-12th gen Processor, Intel® Chipset -RAM ; 16GB in 1 DRAM module expandable to 32 GB -1 TB NVM.e SSD -Dedicated Current Generation Graphics card with 8GB VRAM (NVIDIA 37xx Generation or better) OR (AMD 7xxx Generation or better) -DisplayPort -1 Gbps GigbitE Ethernet port -Must be compatible with the engine control room equipment of the simulator			
		Keyboard (1 No) Minimum requirements: Connectivity Technology – wired Hardware interface – USB Dimension: 17 x 5.7 inches			

		24” Touch Monitor (1 No) Minimum Specifications: - Native Resolution : 1920 x 1080 - Screen Size : 24" LED-backlit LCD or LED monitor touchscreen - Response time 6ms or better - Aspect Ratio : 16:9 - VESA 100x100mm - Contrast Ratio 1000:1 or better - Viewing angle (H/V) 160/160 deg - Inputs : VGA, DVI-D. Display Port, HDMI			
		Industrial Tracker Ball (1 No.) - Industrial Quality - 3 buttons - Wired			
		ECR3 – Main engine remote control and indication console (1 No)			
		Console (2 Nos) Minimum requirements: - Shape and size to be compatible to an actual console in a ship (please specify the size (L*W*H) and minimum W to be 600 mm) - Console to be Marine Grade and suitable for use onboard ship (please specify the material and thickness of plate used for the console) - Product features (please specify)			
		Computer for the Console (1 No) -Intel(R) Core(TM) i7-12th gen Processor, Intel® Chipset -RAM ; 16GB in 1 DRAM module expandable to 32 GB -1 TB NVM.e SSD -Dedicated Current Generation Graphics card with 8GB VRAM (NVIDIA 37xx Generation or better) OR (AMD 7xxx Generation or better) -DisplayPort -1 Gbps GigbitE Ethernet port Must be compatible with the engine control room equipment of the simulator			
		24” **Touch Monitors (3 Nos)**			

		Minimum requirements: - Native Resolution : 1920 x 1080 - Screen Size : 24" LED-backlit LCD monitor touchscreen - Response time 6ms or better - Aspect Ratio : 16:9 - VESA 100x100mm - Contrast Ratio 1000:1 or better - Viewing angle (H/V) 160/160 deg - Inputs : VGA, DVI-D. Display Port, HDMI			
		Speed Set Lever for Main engine remote control and indication console (1 No) - Real Industrial grade Type Approval Equipment installed on vessel			
		Dead Man Alarm (DMA) (1 No) - Real Industrial grade Equipment			
		Engineers Reset (1 No) - Real Industrial grade Equipment Included power relay to which illumination in Engine Control room and Engine Room can be connected, causing lights in the rooms to go out during a blackout to increase realism.			
		Simulated CCTV System (1 No) Will be fitted above the ECR console			
		Computer (1 No) Minimum requirements of the computers; -Intel(R) Core(TM) i7-12th gen Processor, Intel® Chipset -RAM ; 16GB in 1 DRAM module expandable to 32 GB -1 TB NVM.e SSD -Dedicated Current Generation Graphics card with 8GB VRAM (NVIDIA 37xx Generation or better) OR (AMD 7xxx Generation or better) -DisplayPort -1 Gbps GigbitE Ethernet port and at least 300 Mbps internal Wi – fi Must be compatible with the engine control room equipment of the simulator			
		24" **Touch Monitor (2 Nos)**			

		Minimum Requirements: - Native Resolution : 1920 x 1080 - Screen Size : 24" LED-backlit LCD monitor touchscreen - Response time 6ms or better - Aspect Ratio : 16:9 - VESA 100x100mm - Contrast Ratio 1000:1 or better - Viewing angle (H/V) 160/160 deg - Inputs : VGA, DVI-D. Display Port, HDMI			
		Mounting Bracket for 24" LCD Touch Monitor (2 Nos) -Industrial type -Anti-corrosive			
21	**Log Printer**	**Log printer (1 No)** Minimum Specifications: - 24-pin dot matrix printer - impact dot-matrix printer for endless paper, black printing			
22	**Internal Telephone**	**Telephone located at Instructor station (master) (1 No)** - Batteryless Phone - Real phone use in onboard ship			
		Telephone located in Engine Control Room (1 No) - Batteryless Phone - Real phone use onboard ship			
		Telephone located in Engine Room (1 No) - Batteryless Phone - Real Phone use onboard ship			
		Telephone located in Emergency Generator Room (1 No) - Batteryless Phone -Real phone use onboard ship			
		Headset with microphone located in Engine Room (1 No) - Headset for Batteryless Phone system -Real phone use onboard ship			

