

Date: 15.01.2026

**CORRIGENDUM NO: 2**

**Ref.** HCSL/PUR/TEN/2026/005, Dated: 07.01.2026.

**Sub:** Revised Purchase Technical Specification (PTS)

**TENDER FOR:** "Design, Manufacturing, Supply and Commissioning of complete CO2 Fixed Fire Extinguishing System as a package in Cargo Hold, Engine Room and Emergency DG Room of 2200T MPV at Hooghly Cochin Shipyard Limited, Nazirgunge Unit, Howrah."

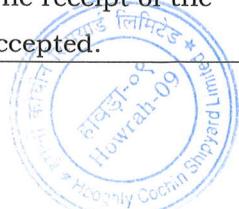
1. The revised **Purchase Technical Specification (PTS)** is enclosed herewith.
2. The earlier PTS stands superseded. Bidders shall refer only to the revised PTS.
3. The last date of submission of tender is 21/01/2026 at 15:00 hrs.
4. The date of opening of tender will be at 15:30 hrs on 21/01/2026.
5. All other term and conditions shall remain unaltered.

For Hooghly Cochin Shipyard Limited



Rev. No.	Pages	Description	Date	Sign.
0	07	FIRST ISSUE	26-11-25	Rakesh
1	11	Co2 requirement for Emergency DG Room is removed. Fixed Co2 required for ER & CH Only	14-01-26	Rakesh

 HOOGHLY COCHIN SHIPYARD LIMITED		<b>HOOGHLY COCHIN SHIPYARD LIMITED</b> <b>HOWRAH - 711 109</b>												
YARD NO		00422004	<b>PROJECT: 2200MT MULTIPURPOSE VESSEL</b>											
OWNER		JAK MARITIME & LOGISTICS INDIA PVT. LTD.	<b>PURCHASE TECHNICAL SPECIFICATION FOR CO2 FIXED FIREFIGHTING SYSTEM IN CARGO HOLD AND ENGINE ROOM.</b>											
APPROVED		ARAVIND DOSS												
CHECKED		ANENTHU S												
PREPARED		RAKESH SAGAR												
DATE		26-11-2025	SCALE: - NA		Doc. No.: PTS-00422004-015									
ISSUED TO	NO. DEP													
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## Table of Contents

1. General Specifications .....	3-6
2. Technical Specifications .....	7



## **SECTION A – GENERAL SPECIFICATIONS**

### **1) Introduction**

This document indents to offload the design, approval (From IRS), manufacturing, supply and commissioning of complete **CO<sub>2</sub> Fixed Fire Extinguishing System** as a package. Installation of Co<sub>2</sub> system will be carried out by Yard as per recommendation/Guidance from supplier. All required accessories for the above systems also to be included in the scope of supply.

### **2) Name & Quantity**

**CO<sub>2</sub> Fixed Fire Extinguishing System : 1 Set.**

### **3) Particulars of the vessel**

The principal design characteristics of the vessel shall be as follows:

Length overall	:	abt. 78.00 m
Breadth (moulded)	:	abt. 16.00 m
Depth (moulded)	:	abt. 5.50 m
Draft (Max.)	:	abt. 3.50 m
Gross tonnage	:	~ 2200

### **4) Class & Flag Rules:**

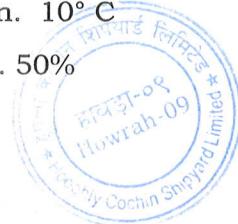
The vessels shall be built under the following flag and classifications:

Flag	:	India
Classification	:	Indian Register of Shipping.
Class notation	:	✠ SUL, BULK CARRIER(BC-XII), CARGO HOLD STRENGTHENED FOR CARRIAGE OF STEEL COILS (MAXIMUM WEIGHT OF ONE COIL..... (T)), EQUIPPED FOR CARRIAGE OF CONTAINERS ✠ IY

### **5) Design Conditions**

The following ambient conditions shall be considered for the selection of the Vessel's equipment and machinery. Machinery shall be able to deliver its specified output and operate satisfactorily under tropical conditions as mentioned below:

Sea water temperature	:	max. 32° C min. 5° C
Air temperature outside	:	max. 40° C min. 10° C
Relative Humidity	:	max. 90% min. 50%



Engine Room temperature : 35° C

List, rolling, trim and pitch according to limits as per Class.

