

**TENDER SPECIFICATION OF INTEGRATED PLATFORM GYRO COMPASS - BNS UMAR FAROOQ,
BNS ABU UBAIDAH AND READY STOCK**

1. **Name of the Equipment.** Integrated Platform Gyro Compass.
2. **Purpose.** The Integrated Platform Gyro Compass will be used onboard naval ships to provide necessary heading, roll, pitch and position information. The offered gyro will be interfaced with other systems of the ships by applying analog signal to the existing sending boxes for course, roll, pitch, attitude transmission and heading solid state box from the supplied Data distribution unit (DDU). In addition, to arrange digital interfacing with systems having such provisions. The gyro compasses will also have the Inertial Navigation System (INS) features which would ensure providing reasonably accurate position data of the ship even when GPS is not connected or not available due technical fault / jamming.
3. **Installation Site.** All the gyro units will be installed onboard BNS UMAR FAROOQ and BNS ABU UBAIDAH to replace the existing platform gyro compasses. In each ship, one gyro will be installed as MAIN and another gyro (ready stock/accessories) will be installed as STANDBY.

4. **Standardized Gyro Compass of BN.** BN Standardized list of Gyro Compass is as follows:

Ser	Brand	Manufacturer
1.	Sperry	Sperry Corporation, USA
2.	Sagem	Sagem, France
3.	GEM Electronica	GEM Electronica, Italy
4.	Arma Brown	Arma Brown, UK
5.	ANSYS	ANSYS, Germany

5. **Quantity** : 03 (Three) sets.
6. **Brand** : To be mentioned (within standardized Gyro Compass as per para-4)
7. **Model** : To be mentioned (within standardized Gyro Compass as per para-4)
8. **Manufacturing Country** : To be mentioned.
9. **Country of Origin** : To be mentioned.
10. **Original Equipment Manufacturer** : Name & Full address with e-mail of OEM is to be mentioned.
11. **Supplier/ Principle/ Bidder** : Name & Full Address is to be mentioned.
12. **Local Agent** : Name & Full Address is to be mentioned.
13. **Year of Manufacturing** : 2023 or later.
14. **Classification/ Standard.** The offered item is to fulfill the requirement of IEEE/ IEC/ IMO and other competent internationally recognized standards. The applicable classification standard(s) of offered items are to be mentioned and should be well supported by the certificates/ OEM brochures.
15. **Qualification of Bidder.** Manufacturer of Gyro Compass or their authorized distributor/ agent can submit quotations through their authorized local agent enlisted in DGDP. In case of offer from authorized distributor/ agent, one additional certificate is to be submitted with the offer stating that the warranty and after sales support will be provided under the full responsibility of OEM. Authorization certificates and all relevant certificates from OEM are to be submitted with the offer.
16. **Scope of Supply.** Following are to be supplied (but not limited to):
- 03 x Fiber Optic Gyro Compass with associated items/ accessories necessary for immediate operation (as per paragraph 17-27)
 - 03 x Display Unit (as per paragraph 20(b))
 - 02 x Data Distribution Unit (DDU) (as per Paragraph 20(c))

RESTRICTED

- d. 02 x Digital Tape Heading Repeater (as per paragraph 20(d))
- e. 14 x Digital Repeater (as per paragraph 20(e))
- f. 14 x Indoor and Outdoor Bearing Repeater (as per paragraph 20(f))
- g. 02 x Column repeater with column stand and dimmer (as per paragraph 20(g))
- h. 06 x Azimuth Circle (as per paragraph 20(h))
- j. 03 x AC/DC Power Supply Units (as per paragraph 20(j))
- k. 02 x Resolver Reference Power Supply Units (as per paragraph 20(k))
- l. 02 x Synchro Reference Power Supply Units (as per paragraph 20(l))
- m. 02 x Synchro Signal Amplifier (as per paragraph 20(m))
- n. Standard accessories (as per paragraph 26)
- p. Cables and Accessories Kit for System Installation (as per paragraph 20(n))
- q. Tools and Accessories (as per paragraph 20(p))
- r. Interface Control Documents (ICD) (as per paragraph 23)
- s. Integration/ Interfaces with existing systems (as per paragraph 24)
- t. Installation, Supervision, STW and Commissioning (as per paragraph 31 and 32)
- u. Test, Trial and Acceptance (as per paragraph 33)
- v. FAT, Foreign Training and Local Training (as per paragraph 27, 28, 29 and 34)
- w. Optional Spares (as per paragraph 21)
- x. Documentation and Certificates (as per paragraph 30, 36 and 37)

