Tamil Nadu Dr. J. Jayalalithaa Fisheries University
Paraprofessional Institute of Fisheries Technology
Madhavaram, Chennai – 51.

No. A5-1/TNJFU/ PPIFT/ Fishing and Navigation Simulator/2020 Dt:22.01.2020

TENDER NOTICE

For and on behalf of the Vice-Chancellor, Tamil Nadu Dr.J.Jayalalithaa Fisheries University, sealed tenders (Two cover systems) are invited by the Principal, Paraprofessional Institute of Fisheries Technology, Madhavaram, Chennai – 51 for the supply of Fishing and Navigation Simulator. The tender schedule with the technical specifications can be downloaded from University website www.tnjfu.ac.in from 22.01.2020.

Tenders shall be submitted in sealed cover (Two cover system) enclosing the prescribed EMD as Demand Draft drawn in favour of "The Principal, Paraprofessional Institute of Fisheries Technology, Madhavaram, Chennai – 600 0051" from any nationalized bank. Tenders submitted without EMD will summarily be rejected.

The last date of submission of tender is 10.02.2020 at 3.00 pm. For further details, kindly contact principalppift@tnfu.ac.in (or) The Principal, PPIFT, Madhavaram, Chennai. Mobile No.94427 58740.

Principal
PPIFT, Chennai.

Tamil Nadu Dr. J. Jayalalithaa Fisheries University
Paraprofessional Institute of Fisheries Technology, Madhavaram, Chennai – 51.

TENDER FORM AND CONDITIONS

No. A5-1/TNJFU/PPIFT/Fishing and Navigation Simulator/2020 Dt:22.01.2020

I. GENERAL

Last date for submission of Tender – 10.02.2020 upto 3.00 pm
Date of Opening of Tender – 11.02.2020 at 10.00 am
Tenders should state in the body of their letter
Whether they are: i) Manufacturer
ii) Manufacturer's authorized agents
iii) Holders of stock of the stores tendered for
iv) GST No. should be furnished

II. DEVIATION FROM SPECIFICATION

The tenders are requested to study the specification state below.

1. Tamil Nadu Dr. J Jayalalithaa Fisheries University invites bid under two bid system (Two cover system, Part I-Technical bid, Part II- Financial bid) for "Supply, Installation, Testing and Commissioning of Fishing and Navigation Simulator from Simulator manufacturers having experience in similar Works. The scope of the work is:

- Supply, installation, Testing and Commissioning of Fishing and Navigation Simulator at College of Fisheries and Nautical Technology, Tamil Nadu Dr. J Jayalalithaa Fisheries University, Tuticorin campus with warranty for 2 years.
- Post warranty Comprehensive Annual Maintenance Contract (CAMC) through fully qualified local support Centre for next 5 years from the date of expiry of warranty. However, CAMC will not be considered for L1 Determination.

The technical specifications (Annexure 1) can be downloaded from the university website www.tnjfu.ac.in

2. Eligibility Criteria

2.1 The Bidder should be in the Simulation Business for a period not less than 10 years

2.2 It is an essential requirement that the bidder has taken up and satisfactorily executed and completed Similar Supply with minimum value specified in any one of the three set of values (a or b or c) carried out during the last five financial years i.e. from 01.04.2014 to 31.03.2019.

a) At least one similar supply with a minimum value of Rs. 50 Lakhs
b) At least two Similar Supply with a minimum value of Rs. 30 Lakhs each
c) At least three Similar Supply with a minimum value of Rs. 20 Lakhs each

2.3 The offered Simulator shall be supported by 'Statement of Compliance' from DNV- GL, confirming that the product is found to comply with Standard for Certification of Maritime Simulators No. DNVGL-ST-0033 for the appropriate Class.

2.4 It will be an essential requirement that the prospective bidder shall be fully equipped & capable to carry out the maintenance, repair to meet obligation under warranty & CAMC as prescribed in the bid.

2.4.1. The evaluation shall be carried out by following the procedure of Quality and Cost Based Selection (QCBS). The bids scoring 70% and above shall be declared qualified and the bid obtaining highest Final Score (FS) shall be declared successful bid.

2.4.2. The Bids shall be evaluated technically and commercially by a Committee. It is mandatory on part of the bidder to score a minimum of 70% marks in the technical evaluation to qualify for the opening of the commercial bid.