Above requirements to be considered as minimum, any other requirements which are necessary to meet class/IMO/flag rules/regulations shall be considered for design and operation of the equipment.

### **Electric Power Supply:**

The Electric Power supply available onboard is

415V AC, 50 Hz, 3Φ, 3 wire.

230V AC, 50 Hz, 3Φ, 3 wire / 1Φ, 2wire 24V DC

Any other voltage other than above should be derived by the firm by using necessary built-in arrangement. All type of power supplies requirements with number of feeders and power rating are to be listed out in the offer.

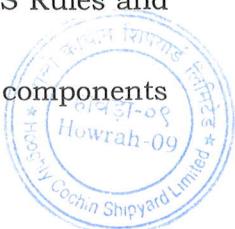
### **6) Rules and Regulations**

The vessel shall be built in compliance with all relevant International Standards as applicable at the time of construction, including (but not limited to) the following. Exemptions on any requirements of these regulations, as deemed necessary considering the operational needs of the vessel are to be obtained from relevant Authorities/Class:

- a) Merchant Shipping Rules 2016
- b) Load Lines, 1966/1988 - International Convention on Load Lines, 1966, as Amended by the Protocol of 1988
- c) International Convention of the Safety of Life at Sea (SOLAS)
- d) COLREGS - International Regulations for Preventing Collisions at Sea
- e) MARPOL - International Convention for the Prevention of Pollution from Ships
- f) Tonnage - International Convention on Tonnage Measurement of Ships, 1969
- g) 2008 IS Code – International Code on Intact Stability, 2008
- h) International Labour Conference – Maritime Labour Convention, 2006
- i) IMO regulations MSC.337 (91) for Noise and Vibration.
- j) International Convention on the Control of Harmful Anti-Fouling Systems on Ships, 2001

### **7) Certification, Testing and Inspection**

- a) All certificates as required by the class, rules& regulation shall be provided.
- b) Manufacturer's shop tests and inspection shall be carried out in accordance with the manufacturer's standard and the requirements of the IRS Rules and Regulations and the test results and certificates shall be supplied.
- c) The following general principle shall be followed for certification of components



and equipment:

- i. For the Components and Equipment requiring Type Approval Certificate as per rules & regulations, (Type Approval Certification from any IACS member is acceptable).
- ii. For Components and Equipment requiring product certification and are produced outside India, certificate from any IACS member is required. IRS will send formal authorization to IACS to conduct inspection and issue certification on behalf of them. However, IRS will retain the option to attend test and trials at manufacturing facility.
- iii. For all Class items manufactured in India, certificate from IRS is required.

d) All necessary documentations/drawings and calculation complying the above rules shall be submitted to & IRS by the firm for approval. Suppliers are requested to consider/include drawing approval from classification society (IRS) under their scope of supply.

e) After installation and commissioning, tests / trials shall be carried out as per manufacturer's standard practice and to the satisfaction of Classification societies / other statutory requirements. Any faults found at this stage, shall be corrected to the satisfaction of all related parties before the delivery of the ship.

f) All certificates required by the Class; Rules & Regulation shall be provided.

g) Supplier to confirm & clearly mention any deviation with the testing & inspection requirement in the offer.

## **8) Supply of Documents**

All documents shall be in English and in SI unit system and the following documents shall be submitted, where applicable. The drawing approval where required by the Classification Society shall be obtained by the manufacturer.