17. **General Features.** The offered Gyro Compass is to have the following features (but not limited to):

- a. Highly accurate real-time output for roll, pitch, LAT, Long true heading, heave, surge, sway, accelerations and rate of turn, even within GPS/GNSS denied environments
- b. Ease-of-use and integration
- c. Robust heading performance for high-speed vessels with high rate-of-turn
- d. Fiber-Optic Gyroscope, solid-state and strap-down technology

18. **Environmental Condition and Other Standard.** The requirement features are as follows:

- a. Temperature : 0°C to 55°C.
- b. Relative Humidity : Up to 95% (non condensing).
- d. For Vibration : IEC-60945 or equivalent (To be mentioned).
- e. Sea Keeping : To comply with the ship's movement as follows:
 - (1) Roll : $\pm 30^{\circ}$.
 - (2) Pitch : $\pm 10^{\circ}$.
 - (3) Yaw : $\pm 8^{\circ}$.
- f. EMI/EMC : IEC 60945 or equivalent (To be mentioned).

19. **System Composition.** A generic block diagram of the system composition is attached as enclosure. In general, the system should be comprise of the followings:

- a. **Master Inertial Sensor.** At the core of the system lies a fiber-optic gyrocompass inertial navigation sensor, which should serve as the primary source for platform attitude and motion reference. This sensor is notable for its potential high accuracy, reliability, and the advantage of being maintenance-free due to the absence of moving parts.
- b. **Command and Control Display Unit.** A dedicated interface is included for the visualization of gyro data, such as platform attitude and motion metrics. This unit shall allow for the modification of gyro settings and shall provide alerts for system failures, ensuring operational integrity.
- c. **Data Distribution Unit.** A specialized unit, customized for the system, is responsible for converting and distributing gyro output data. It may handle various data formats, including NMEA, Synchro, and Resolver, to meet technical requirements. This unit shall also distribute NMEA serials to onboard receivers and repeaters, with capabilities for data conversion as per specific operational needs.
- d. **Synchro and Resolver Data Handling.** Components for amplifying Synchro data outputs for future applications and sending Resolver data to existing systems are included. These components should ensure the provision of accurate course, roll, and pitch information under diverse conditions.
- e. **Inertial Navigation System (INS) Capability.** The system should offer geographic positioning independently of external inputs like GPS/GNSS, providing a reliable navigation solution in scenarios where GPS/GNSS is unavailable, jammed, or failed. This feature should guarantee continuous and safe navigation operations.

20. Technical Specification.

- a. **Fiber Optic Gyro Compass.** The detail requirement of general features are as follows:

Ser	Description	Remarks
1.	Heading Accuracy	$\leq 0.1^\circ$ sec (Lat) RMS
2.	Roll/Pitch Accuracy	$\leq 0.01^\circ$ RMS
3.	Full accuracy settling time (all conditions)	≤ 10 min (static) ≤ 30 min (full accuracy, all conditions)
4.	Range	0° to 360° (Heading) $+60^\circ$ (for Roll/Pitch)
5.	MTBF	≥ 150000 hours
6.	(1) Input & output serial	RS422
	(2) Signal input rate (user designed)	Up to 10 Hz
	(3) Output Rate	0.25 Hz to 10 Hz (user-defined) (To be mentioned)
	(4) Signal input protocol	0183, IEC-61162
	(5) Signal output protocol	Over designed IEC-61162, Binary
	(6) Position accuracy INS	≤ 3 m CEP (Considering GPS signal) ≤ 1 NM/12h CEP (Considering log aiding) ≤ 2 NM/12h CEP (Full inertial)
	(7) Signal input baud rate (user designed)	Up to 460800 bps
	(8) Signal in Output baud rate (user designed)	From 4800 bps, Up to 460800 bps

- b. **Display Unit.** Display unit details are as follows:

Ser	Description	Remarks
1.	Model	To be mentioned
2.	Year of Manufacturing	2023 or later
3.	Display Size	To be mentioned

4.	Display Colour	256 (To be mentioned)
5.	Display Type	TFT/LCD/LED (To be mentioned)
6.	Resolution	VGA or better (To be mentioned)
7.	Weight	To be mentioned

c. DDU.