2.4.3. The commercial bid of only those bidders shall be opened who technically qualify. Once technically qualified, the bidders will be informed about opening of the commercial bids.

3. Technical Evaluation Criteria:

3.1 The Technical Evaluation shall be carried out based on the following attributes t as certain the quality of the bid.

Sl. No	Attributes	Max Marks	Evaluation criteria
1	Class Approved Navigation / Fishing Simulators.	20	Approved to DNV-GL Standards Latest accreditation/Certification (2018 or later) – 20 marks Before 2018 – 10 marks

2	Experience in similar class of works-Supply, Installation and commissioning of Marine/ Navigation/ Fishing Simulators to Government institutions in India.	20	i) ≥ 5 Govt. installations during last 5 years – 20 marks. ii) 3-4 Installations – 10 marks iii)1-2 installations – 5 marks
3	The simulator is offered by OEM in India	20	Bidder is OEM – 20 marks Bidder is Agent or Representative – 0 marks
4	Local Support in Tamil Nadu, India	20	Support infrastructure/personnel available in Chennai or other major city in Tamil Nadu Provision of Spares for warranty period
5	Minimum 2 years warranty.	20	3 years or more – 20 marks 2 years – 10 marks
	Total	**100**	

3.2. Evaluation Procedure

- Technical bids will be opened at the Tamil Nadu Dr. J Jayalalithaa Fisheries University campus. Any bidder who is willing to observe the tender opening, may, in person or through his authorized representative, be present at the venue and witness the tender opening.

- Technical bid (Cover–I) of each bidder shall fulfil the minimum eligibility criteria prescribed in this tender document.

- The information furnished by the bidder in Cover - I as part of the tender document by the university will form the basis for the technical evaluation. The university reserves the right to obtain any clarifications from any of the bidders. If, in the opinion of the university, information and documents supplied in support of the tender do not meet the minimum eligibility criteria as per NIT and any or some of the technical specifications as per Notice Inviting Tender (NIT), the tender / product offering will be treated as non-responsive and rejected and their Cover II – Price bid shall not be opened for evaluation.

- The Technical bid of each bidder shall be evaluated by the committee based on the attributes mentioned in the above table and marks obtained by them will be denoted as Technical Score (TS).
- The Technical bids having Technical Score (TS) of 70 % and above shall be declared technically qualified. Financial bid of only those bidders shall be considered for opening, who have Technical Score (TS) of 70 % and above in the technical evaluation.

- A suitable date and time for opening of the Cover II – Price Bids will be fixed and those bidder(s) who have Technical Score (TS) of 70 % and above in the technical evaluation will be intimated through email about the opening of Cover - II – Price Bids or alternatively, the date may be published in the university website.
- After evaluating the price bids received under Cover II, the bidder who quoted the total lowest (L-1) Price will be determined.
- If the lowest bid (L1) is from the local supplier, the contract will be awarded to that supplier.
- If the lowest bid is from a non-local supplier, the local supplier whose bid is the lowest among the category of local suppliers will be given an opportunity to match the price offered by the non-local lowest bidder provided the local supplier's bid is within the 'margin of price preference'. Subject to such a local supplier agreeing to match the L1 price, contract will be awarded to the local supplier.
- The 'margin of price preference' is defined as 'the maximum extent to which the price quoted by a local supplier may be above the L1 for the purpose of purchase preference'. This margin has been fixed at 20 per cent in the Notification of Public Procurement (Preference to Make in India) Order, 2019 by the Ministry of Commerce, Department of Industrial Policy and Promotion (DIPP) issued on 29th May, 2019.
- The 'local content' is defined as 'the amount of value added in India' which will be 'the total value of the item procured (excluding the net domestic indirect taxes) minus the value of imported content in the item (excluding all customs duties) as a proportion of the total value' in percentage terms.
- 'In pursuance of the aforesaid order of Department of Industrial Policy & Promotion (DIPP), the local content percentage prescribed below shall be applicable for the various components associated with the supply of Simulators to Tamil Nadu Dr. J Jayalalithaa Fisheries University – Thoothukudi Campus:

"Local Content" - Suppliers that meet the minimum percentage of "Local Content" of 85% of the Software for the Simulators shall qualify for the "Margin of Purchase Preference".