### **9.1. Documents to be submitted along with offer**

- a. Technical offer containing the list of items required for functioning of the system.
- b. List of items quoted including service during installation & commissioning.
- c. Calculation of cylinder capacity
- d. Technical datasheet for major items of the system.
- e. P&ID of the complete system indicating yard& OEM scope of supply
- f. Dimensional drawing, weight details and C.G of cylinders and other major components of the system.
- g. Preliminary list of alarms and instrumentation.
- h. List of spares / tools as required by class& manufacturer (if any).
- i. List of items if any, not covered in supplier's scope of supply.

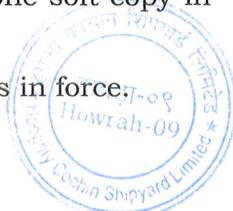


9.2. Documents to be submitted within **10 working days** after placement of Order/LOI/As per final agreement

- a. Detailed Bill of Material.
- b. CO<sub>2</sub> Room Arrangement along with dimensions showing maintenance space required around the equipment in Auto CAD/Dxf format.
- c. Mounting arrangement drawing and fasteners details.
- d. Installation and commissioning details.
- e. Technical datasheet of each individual components containing model no., type, capacity, electrical details, power required, material of construction etc.
- f. Hydraulic calculations of pipe routing.
- g. Lifting Arrangements.
- h. Project specific P&D of the complete system.
- i. Weight and CG details of each item in the system.
- j. Compressed air/ other ship's system requirements for the operation of the system if any.
- k. Heat dissipation details.
- l. End connection details indicating standard, size and location of connections.
- m. Electrical schematic system diagrams, internal wiring diagram with terminal numbers marked.
- n. Wiring diagram and connection diagram of whole system including all junction boxes, starter panels, control panel etc with cable details.
- o. Cable included in the scope along with Yard cables to be clearly indicated.
- p. Detailed definition of all terminal points and interfaces.
- q. Operation, Installation, Maintenance and Troubleshooting Manual.
- r. Details of shop tests and inspection for all items.
- s. List of spares / tools as agreed.

9.3. Documents to be submitted along with delivery of Machinery and/or Equipment to the Yard (4 sets / vessel unless otherwise mentioned)

- a. IRS Certificate /Documents.
- b. Type approval certificates for valves, hoses nozzles, cylinders etc., as applicable.
- c. Manufacturers Test certificate as applicable (3 copies/vessel with original)
- d. Test and inspection results of components in the system.
- e. Packing list (with reference to each item of Bill of Materials)
- f. Installation, Operation, Maintenance manuals (3 sets and one soft copy in CD)
- g. Any other certificate required as per international regulations in force.



## **1. General Remarks**

### **a) Name Plate (s)/Caution Plate (s) and Instrumentation**

The name plate(s) and caution plate (s) shall be written in English indicated in SI unit. All major machinery, electrical and equipment shall be provided with identification nameplates made from stainless steel/brass plates as per manufacturer's standard and label plates indicating equipment type, capacity, electric rating etc. shall be fitted as per manufacturer's standard. Instrumentation shall also be indicated in SI unit.

### **b) Liability**

Manufacturer shall bear all responsibilities for the shop trials and the delivery of the machinery or equipment.

### **c) All parts / components, valves and pipes/fittings necessary for the operation of the system to be included in the scope of supply. Pipes after the manifold will be under yard's scope.**

### **d) Piping Flange**

Piping end connection shall be as per EN1092-1 Type 01 PN10 / PN16 Flat Face as applicable. If there is any deviation with the standard mentioned above, then mating flanges shall be supplied for all end connections by the firm.

### **e) Screw Thread**

Screw thread if any, shall be in accordance with ISO standard.

### **f) Grease Nipple**

Pin type grease nipple, where grease is supplied shall be used.

### **g) Painting**

Painting schedule shall be as per manufacturer's standard and the painting scheme shall be specified.

### **h) Preservation**

Recommended method of preservation and names of recommended preservatives shall be indicated. Maximum R.H. (Relative Humidity) at Howrah in West Bengal is around 80% and minimum R.H is at around 60%.