Ser	Description		Remarks
1.	Model		To be mentioned
2.	Quantity		As per article 16c
3.	Year of Manufacturing		2023 or later
4.	Ingress Protection (IP)		To be mentioned
5.	Dimension		To be mentioned
6.	Weight		To be mentioned
7.	Power Supply Input		110V,400Hz Synchro Reference Voltage, 36V,400Hz Resolver Reference Voltage. Converters should be capable of receiving reference voltage from external power source.
8.	Gyro Data Input		DDU should receive gyro data from both the gyro. It should be capable of operating with any one gyro. When both gyro are running simultaneously, it should be able to switch over manually and automatically to one another as per the requirement and also in case of failure.
9.	Output	Digital Synchro Converter to	110V, 400Hz, featuring a speed ratio of Coarse 1:1 and Fine 36:1
		Digital Resolver Converter to	36V, 400Hz, featuring a speed ratio of Coarse 1:1 and Fine 16:1 should be capable of driving existing resolvers in course, roll, pitch, attitude and heading solid state sending box.
		Digital	a. Data Type: NMEA 0183 b. No of port: Required for all the repeaters, navigational systems, new systems having digital interface and few for future use
10.	Port		RS422
11.	Accuracy		To be mentioned
12.	Other Major Features		Details to be mentioned

d. Digital Tape Heading Repeater. Detail requirement of digital heading repeater are as follows:

Ser	Description	Remarks
1.	Model	To be mentioned
2.	Year of Manufacturing	2023 or later
3.	Quantity	As per article 16d
4.	Performance	(+/-) 0.1 Resolution
5.	Follow up rate	10 degree per second
6.	Resolution	1,5 and 10 degree
7.	Power supply	To be mentioned
8.	Ingress Protection (IP)	IP56 or better (To be mentioned)
9.	Dimension	To be mentioned
10.	Weight	To be mentioned
11.	Mounting	Bulkhead
12.	Other Major Features	Details to be mentioned

- e. Digital Repeater. Detail requirement of digital repeater are as follows:

Ser	Description	Remarks
1.	Model	To be mentioned
2.	Year of Manufacturing	2023 or later
3.	Ingress Protection (IP)	IP56 or better (To be mentioned)
4.	Dimension	To be mentioned
5.	Weight	To be mentioned
6.	Other Major Features	Details to be mentioned

- f. Indoor & Outdoor Bearing Repeater. The detail requirement of bearing repeater are as follows:

Ser	Description	Remarks
1.	Model	Digital Auto Rephrasing Course and Bearing
2.	Quantity	As per article 16f
3.	Year of Manufacturing	2023 or later
4.	Ingress Protection (IP)	For Bearing repeater: IP56 or better (To be mentioned) For Course repeater: IP40 or better (To be mentioned)
5.	Dimension	To be mentioned
6.	Weight	To be mentioned
7.	Interface	RS422, NMEA 0183
8.	Baud Rate	4800 bps
9.	Resolution	0.1°
10.	Accuracy	±0.025°
11.	Other Major Features	Details to be mentioned

- g. Column repeater with column stand and dimmer. The detail requirement of column repeater with column stand and dimmer are as follows:

Ser	Description	Remarks
1.	Model	To be mentioned
2.	Quantity	As per article 16g
3.	Year of Manufacturing	2023 or later
4.	Ingress Protection (IP)	IP56 or better (To be mentioned)
5.	Power Supply	To be mentioned
6.	Dimension	To be mentioned
7.	Weight	To be mentioned
8.	Interface	RS422, NMEA 0183
9.	Baud Rate	4800 bps
10.	Resolution	0.1°
11.	Accuracy	±0.025°
12.	Other Major Features	Details to be mentioned