23	**Main Switchboard Hardware**	**Approved Switch Board Console (1 No)** Minimum requirements: - Shape and size to be compatible to an actual console in a ship (please specify the size (L*W*H) and minimum W to be 600 mm) - Console to be Marine Grade and suitable for use onboard ship (please specify the material and thickness of plate used for the console) - Product features (please specify)			
		27" **Touch monitors (14 Nos)** Minimum requirements of the industrial grade touch screen monitors: - Native Resolution : 1920 x 1080 - Screen Size : 27" LED-backlit LCD or LED monitor touchscreen - 300 cd/m2 or better - Contrast Ratio 3000:1 or better - Inputs : DVI-D, VGA, DP, HDMI			
		Computer (7 Nos) Minimum requirements of the computers; -Intel(R) Core(TM) i7-12th gen Processor, Intel® Chipset -RAM ; 16GB in 1 DRAM module expandable to 32 GB -1 TB NVM.e SSD -Dedicated Current Generation Graphics card with 8GB VRAM (NVIDIA 37xx Generation or better) OR (AMD 7xxx Generation or better) -DisplayPort -1 Gbps GigbitE Ethernet port Must be compatible with the Main Switchboard Hardware			
		Sound system (1 No) One (01 No) Set of Speakers installed inside the main switchboard Minimum requirements should be: -Active 2 x 30 W -2- Way -4 Ohm -Power 220-240 VAC			
24	**Walkthrough, Interactive**	**65" Touch Monitor (4 Nos)**			

	3D software based operation, navigation, manipulation, component view, function/actions, annotation, etc. of the Engine and associated equipment	Minimum requirements: -Multi Touch 4K UHD (3840 x 2160) - Brightness: 350 cd/m3 - Contrast Ratio (typical): 4000:1 - Anti Glare Coating -Response Time (typical): 8 ms - Viewing angle (H/V) 160/160 deg - Power 220-240V AC 50-60 Hz, Consumption(typical) 165 W			
		Wall Mounting Bracket for 65" LCD Touch Monitor (4 Nos) -Industrial type -Anti-corrosive			
		Wall Bracket Extension for 65" LCD Touch Monitor (1 Nos) -Industrial type -Anti-corrosive			
		Computers for WalkThrough (4 Nos) Minimum requirements of the computers; -Intel(R) Core(TM) i7-12th gen Processor, Intel® Chipset -RAM ; 16GB in 1 DRAM module expandable to 32 GB -1 TB NVM.e SSD -Dedicated Current Generation Graphics card with 8GB VRAM (NVIDIA 37xx Generation or better) OR (AMD 7xxx Generation or better) -DisplayPort -1 Gbps GigbitE Ethernet port and at least 300 Mbps internal Wi – fi Must be compatible with the Engine Room Equipment			
		X-Box Controller for operation of WalkThrough VR (4 Nos) -Hand controller for operation of Walkthrough -A-MS Xbox One S Wireless Controller for Windows			
25	**Local Operating Station (LOS)**	Local Operating Console Station consists of: **Console (1 No)**			

		Minimum requirements: - Shape and size to be compatible to an actual console in a ship (please specify the size (L*W*H) and minimum W to be 600 mm) - Console to be Marine Grade and suitable for use onboard ship (please specify the material and thickness of plate used for the console) - Product features (please specify)			
		Computer for the Console (1 No) Minimum requirements of the computers; -Intel(R) Core(TM) i7-12th gen Processor, Intel® Chipset -RAM ; 16GB in 1 DRAM module expandable to 32 GB -1 TB NVM.e SSD -Dedicated Current Generation Graphics card with 8GB VRAM (NVIDIA 37xx Generation or better) OR (AMD 7xxx Generation or better) -DisplayPort -1 Gbps GigbitE Ethernet port Must be compatible with the Local Operating Station			
		Keyboard (1 No) Minimum requirements: Connectivity Technology – wired Hardware interface – USB Dimension: 17 x 5.7 inches			
		24” Touch Monitor (1 No) Minimum requirements: - Navtive Resolution : 1920 x 1080 - Screen Size : 24" LED-backlit LCD monitor touchscreen - Response time 6ms or better - Aspect Ratio : 16:9 - VESA 100x100mm - Contrast Ratio 1000:1 or better - Viewing angle (H/V) 160/160 deg - Inputs : VGA, DVI-D. Display Port, HDMI			
		Industrial Tracker Ball (1 No) - Industrial Quality - 3 buttons			
26	**Engine Room Sound**	Minimum requirements:			