S No.	Item	Minimum Local Content	
		2019 - 2020	Stipulated Over the next 3 years
1.	Simulator Software	85%	100%

"Local Supplier" - Suppliers that meet all the criteria listed below shall considered to be a "Local Supplier"

i. The company shall be registered in India under Companies Act 1956 as amended in 2013.
ii. The software development, design and engineering (including the IPR) activities related to the simulators are carried out in India.
iii. The simulator software / computer program copyright is registered in India.

Exclusions

The following items shall be excluded:

i. Simulator Hardware - Specialized IT infrastructure items, such as VR/AR equipment, motion systems, sensors, real-time visualization hardware including projectors, graphic cards, including the housing, packaging of these items and similar.
ii. Standard Off-the-Shelf and other IT items such as computers & servers, operating system software, open source software, software tools and similar, networking equipment, LCD/LED & similar display devices, including the housing, packaging of these items and similar.
iii. Documentation and Services - Installation, Training, Internet, Hosting, Manuals, Warranty, Support and similar.
iv. Physical infrastructure items, i.e. any work related to building, construction, interior designing/decoration, air conditioning, and similar.
v. Freight, insurance, handling and similar.
vi. Imported licenses, components and royalties paid where the ultimate beneficiary is outside India.
vii. Taxes, Duties and similar as applicable.

PRICE BID TEMPLATE

Sl. No	Description of the items.	Qty.	Price (INR)	Total (INR)
1	Fishing and Navigation Simulator Software	1 Set		
2	Hardware HMI (Human Machine Interface) units	1 Set		
3	Installation, Commissioning and Training Services	1 Set		
Total Amount in Figures excluding GST / Applicable Taxes				
GST / Applicable Taxes				
Total Amount in Figures including GST / Applicable Taxes				

ANNUAL MAINTENANCE CONTRACT

Annual Maintenance Contract (AMC) cost for 5 years post completion of warranty period, to be quoted separately. It will not be considered for L1 determination.

Comprehensive Onsite Maintenance for 1st yr immediately after warranty (Amount in INR including Taxes)	Comprehensive Onsite Maintenance for 2nd yr immediately after warranty (Amount in INR including Taxes)	Comprehensive Onsite Maintenance for 3rd yr immediately after warranty (Amount in INR including Taxes)	Comprehensive Onsite Maintenance for 4th yr immediately after warranty (Amount in INR including Taxes)	Comprehensive Onsite Maintenance for 5th yr immediately after warranty (Amount in INR including Taxes)

SERVICE CONDITION

Guarantee period and after sales service condition to be mentioned. In case of deviation or alterations, the same should be brought out boldly and prominently in the offer made.

III. Any terms or conditions not brought out in the body of the offer will not be considered.

IV. In case any condition or terms of contract applicable in the invitation of tender is not acceptable to the tendering firm, they should specifically state deviation there from in the body of their tender

V. In the body of the letter, the tenderer should specially state that he agrees for sale arbitration by The Principal, Paraprofessional Institute of Fisheries Technology, Madhavaram, Chennai – 600 051.

VI. PRICE

a. Prices must be in terms of rupees and paise.
b. The unit prices should be for the equipment as indicated in the schedule of tender
c. Prices quoted should be for delivery at site, as specified by the Principal, Paraprofessional Institute of Fisheries Technology, Madhavaram,Chennai–600 051.
d. Discount if any, should be indicated prominently.
e. Prices quoted shall be firm in all respects and for each equipment
f. Tenders with price variation basis will not be accepted
g. The offer should be kept valid for six months from the date of tender and supply is expected before.

VII. The tenderer is solely responsible for the equipment till delivery and demonstration of the equipment.

VIII. EARNEST MONEY, SECURITY DEPOSIT AND EXECUTION OF AGREEMENT

Each tender should be accompanied by an **Earnest Money Deposit (EMD)** of **1% of the total value** in the form of Demand Draft drawn in favour of **The Principal, Paraprofessional Institute of Fisheries Technology payable at Madhavaram, Chennai – 600 051** failing which the tender will not be considered. Cheques will not be accepted. If for any reason the tenderer withdraws the tender before or after being selected or before being rejected by the competent authority, The Principal, Paraprofessional Institute of Fisheries Technology, Madhavaram, Chennai – 600 051 reserves the right to forfeit the deposit in part or in full. The Earnest Money Deposited will be refunded to the unsuccessful tenderers. In case of successful tenderers, the amount will be adjusted towards Security deposit.