- h. Azimuth Circle. Details of Azimuth Circle are as follows:

Ser	Description	Remarks
1.	Brand	To be mentioned
2.	Model	To be mentioned
3.	Quantity	As per article 16h (4 x Azimuth Circle for Indoor & Outdoor Bearing repeater 2 x Azimuth Circle for Column repeater)
4.	Year of Manufacturing	2023 or later

- j. Power Supply Unit (PSU). Details of Power Supply Unit (PSU) are as follows:

Ser	Description	Remarks
1.	Brand	To be mentioned
2.	Model	To be mentioned
3.	Year of Manufacturing	2023 or later
4.	Input	To be mentioned
5.	Output	To be mentioned

- k. Resolver Reference Power Supply Unit. The detail requirement of Resolver Reference Power Supply Unit is as follows:

Ser	Description	Remarks
1.	Model	To be mentioned
2.	Quantity	As per article 16k
3.	Year of Manufacturing	2023 or later
4.	Ingress Protection (IP)	To be mentioned
5.	Dimension	To be mentioned
6.	Weight	To be mentioned
7.	Input	220V AC
8.	Output	36V, 400Hz
9.	Accuracy	To be mentioned
10.	Capacity	To be mentioned (As per requirement of existing system)
11.	Other Major Features	Details to be mentioned

- l. Synchro Reference Power Supply Unit. The detail requirement of Synchro Reference Power Supply Unit is as follows:

Ser	Description	Remarks
1.	Model	To be mentioned
2.	Quantity	As per article 16l
3.	Year of Manufacturing	2023 or later
4.	Ingress Protection (IP)	To be mentioned
5.	Dimension	To be mentioned
6.	Weight	To be mentioned
7.	Input	220V AC
8.	Output	110V, 400Hz
9.	Accuracy	To be mentioned
10.	Capacity	To be mentioned (As per requirement of existing system)
11.	Other Major Features	Details to be mentioned

- m. Synchro Signal Amplifier. Detail requirement of Synchro Signal Amplifier are as follows:

Ser	Description	Remarks
1.	Model	To be mentioned
2.	Year of Manufacturing	2023 or later
3.	Ingress Protection (IP)	IP56 or better (To be mentioned)
4.	Dimension	To be mentioned
5.	Weight	To be mentioned
6.	Other Major Features	Details to be mentioned
7.	Number of output	Minimum three per axis

- n. Cables and Accessories Kit for System Installation. Technical specification of Cables and Accessories Kit for System Installation is as follows:

RESTRICTED

Ser	Description	Remarks
1.	Brand	To be mentioned
2.	Model	To be mentioned
3.	Country of Origin	To be mentioned
4.	Country of Manufacturer	To be mentioned
5.	The requirement of cables is to be assessed by the supplier through ship visit and to be submitted with the offer. Supplier will meet additional requirement of cables during installation if it is necessary to follow the existing cable path and route. Details of various cable specification are to be provided.	

p. **Tools and Accessories.** The supplier is to provide necessary tools and accessories with the gyro. In this regard, a list of tools and accessories are to be quoted with the offer mentioning item-wise price.

21. **Optional Spares.** List of the following optional spares are to be quoted separately mentioned items wise price. Buyer may select the spares as required from the list for procurement:

Ser	Name of Item	Qty	Remarks
1.	Power Supply Unit	01	
2.	Synchro Reference Power Supply Unit	01	
3.	Resolver Reference Power Supply Unit	01	
4.	Touch Screen LCD Display Unit	01	
5.	Synchro Signal Amplifier	01	
6.	Resolver Converter PCB of DDU	01	

22. **Power Supply Available at Ship.** The power supply available at ship is 380V \pm 5%, 50Hz, 3 Phase and 220V \pm 5%, 50Hz, single Phase. Any other power supply unit (if necessary) is to be provided by the Supplier.