	System	-DB Opera SUB 12 (1 No) - DB L160 Loudspeaker (4 Nos) - DB WB03 Loudspeaker Brackets (4 Nos)			
27	**Alarm Horn and Lamp**	-Alarm handling tower with horn and lamp Minimum Specifications: - Power: 220-240V AC or 24V DC -Real Equipment onboard ship			
28	**Emergency Generator Room**	Emergency Generator Room consists of: **Instrument Console (1 No)** Minimum requirements: - Shape and size to be compatible to an actual console in a ship (please specify the size (L*W*H) and minimum W to be 600 mm) - Console to be Marine Grade and suitable for use onboard ship (please specify the material and thickness of plate used for the console) - Product features (please specify)			
		Computer for the Console (1 No) Minimum requirements of the computers; -Intel(R) Core(TM) i7-12th gen Processor, Intel® Chipset -RAM ; 16GB in 1 DRAM module expandable to 32 GB -1 TB NVM.e SSD -Dedicated Current Generation Graphics card with 8GB VRAM (NVIDIA 37xx Generation or better) OR (AMD 7xxx Generation or better) -DisplayPort -1 Gbps GigbitE Ethernet port Must be compatible with the Emergency Generator Room equipment			
		Keyboard (1 No) Minimum requirements: Connectivity Technology – wired Hardware interface – USB Dimension: 17 x 5.7 inches			
		24” **Touch Monitor (1 No)** Minimum Specifications: - Native Resolution : 1920 x 1080 - Screen Size : 24" LED-backlit LCD			

		monitor touchscreen - Response time 6ms - Aspect Ratio : 16:9 - VESA 100x100mm - Contrast Ratio 1000:1 - Viewing angle (H/V) 160/160 deg - Inputs : HDMI, VGA, DVI-D. Display Port			
		Industrial Tracker Ball (1 No) - Industrial Quality - 3 buttons			
		Sound system (1 No) - Active 2x30W - 2-way - White - 4 Ohm - Power 220-240V AC			
29	**Instructor Station Hardware**	Instructor Station Consists of : **Computer (1 No)** Minimum requirements of the computers; -Intel(R) Core(TM) i7-12th gen Processor, Intel® Chipset -RAM ; 16GB in 1 DRAM module expandable to 32 GB -1 TB NVM.e SSD -Dedicated Current Generation Graphics card with 8GB VRAM (NVIDIA 37xx Generation or better) OR (AMD 7xxx Generation or better) -DisplayPort -1 Gbps GigbitE Ethernet port and at least 300 Mbps internal Wi – fi Must be compatible with the Instructor Station Hardware			
		Keyboard (1 No) Minimum requirements: Connectivity Technology – wired Hardware interface – USB Dimension: 17 x 5.7 inches			
		Mouse (1 No) Minimum Specifications: Sensor: optical , 1000 DPI sensitivity Buttons: Two primary buttons clickable			