The successful tenderer (herein after referred to as Contractor) shall also furnish a **Security deposit of not less than 5% of the total value of the equipment** within 15 days from the date of intimation of the acceptance of the tender.

The security deposit will be refundable only after the expiry of a period of ONE YEAR from the date of handing over the stores in working condition/completion of work to the full satisfaction and upon The Principal, Paraprofessional Institute of Fisheries Technology, Madhavaram, Chennai – 600 051 issuing a certificate that no amount is due from the contractor under the agreement and that the contract executed an agreement on a non-judicial stamp paper of the value of to be fixed incorporating the terms and conditions of the contract within one month from the date of intimation of the acceptance of the tender. In case of default of these conditions i.e. remitting security deposit and executing agreement within the time allowed, the Earnest Money Deposit (EMD) will be forfeited without prejudice to any other right of the University will also be entitled to make other arrangement for obtaining these items from others and recover from the university over the contract price together with charges, expenses and damages attending to such purchases provided The Principal, Paraprofessional Institute of Fisheries Technology, Madhavaram, Chennai – 600 051 in specific application from the contract grant extension of time in specific circumstances in the matter of payment of security deposit and execution of agreement.

IX. DELIVERY

The supplies shall be subject to inspection and acceptance or rejection by the Principal, Paraprofessional Institute of Fisheries Technology, Madhavaram, Chennai – 600 051 or such other person as the Principal, Paraprofessional Institute of Fisheries Technology, Madhavaram, Chennai – 600 051 shall from time to time name and

appoint for this purpose, the said person to be named and appointed being hereafter referred to as the Inspection Officer. Delivery of the item should be done at "the College of Fisheries and Nautical Technology, Fishing Harbour Campus, Thoothukudi".

The supply made by the tenderer which in the opinion of The Principal, Paraprofessional Institute of Fisheries Technology, Madhavaram, Chennai – 600 051 or the Inspecting Officer is bad order, unsound in quality or description or not in accordance with specifications as have been prescribed in that behalf of otherwise fault or unfit for use, shall be rejected.

The supplies so rejected shall be removed by and that the expenses of tenderer within 15 days after he has been given notice of the rejection. If not taken away, The Principal, Paraprofessional Institute of Fisheries Technology, Madhavaram, Chennai – 600 051 may cause the goods to be removed and disposed off in the manner he may deem fit and recover from the tenderer the expenses incurred in such removal and disposal.

The substitution of supplies which have been rejected by The Principal, Paraprofessional Institute of Fisheries Technology, Madhavaram, Chennai – 600 051 or the Inspecting Officer in whole or in part under the provisions herein before contained the tenderer shall and will within the time permitted by The Principal, Paraprofessional Institute of Fisheries Technology, Madhavaram, Chennai – 600 051 or the Inspection Officer after such rejection shall have been notified to him as aforesaid supply and delivery without causing any extra cost of expenditure. If not so supplied and delivered by the tenderer or substitution, as aforesaid and also in case of failure by the tenderer to supply and deliver supplies demanded from line under this tender within the period prescribed for supply and delivery, The Principal, Paraprofessional Institute of Fisheries Technology, Madhavaram, Chennai – 600 051 or the Inspecting Officer shall have power to purchase from others *in lieu* of rejected or not delivered goods and any excess expenditure or cost incurred by the University over and above the tenderer price together with all charges and expensed attending to the purchase shall be recoverable from the tenderer. Nothing herein contained shall prejudice any other right of the University in that behalf under the tender or otherwise.

X. A guarantee towards the supply of spares parts if any when required on the agreed basis for on agreed price.

XI. The tenderer shall furnish the following Guarantee: A guarantee to the effect that articles supplied shall be of the best quality and workmanship and shall be in with such quantities and such price. A guarantee for a period of one year or more from the date of handing over the equipments for the proper functioning of the equipment and systems and any defects in their proper function during the guarantee period should be rectified by the tenderer at free of charge. If during the

guarantee period, the supplies are found not to the description and quality offered, the University will be entitled to reject the articles and the supplier shall replace or pay the University such damages that may arise including the replacement of cost and towards delay and damages. Nothing herein contained shall prejudice any other right of the University if that behalf under the tender otherwise.