23. **ICD and IRS.** The Supplier shall provide necessary Interface Control Document (ICD), Interface Requirement Specifications (IRS) and interface protocol during delivery/ installation of the items. The ICD, IRS and interface protocol will be utilized by BN to integrate any sub-systems in future (if needed). The supplied ICD and IRS will be tested and demonstrated in the presence of buyer's representative during installation by qualified OEM Engineer. A job completion report/ certificate is also to be signed by both parties in this regard. The cost of ICD and IRS is to be quoted separately in the offer.

24. **Integration/ Interfaces Requirement.** The gyro will be interfaced with the shipbored equipment/ system. The cost of interfacing and integration is to be quoted separately by bidder.

a. **Present Integration/ Interfaces Requirement.** The items are as follows:

Ser	Description	BN Ship 1 (UF)	BN Ship 2 (AU)
1.	ECDIS	Brand: TRANSAS Model: Navi Sailor 4000	Brand: JRC Model: NWZ-170-E
2.	Navigation Radar	GEM SeaEagle- 200 N/6	
3.	Helo Control Radar	GEM HASR- 100	
4.	Anemometer	Walker 5002	
5.	GPS	Furuno GP 150	

b. **Future Integration/ Interfaces Requirement.** The items are as follows:

Ser	Description	BN Ship 1 (UF)	BN Ship 2 (AU)
1.	Western Origin Navigational Radar and Other equipment/	Bidder has to ensure the online assistance support from OEM during any interfacing/ integration of supplied gyro with onboard any western origin equipment and system including BN TDL (TecnoBit,	



	system	Spain, Model: Bangla-22) and IFF system in future (Whenever requested by BN not exceeding 05 years from the date of acceptance) without any additional cost. In this regard, necessary assurance certificate is to provided by bidder from OEM with offer.
2.	EM Log	Walker 7070 MK-2 (after it is installed onboard)

25. **Interfacing Responsibility.** The requirement of interfacing responsibility is stated as follows:

a. **OEM Responsibility.**

(1) **Ensure Functionality of Sending Boxes.** The OEM shall ensure the proper driving of the sending boxes for Course, Roll, and Pitch, Attitude Transmission Box and Heading Solid State Box. The functioning of above said units will not be the responsibility of supplier/OEM.

(2) **Provision of Protocols and ICD.** The OEM must provide all necessary protocols and Interface Control Documents (ICD) to facilitate the interfacing of the gyro system with other sensors or systems during installation, ensuring compatibility and functionality as per paragraph 23.

(3) **Testing and Demonstration.** The OEM is responsible for testing and demonstrating the interfacing as per specific requirements, confirming that the gyro system works seamlessly with the ship's existing configuration upto various sending boxes.

(4) **Online Assistance for Interfacing Issues.** In case of any complications with the interfacing of the supplied gyro within five years from acceptance, the OEM must provide expert online assistance without additional costs, which shall be assured by an online assistance assurance certificate.

(5) **Interfacing with Existing Resolver Receiver.** The OEM has full responsibility for interfacing with the ship's existing resolver receivers, including conducting onboard investigations to determine the actual power output required for synchro-resolvers of various sending boxes.

b. **BN Responsibility.**

(1) **Interfacing with Ship's Existing Equipment.** Bangladesh Navy (BN) would be responsible for the interfacing of the gyro system with the ship's existing equipment. However, such interfacing work will be assisted by supervision of OEM.

(2) **Implementation of Protocols and ICD.** While the OEM supplies the necessary protocols and ICD, BN will use it for interfacing with other sensors or systems.

(3) **System Functionality Testing.** Post-installation, BN shall complete the testing of the system's interfacing. However, OEM may assist BN while doing/troubleshooting such activities.