		scroll wheel USB			
30		24" **Monitor (1 No)** Minimum Specifications: - screen size 24" - Native resolution 1920x1200 (16:10) - Contrast ratio 1000:1 or better - Response time 8ms or better - Brightness (typical) 300 cd/m2 - Viewing angle (H/V) 160/160 deg - VESA 100x100mm - Supports VGA, DVI-D. Display Port, HDMI, DP			
31		**Color laser printer (1 No)** - Printing A4: Approximately 20 ppm - Singleand double-sided printing - Secure Print - Memory: 1 GB - Display: 5 line LCD - 250 sheet cassette - USB 2.0 Hi-Speed, 10BASE-T/100BASE-TX/1000Base-T, Wireless 802.11b/g/n, Wireless Direct Connection " - Power 220-240V AC			
32	**Server Station**	**NAS File Server (1 No)** Minimum Specifications: - CPU: Quad Core 1.4 GHz or better - 2x Ethernet 1000Base-T - 2x USB 3.0 - RAID 0, RAID 1, RAID 5, RAID 6, RAID 10, JBOD - Power 220-240V AC (50/60 Hz) - 2 x HDD 4TB Enterprise Grade			
		Network Switch 24 ports (1 No) Minimum Specifications: - 24 RJ-45 Auto-Negotiating 10/100/1000 Ports - 4 SFP 1000 MBPS Ports			
		Network Switch 8 ports (3 Nos) Minimum Specifications: - 8 RJ-45 Auto-Negotiating 10/100/1000 Ports			

		- 2 SFP 1000 MBPS Ports			
		Firewall Router (1 No) Minimum Specifications: - 4x LAN 10/100/1000 RJ45 - 1x WAN 10/100/1000 RJ45 - 1x USB for Backup -External Power Adaptor (220-240V AC)			

Appendix 1.2

Specification: **Engine Desktop Simulator System Software (26 Nos)**

Item No.	Specification/s	Requirements	Conformity		If No, Bidder's Response
			Yes	No	
Desktop Simulator Engine Models Software and Licenses (Slow Speed 26 Nos, Medium Speed 26 Nos, High Speed 26 Nos)					
1	**Slow Speed Engine Model** Desktop Software and licenses should be provided for the model of **a slow speed engine** with dual fuel /LNG driven and electronically controlled system suitable for **an oil Tanker**	**Slow speed Engine model desktop licenses (26 Nos)**			
		Main propulsion engine of propulsion power 750 kW or more			
		Minimum 6 number of Piston Cylinders inline			
		2 Stroke			
		Speed range: 80 – 120 rpm			
		Functional and Visualization Requirements of Desktop simulator Engine Model software:			
		-Integrated monitoring, automation and diagnostics systems simulation			
		-Freshwater generation system			
		-Auxiliary power generators and management of such systems			
		-Comprehensive engine starting and stop systems.			
		- Comprehensive engine cooling system			
		-Comprehensive simulation of boiler systems			
		-Comprehensive lubricating oil management systems			
		-Stern tube thermal management systems			
		-Steering system			
		-Main engine control (onsite/remote) system			
		-Comprehensive simulation of main engine hydraulic systems			
		-Cylinder indicator diagrams			
		-Air ventilation system			
		-Refrigeration system			
		-Sewage treatment plant			
		-Incinerator plant			
		-Bilge wells & bilge separator system			
		-Ballast system			
		-Inert gas system			
		- Turbo charger Systems			
		-Ship loading system.			
		-Firefighting systems (automatic and manual).			
		-Other emergency and safety systems			

		(please specify)			
		-Comprehensive emission control system			
		-Full walkthrough of the engine room			
		-Switchboards, distribution, and Panels for Electric Power and Lighting			
		-Comprehensive Safety Warning System			
		- Propulsion Control System			
		-Comprehensive electrical power system			
		-Bow Thruster			
		-Battery Charging System			
		-Other Additional features (please specify if any)			
2	**Medium Speed Engine Model** Software and licenses should be provided for the model of **a medium speed engine** with dual fuel /LNG driven and electronically controlled system suitable for **a dry cargo- ship**	**Medium speed Engine model desktop licenses (26 Nos)**			
		Main propulsion engine of propulsion power 750 kW or more			
		Minimum 6 number of Piston Cylinders inline			
		2 Stroke			
		Speed range: 300 – 1000 rpm			
		Functional and Visualization Requirements of Desktop simulator Engine Model software:			
		-Integrated monitoring, automation and diagnostics systems simulation			
		-Freshwater generation system			
		-Auxiliary power generators and management of such systems			
		-Comprehensive engine starting and stop systems.			
		- Comprehensive engine cooling system			
		-Comprehensive simulation of boiler systems			
		-Comprehensive lubricating oil management systems			
		-Stern tube thermal management systems			
		-Steering system			
		-Main engine control (onsite/remote) system			
		-Comprehensive simulation of main engine hydraulic systems			
		-Cylinder indicator diagrams			
		-Air ventilation system			
		-Refrigeration system			
		-Sewage treatment plant			
		-Incinerator plant			