XII. TRANSFER OF SUPPLY

The tenderer shall not transfer or assign the supply or any part there or any interest therein directly or indirectly to any person or persons whomsoever without the written consent of the University.

XIII. If the supply order is placed on a higher tenderer as a result of inability of the tenderer then he will be liable to pay the University the difference between the supply rate and that the lowest acceptable tender. This is in addition to and without prejudice to other rights under the terms of the tender.

XIV. INSTALLATION AND TESTING

All the goods as per the supply order are to be delivered at the College of Fisheries and Nautical Technology, Fishing Harbour campus, Thoothukudi, Installation and Testing is to be carried out at the same campus.

a) The time allowed for completion of supply and delivery as prescribed including demonstration under the conditions of the tender is the essence of the tender.

b) Without prejudice to other rights under the terms of this tender or otherwise.

c) If the tenderer fails in the due performance of this supply within the time fixed in the supply or any extension thereof, the tenderer is liable to pay as liquidated damages up to 2% per month of the supply value of such portion of the materials as have not been delivered, installed and commissioned and having been delivered, installed and commissioned cannot in consequence of the delay be used efficiently during each month between the appointed or extended time as the case may be and the actual time of delivery installation.

d) The tenderer is not entitled for any enhancement of the rates once accepted. It shall be lawful for the purchaser to set off any loss or expense or cost of damages sustained or incurred by the purchaser by reason of the cancellation of the tender form and out of any nominees for the time being payable or due to the tenderer from the University otherwise apart from forfeiting the security deposit furnished by the tenderer.

e) All sums found due to the University under or by virtue of these presents shall be recoverable from the tenderer in any manner as the University may deem fit.

XV. Any notice or communication to the tenderer shall be deemed to be sufficiently served if given or left in writing at his usual or last known place of abode.

XVI. All questions disputes or differences arising under, out of or in connection with the supply, if not concluded shall be subject to the exclusive jurisdiction of the place from which the acceptance of the tender is issued, is situated.

XVII. The tenderer have to send manufacturer licence, Declaration Certificate, IT statement for the past three years, GST Certificate and Performance certificate for tender finalization.

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ANNEXURE – I

TECHNICAL SPECIFICATIONS

The Fishing and Navigation Simulator should meet the relevant guidelines of the STCW & STCW-F Convention. The Simulator should be validated and certified to industry standards by an agency deputed to such works. Such agency includes Classification Society (IACS members only).

1. **Simulator specifications**: The simulator consisting of a ship station with instruments of navigation as listed below, as well as display of target ships and surroundings as seen from a wheel house.

1.1 Equipment and consoles to be installed, mounted and arranged in a ship-like manner.

1.2 A separate control for instructor with equipment necessary to monitor the activities in the wheel house effectively.

1.3 The equipment installed in the simulator shall have a similar functionality to corresponding equipment used on board.

1.4 If any equipment does not correspond to the specific make, the applicable IMO performance standard (functionality requirement) for such equipment shall be followed.

1.5 If such a performance standard does not exist, then the functionality of equipment shall, as a minimum, be the same as for any recognized genuine equipment of that type, in use on board ships.

1.6 Equipment as fitted shall resemble the behavioural characteristics for example; accuracy, reaction time and other limitations, related to corresponding equipment in use on board ships.

1.7 User manuals for the simulator equipment and operational control shall be available to the learners for use during exercise.

2. **Ship types and Areas:**

2.1 The simulator shall include mathematical models of at least 4 own ships (including fishing vessels). The model shall resemble accurately the behavioural characteristics of an actual ship of that size, power and type, and realistically behave as per the hydrodynamic effects of wind, current and swell.

2.2 The simulator shall be able to present at least 10 different types of targets each equipped with mathematical models, which account for motion, drift and steering angle according to forces induced by current, wind and wave.

2.3 The simulator shall be able to provide at least 5 international geographical visual areas, including 3 Fishing areas Tuticorin, Chennai and Kanyakumari for exercise which include open sea and high density traffic areas.