26. **Standard Accessories.** Standard accessories must include every item and accessories, which are essential to make the offered Gyro operational with full functionality, whether those are mentioned in the specification or not are to be supplied by the bidder within the scope of the supply. Any such accessories, kit and associated items except followings are to operate the said equipment in full functionality to be mentioned clearly with purpose and submit with offer mentioning item wise price:

Ser	Name of Item	Qty	Remarks
1.	Muster Unit and display unit including base plate and fixing	01	

2.	Power Supply Unit	01	
3.	Touch screen LCD Display Unit	01	

27. **Factory Acceptance Test (FAT).** Following FAT is to be carryout in OEM premises for the offered equipment:

a. FAT will be carried out by a team of 03 (Three) BN members for duration of 05 (Five) working days in OEM premises at the buyer's expense. Both way air fare, accommodation and food for the FAT team will be borne by BN. All types of movement/ transportation (air/sea/road) of the team within the manufacturer's country, reception and arrangement for entry into the country/ concerned area for the FAT are to be arranged by the supplier. The item-wise cost in this respect is to be quoted in the offer. The supplier should inform the buyer about the date of FAT (schedule) and FAT criteria at least 08 (Eight) weeks prior to the date of FAT. FAT procedure shall be forwarded to the buyer 08(Eight) weeks prior to the date of commencement of the FAT to the concerned directorate for approval of BN.

b. On return from the country of manufacturer, the FAT team will submit the report to concerned Directorate at Naval Headquarters. Naval Headquarters will, forward final decision along with FAT report, basing on which DGDP will render clearance for shipment of stores to the supplier concerned. The supplier will not make shipment of any item of the contract without clearance from DGDP.

c. The objective of FAT will be to check the capability of the system as per the technical specification mentioned in the offer. The FAT will be carried out at manufacture's factory premises. In this regard, the FAT protocol is to be submitted for approval by BN well in advance.

d. During FAT, various tests for checking performance are to be carried out and recorded. After FAT, a joint test report will be prepared and signed by both the seller and buyer's representative.

e. **Country and Location of FAT.** Details are to be mentioned.

28. **Foreign Training.** The objective of foreign training at OEM premises is to develop compatible maintainer on the system. The supplier will provide maintainers training to the nominated BN personnel at manufacturer's premises. Cost of both way air fare (Dhaka to manufacturer's premises and back) will be borne by the purchaser. Food, accommodation, training material and internal travel cost will be arranged by the supplier. The supplier is to quote the price of foreign training separately mentioning cost per trainees per day. Training shall be provided in English Language as per the duration below:

Ser	Training	Remarks
1.	04 (Four) BN personnel will be trained for a duration of 10 working days regarding maintenance of the offered system.	The training should include 1 st and 2 nd level maintenance and interfacing aspect of the system in details, including software aspect. The details of training syllabus is to be provided with the offer. Training contents are to be provided 06 (Six) weeks prior to the said maintainer training

29. **Training Contents.** The objective of the training should include flowing but not limited to:

a. BN personnel should have comprehensive knowledge on system overview and its features and limitations. They should also acquire detailed knowledge and orientation with sub systems.

b. BN Personnel should be totally oriented and skilled for the operation of the Gyro compass system including various software functions and applications.

- c. Trainees should know which level of maintenance they can do, what kind of tools and skill needs to be used to carry out maintenance works as per OEM recommended maintenance system/schedule.
- d. BN personnel should be completely aware of all hardware/ software including all kinds documentations related to the system.
- e. There should be a standard operating procedure for a small ready response team to address problems.
- f. Trainees should be able to un-install, install, set to work, configure, interface the whole system including all software used in the system.
- g. Trainees should be able to do alignment, calibration, testing, tuning and software based system check etc of the offered Gyro compass system.
- h. Lectures and training should focus on the following:
 - (1) System Overview and system configuration.
 - (2) System operation covering all functions of Gyro compass system.
 - (3) Details about System architecture.
 - (4) Lessons on ICDs (consisting communication type, NMEA standard, message format, data structure and etc).
 - (5) Hardware and software and their function, troubleshooting, backup software, system restoration (if crashed) etc.
 - (6) Familiarization of manuals, publications and document which are to be provided.
 - (7) Network Configuration and troubleshooting.
 - (8) Repair and maintenance.
 - (9) Fault finding and understanding error message.

30. **Manuals/ Documents.** 03 (Three) sets of following documents and manuals in English are to be provided at free of cost at the time of delivery:

- a. Operating Manual
- b. Technical Manual with Circuit Diagram (At least upto SRU/ module level)
- c. Maintenance Manual
- d. Parts Catalogue with Parts Identification List (PIL)
- e. Installation Manual having Layout drawing of equipment, alignment instruction, electrical interconnection diagram, cable diagram, diagram showing interface (mechanical and electrical) and data protocol.