		-Bilge wells & bilge separator system			
		-Ballast system			
		-Inert gas system			
		- Turbo charger Systems			
		-Ship loading system.			
		-Firefighting systems (automatic and manual).			
		-Other emergency and safety systems (please specify)			
		-Comprehensive emission control system			
		-Full walkthrough of the engine room			
		-Switchboards, distribution, and Panels for Electric Power and Lighting			
		-Comprehensive Safety Warning System			
		- Propulsion Control System			
		-Comprehensive electrical power system			
		-Bow Thruster			
		-Battery Charging System			
		-Other Additional features (please specify if any)			
3	**High Speed Engine Model** Software and licenses should be provided for the model of **a high speed engine** with dual fuel /LNG driven and electronically controlled system suitable for **a container carrier**	**High speed Engine model desktop licenses (26 Nos)**			
		Main propulsion engine of propulsion power 750 kW or more			
		Minimum 6 number of Piston Cylinders inline			
		2 Stroke			
		Speed : above 1200 rpm			
		Functional and Visualization Requirements of Desktop simulator Engine Model software:			
		-Integrated monitoring, automation and diagnostics systems simulation			
		-Freshwater generation system			
		-Auxiliary power generators and management of such systems			
		-Comprehensive engine starting and stop systems.			
		- Comprehensive engine cooling system			
		-Comprehensive simulation of boiler systems			
		-Comprehensive lubricating oil management systems			
		-Stern tube thermal management systems			

		-Steering system			
		-Main engine control (onsite/remote) system			
		-Comprehensive simulation of main engine hydraulic systems			
		-Cylinder indicator diagrams			
		-Air ventilation system			
		-Refrigeration system			
		-Sewage treatment plant			
		-Incinerator plant			
		-Bilge wells & bilge separator system			
		-Ballast system			
		-Inert gas system			
		- Turbo charger Systems			
		-Ship loading system.			
		-Firefighting systems (automatic and manual).			
		-Other emergency and safety systems (please specify)			
		-Comprehensive emission control system			
		-Full walkthrough of the engine room			
		-Switchboards, distribution, and Panels for Electric Power and Lighting			
		-Comprehensive Safety Warning System			
		- Propulsion Control System			
		-Comprehensive electrical power system			
		-Bow Thruster			
		-Battery Charging System			
		-Other Additional features (please specify if any)			
Desktop Simulator System Instructor Software Licenses (02 Nos)					
4	Desktop Simulator System Instructor Software License – Instructor System Professional	**Instructor System Professional software license (2 Nos)** An instructor should be able to manipulate and monitor the learning activities done by students with the desktop Simulator system			
		- Must be able to monitor and control the students in the classroom such as start, run, pause and set up groups for team training.			
		- Must be able to create an exercise structure that comprises initial conditions			

		and scenario modules which, dependent on the type of exercise, may include triggers, electronic messaging to trainees, set actions and malfunctions, and assessment systems.			
		-The instructor must access the control configuration tool used by the Instructor to configure the various student stations to fit the different exercises. This should include: level of information visible in the various system diagrams level of information that is possible to maybe accessed. System(s) to be accessible from multiple stations, Access level regarding alarm system, Access level regarding access to variable and malfunction pages			
		-An assessment system can display the users state (active and Inactive) and all overview of what is carried out			
		-Logic Block-Based editor is used to build triggers which again is used to activate messages, actions, malfunctions, and assessments. Building blocks are based on Boolean algebra (logic).			
		-Capable of coach messaging that shall be able to simulate as the master, engineer, or Instructor himself.			
		-Capable of editing the actions to be carried out, such as delay, ramping, and reset value criteria.			
		-Assessment System must be able to: Calculate the total score. Capable for positive and negative deductions. Capable to the type of error, critical or non-critical (must be achieved to pass) time used from fault appear to proper action is taken. Rate of score/penalty points, discrete or integrating. System can manipulate when to freeze/start/stop the assessment.			
		-must be able to create and print the assessment.			
		-must be able to start the recording the exercise system automatically.			
		-replays from any point in time for training or recording of unlimited lengths can be saved and stored for later use.			
		-speed of the simulation can be changed based on the exercise to ensure delivery.			