3. Detailed Specification:

3.1 Visualization:

3.1.1 At least 3 or 5 channel visualization of HD resolution

3.1.2 The visual display type of at least 40 inches diagonal size on each screen. The visual system shall present all navigation marks as displayed on paper charts for that area.

3.1.3. The visual system shall show objects with sufficient realism (detailed enough to be recognized as in real life) The visual system shall replicate movements of all own ships according to 6 degrees of motion freedom.

3.1.4 The simulator shall provide a realistic visual scenario by day, twilight or night, changing with time. It shall be possible to create a range of visual conditions ranging from clear to partial [rain, haze] to restricted [dense fog]".

3.1.5 It shall be possible to take reasonably accurate bearing of objects seen on the screen preferably using an azimuth mirror on the gyro compass or Pelorus for relative bearings.

3.1.6 It shall be possible to use magnified views of the observation.

3.1.7 The visual system shall present at least a total of 20 degrees of vertical field view.

3.1.8 There should be proper correspondence between the visual picture and radar.

3.2 Simulator Capabilities:

3.2.1 The model shall realistically simulate own ship hydrodynamics in open water conditions, including the effect of wind forces, wave forces, tidal stream and currents.

3.2.2 The model shall realistically simulate own ship hydrodynamics in restricted waterways including shallow water and bank affects and interaction with other ships.

3.2.3 The simulator shall provide an own ship engine sound reflecting the power output.

3.2.4 The target ships shall be equipped with navigational lights, shapes, and sound signals according to the "Rules of the Roads". The signal should be individually controlled by the instructor and the sound signal shall be directional and vary with range.

3.2.5 The simulator shall be able to present at least 10 target ships. At the same time, where the instructor shall be able to program routes for each target ship individually.

3.2.6 The simulator shall be capable of providing environmental sound (for example; wind) according to condition simulated.

3.2.7 The simulator shall include the depth according to chart used, indicating water depth according to tidal heights.

3.2.8 The simulator shall provide waves, variable in direction and strength.

3.3 Own Ship Control Station:

The following shall be provided, installed, mounted and arranged in a manner that it would physically resemble the front panel of a ship's navigating bridge. The hardware panel should have operational resemblance to actual ship-board equipment.

3.3.1 Propulsion control for controlling own ship's engine ahead and stern.

3.3.2 Steering control: There shall be provision for the following, at or near the console

1. Steering wheel
2. Steering motor
3. Hand steering
4. Compass repeater able to depict gyro and / or magnetic headings
5. Gyro failure alarm
6. Auto-pilot (Basic auto-pilot for setting headings)

3.3.3 Engine Alarms: Giving audible and visual alarm in the case of:

1. Start fail
2. Shut-down

4. Radar set and automatic radar plotting aides (ARPA):

4.1. ARPA

4.1.1 The radar shall be capable of being operated in sea stabilized relative motion mode and sea and ground stabilized true motion modes.

4.1.2 The Radar Simulation Equipment shall be capable of generation of interface, noise, radar / ARPA failure, yawing, clutter, spurious echoes, blind sector, parallel index lines.

4.1.3 The ARPA simulation equipment shall incorporate the facilities for:

1. Manual and automatic target acquisition.
2. Past track information

3. Use of exclusion areas
4. Vector / graphic time and data display
5. Trial manoeuvres

5. ECDIS

The simulator shall include ECDIS software providing the functionality of a ship-board ECDIS system.

Some of the available features are as follows:

- Basic navigational functions and settings
- Operation of Electronic Charts, ARCS, C-Maps etc. & Chart updating
- Route planning check functions
- Route monitoring functions
- Required indications and alarms
- Display of navigational sensor information
- Overlay of ARPA target information
- RADAR overlay function
- Overlay of AIS information
- Typical Sensor Faults & Failures
- Data recording & playback
- Presentation of ECDIS data in accordance with the requirements
- Route Planning and Monitoring functions

6. Indicators:

6.1 Own ship station shall have at least the following indicators:

i) Wind direction and speed indicator

ii) Rudder angle indicators

iii) RPM indicator

7. Ship's horn: To be provided on the wheel house consol as a push button.

8. The following equipment shall be simulated:

8.1 Electronic Navigation Aide: Global position system. Simulation of all facilities of a standard GPS receiver shall be available. This shall include display in latitude, longitude, course and speed over ground by the own ship, UTC, normal navigational calculation functions such as; great circle, rhumb line sailing, way points, alarms for X-track error, etc.