31. **Installation, Supervision, Setting to Work (STW) and Commissioning**

- a. All the offered Gyros are to be installed onboard ships by replacing the existing Gyro and to be commissioned by the OEM engineer in presence of BN personnel. Installation includes STW, HAT & SAT of associated equipment, test/ trial at harbour and at sea.
- b. The supplier at no additional cost will do any modification/ alteration required to install the set. The supplier has to mention in the offer **whether docking of ship will be required for said installation work.**
- c. Bidder has to submit online assistance assurance certificate from OEM (Whenever requested by BN not exceeding 05 years from the date of acceptance) without any additional cost

RESTRICTED

with offer for future interfacing and integration issue of onboard any equipment and system with supplied gyro.

d. BN will provide available welding, cutting, drilling and paneling work for equipment installation. In this regard, qualified manufacture's engineer is to supervise the work.

e. Qualified manufacture engineer(s) is to be employed for the installation and STW. All expenses for food, accommodation, airfare and internal travel etc for OEM engineers is to be borne by the supplier.

f. Cost of installation works, Supervision, STW and Commissioning are to be quoted separately.

g. Any damage to onboard existing systems, items, equipment and machineries due to cable laying and installation of supplied Gyro shall be compensated by supplier to make damage items operational.

32. **Installation Materials.** All Installation materials, like junction's boxes, brackets, nuts, bolts, securing tie clips, slips, channels (not limited to) are to be provided by the supplier. **Bidder may visit the installation site prior submitting the offer.**

33. **Test, Trial and Acceptance**

a. 02 (Two) sets of gyro compass are to be installed onboard ships as main gyro and the remaining 02 (Two) sets gyro from the ready stock and standard accessories are to be installed as stand by or redundant.

b. The OEM engineer will ensure satisfactory tests, trial and functioning/ commissioning of the equipment at purchaser's premises after all necessary integration/ interfacing with other systems.

c. **HAT.** Harbour Acceptance Test (HAT) will be carried out at harbour on completion of setting to work (STW).

d. **SAT.** Sea Acceptance Test (SAT) will be carried out at sea on completion of satisfactory HAT.

e. **HAT and SAT Protocol.** The HAT and SAT protocol/ procedures is to be approved by BN at least 06 (Six) weeks prior to commencement of individual schedule.

f. **Acceptance.** On completion of satisfactory Test/ Trial (HAT and SAT), an acceptance certificate will be signed by BN and Supplier.

34. **Local Training.** The manufacturer is to send one engineer who will provide onboard operation and maintenance training to BN personnel for duration of 05 (Five) working days after test, trial and commissioning of each set. During training, emphasis is to be given on operation, maintenance and fault finding of Gyro Compass. Cost of airfare (to and from Bangladesh), accommodation, food and internal transportation (to and from work site and hotel) of the manufacturer's engineer is to be borne by the supplier. Cost of onboard training is to be quoted separately. A set of detail training content is to be provided by bidder to BN 02 (Two) weeks prior to the said training. The training should include (but not limited to) the following:

- a. System composition, configuration, principle of operation and troubleshooting.
- b. Software installation, operation and configuration for smooth conducting of all the tests.
- c. Theoretical concept and procedure of tests (practical).
- d. Repair and maintenance.
- f. ICD details for futures BN utilization.

35. **Technical Support.** Technical support is to be provided to solve any maintenance and operational problem arising with the item within the warranty period. An assurance agreement in this respect is to be submitted with the offer.
36. **Quality Assurance Certificate (QAC).** The Quality Assurance Certificate (QAC) in respect of manufacturing and performance of the offered equipment is to be provided by the manufacturer at the time of delivery.
37. **Certificate.** The bidder shall provide following certificates:
- Manufacturer's Authorization Certificate with the offer.
 - Pre-delivery Inspection Certificate (in English) is to be provided by the supplier 02 weeks prior to shipment.
 - Guarantee and warranty certificates with the offer and at the time of delivery.
 - Quality Assurance Certificate (QAC) at the time of delivery.
 - After sales service support certificate from OEM with offer.
 - Online assistance assurance certificate from OEM with offer.
38. **Guarantee of Supply of Spares.** The supplier is to give guarantee for the continued supply of spares for the offered Gyro for at least 05 (Five) years from the date of delivery of the item at a reasonable price. A list of such spares with item-wise price is to be provided.
39. **Price.** Price of the each item of the total offer is to be shown separately (e.g. price of the main items, additional and optional items, spares, installation and STW, FAT, training, Warranty/ Guarantee etc) and then grand total of the foreign currency to be shown on the original offer submitted by the bidder.
40. **Warranty.**
- 12 (Twelve) months manufacturer's warranty for trouble free operation is to be provided for the item from the date of acceptance by the buyer. If any component and submit of the supplied items becomes defective during the warranty period, the overall warranty shall be extended automatically for the period of subject component remains defective.
 - For warranty repair/ replacement, the supplier will collect the defective item (portable) from NSD, Chittagong/ NSSD, Dhaka (as applicable) and re-supply the same to collecting place after warranty repair or for replacement within 90 (ninety) days from the date of defect at no cost to the purchaser.
41. **Shipment & Delivery.**
- The supplied items are to be delivered within **09 (Nine) months** after signing the contract to the following Consignee:

<p>The Commanding Officer Naval Stores Depot New Mooring, Chittagong, Bangladesh BIN-002349278-0503</p>	<p>or Officer In Charge Naval Stores Sub Depot Dhaka Naval Unit Khilkhet Namapara, Dhaka-1229, Bangladesh</p>
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 - Place of Delivery:** NSD, Chittagong.
 - Incase of CFR, the supplier will carry the items from sea port/ air port (as applicable) to NSD Chittagong.
 - Port of shipment:** The Port of shipment is to be from the country of manufacturer or country of origin (to be mentioned).

42. **Source of supply.** The Source of supply is to be from the country of manufacturer or country of origin (to be mentioned).
43. **Brochures/ Booklet.** One set of original brochures/ booklets in English having detailed technical information including pictures of different parts of the equipment, system connection diagram etc, about the offered item is to be provided along with the offer.
44. **Ship Visit and System Study.** Prospective bidder may visit the installation site (BNS UMAR FAROOQ and BNS ABU UBAIDAH at Khulna Naval Area) to estimate installation materials and works involved in installation works before submission of offer to avoid any difficulties/ confusion after placing order. Site survey report has to be submitted by the bidder with offer, stating the requirement of installation materials, Cables and other installation item requirement. Bidder may send application to BN through DGDP for security clearance 06 (Six) weeks prior to said site survey.
45. **Validity.** The offer should remain valid up to **30 June 2024.**
46. **User List.** List of users of the offered Gyro sets is to be mentioned with full address. The list shall provide the name of various users with respective model and brand of the system. The offered system should be widely used by various users. The user list will be used for the assessment of the offer.
47. **Terms of Payment.** Letter of Credit will be opened for full amount of contract price in favour of the supplier/ Principal for the complete scope of supply with the following terms of payment:
- 80% of contract price (excluding training, FAT and installation cost) will be released after shipment of all items and on submission of necessary documents as per DGDP rules.
 - The remaining 20% of contract price of **each set** (excluding training, FAT and installation cost) will be released after successful test/ trial, jointly carried out by the buyer's representative and supplier's engineer and final acceptance of the Gyro compass by the purchaser.
 - 100% cost of each training, FAT and installation will be released upon completion of respective activities and upon submission of each completion certificate.
48. **Compliance Statement.** A compliance statement fulfilling all the requirement of the tender is to be submitted for evaluation of the quotations. Stating mere 'Yes or No' will not suffice and detailed evidences with description/ information, brochures/ booklet, drawing and diagram as required is to be given. An incomplete compliance statement may attribute to cancellation of the offer. If any clause of this specification does not commensurate with offered Gyro sets, the deviation has to be spelled out clearly.