8.2 Echo-sounder: Simulation of complete echo-sounder shall be provided.. Facility to change gain adjustment, change over from depth below keel to total depth and vice versa etc., shall be provided. Alarm for shallow water depth shall be provided.

8.3 Sound Signal Generator: Ship's whistle and fog signals. Facilities shall be provided to general fog signals manually or automatically operated by own ships independently, as well as for each target separately by the instructor console. The fog signals should be interactive and the intensity and the direction at own ship station shall correspond to relative range and position of the station generating the sound signal. The fog signal shall be capable of generating the sound signals of the following:

i) vessel making way through water
ii) vessel making no way through water
iii) vessel restricted in her ability to maneuver
iv) vessel at anchor
v) vessel aground
vi) vessel not under command

8.4 Navigation lights and shapes display: Full set of navigation, Christmas tree lights and shapes shall be made available, which the own ship can select for display depending upon the prevailing circumstances.

8.5 Automated Identification System (AIS)

8.6 Day and night signalling system for fishing vessel

9. FISHING MODULE

9.1 The Fishing Simulator module should include the following principal components:

- Visualization System
- Hydrodynamic model for fishing vessels
- Hydrodynamic model for fishing gear
- Hydrodynamic model for fish shoal movement
- Models for Electronic Fishing and navigation control equipment including Radar, Echo Sounder, Sonar, Trawl Gear Control, Winch Control, GPS, Doppler Log
- Electronic chart system

9.2 Using the various integrated components of the simulation system, the Trainee should be able to:

- Maneuver the vessel into, within, and away from the fishing areas
- Maneuver the vessel to maintain safety from other vessels / objects in the fishing area

- Use data from Electronic Fishing and navigation control equipment to locate fish, shoot and haul fishing gear, maintain optimum position of fishing gear, and maintain safe distance from other vessels
- Should be able perform different types of fishing operations – Long Line, Pelagic, Purse Seine, Gillnetting (Shoot and haul)
- Respond to any emergencies created by Instructor
- Complete the objectives as set by the Instructor using specific exercises

10. Instructor: The instructor and the assessor shall be able to control and monitor simulation exercises. It should be possible to;

10.1 Start, halt, reset in time and place, and restart an exercise

Change the operating environment during the running of an exercise, viz. shall be able to alter the wind (direction and force), swell (direction and height), current (direction and rate), cloud cover, and state of visibility.

10.2 Observe and supervise the trainees

10.3 A Display (minimum 19" monitor) providing a global view of the criteria simulation scenario The display plots ship's tracks, target movements and also provides a tool for altering the parameters of the various ships.

10.4 Activate simulation of failures in real time in the following equipment:

i) Navigation lights
ii) Gyro compass including insertion of error
iii) Speed log failure or insertion of error
iv) Echo sounder
v) Radar
vi) ARPA
vii) GPS (including degrading of signal quality)
viii) Auto pilot
ix) Engine

10.5 It shall be possible to replay a full exercise showing the actions performed by the trainees.

10.6 Instructor shall be able to create exercises where one or more own ship stations can be interactive within the exercise or to be able to run them independently and in differing areas, if so required.

11. DE-BRIEFING SYSTEM

11.1 De-Briefing system shall be available on a minimum 40" display.

11.2 The instructor shall be capable of recording and saving exercises and replaying them on the computer as and when required for debriefings.

11.3 The simulator shall allow for replay of recorded exercise data in real time, fast/ slow motion and "Jump" forward/backward to any specified time.

12. Training and Support

Training should be provided by the supplier's expert(s) on operating the simulator to maximise the quality of training courses conducted using the simulator. The Training shall be conducted over a period of five days for 4 personnel after successful installation / commissioning of the simulator.

During the period of Warranty and CAMC, the seller shall arrange for a competent, experienced and responsible Technical staff on-site to carry out routine maintenance or rectify faults.

The supplier shall provide the software updates free of charge under AMC.

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