### **i) Special Tools**

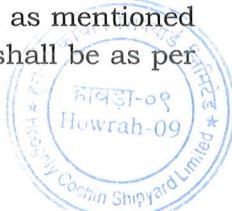
Special tools if any required for installation have to be supplied with the equipment.

### **j) Instruments**

All necessary instruments to be supplied by the firm.

## **2. Guarantee**

The equipment and accessories shall be guaranteed against defective design, material and workmanship and under performance till, for a period as mentioned in commercial terms and conditions. Guarantee of the equipment shall be as per commercial terms and conditions.



## **SECTION B – TECHNICAL SPECIFICATIONS**

### **1. General Requirements**

- a) The system and its accessories must be suitable for marine applications and function smoothly at design and environmental conditions mentioned in section A of this document, without any undue effect.
- b) It should withstand air contamination through oil, salt and other contaminants associated with the marine environment.

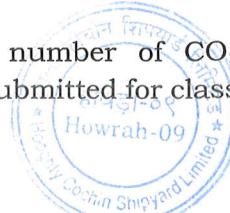
### **2. Technical Requirements**

- a) One set of **IRS Class approved CO<sub>2</sub> Fire Extinguishing system** of the High Pressure, Total Flooding type meeting latest Class/ IMO / SOLAS and protocols including all amendments till date shall be supplied for *ENGINE ROOM* and *CARGO HOLD*. The maker to develop the complete system as part of the scope. Class approval from IRS for equipment and system to be under the maker's scope.
- b) The quantity of carbon dioxide gas to comply with IRS rule requirements and shall be sufficient to give a minimum required volume of free gas based on volumes of areas mentioned below.

<b>Particulars</b>	<b>Gross Volume (m<sup>3</sup>)</b>
Volume of CARGO HOLD	<b>3562.00</b>
Volume of Engine Room (without exhaust / ventilation casing, tank volumes, stairwell casing)	<b>830.00</b>
Volume of Engine Room with Casing	<b>872.00</b>

Note:The final volume of the compartment shall be finalized prior final order.

- c) The Preliminary arrangement drawing for CO<sub>2</sub> Protected Spaces is attached herewith as Annexure -1 for calculation and arrangement of the compartments. This is to be used for reference only.
- d) The CO<sub>2</sub> cylinders shall be stored at CO<sub>2</sub> Storage Room in Emergency Pump Room (Below Main deck) which is located forward of Engine room and aft of Cargo Hold. The firm should check the fitment of CO<sub>2</sub> cylinders and their controls in the CO<sub>2</sub> Storage Room having limited dimensions(approx.) of L=9800mm; B=1800 mm. Final arrangement of CO<sub>2</sub> Cylinder Storage compartment in the scope of the supplier. In case of any issue in the space requirement for operating the equipment as well as the maintenance envelope required to carry out maintenance onboard during normal operation, the same shall be indicated in the offer.
- e) Final CO<sub>2</sub> firefighting system calculation indicating the number of CO<sub>2</sub> Cylinders required onboard acc. to class requirements to be submitted for class review by the supplier.

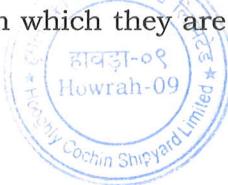


### CO<sub>2</sub> Cylinders & Release Cabinets

- f) CO<sub>2</sub> cylinders should be duly filled with gas complete with all necessary actuators and release valve head assembly as per class rules.
- g) Release of CO<sub>2</sub> gas into the protected space shall be manually carried out with the aid of pneumatic pressure. Ventilation fans at Engine Room and Oil Fuel Pumps shall be stopped automatically when CO<sub>2</sub> system is activated.
- h) CO<sub>2</sub> Release cabinet shall be located outside the protected space.
- i) The release cabinet and main control valve should be mounted with limit switches. The required number of limit switches shall be finalized at the time of drawing approval.

### Piping & Accessories:

- j) All flexible hoses should be type approved.
- k) The CO<sub>2</sub> manifold should be pressure tested as per IRS class requirements.
- l) The pipe for the distribution of fire-extinguishing medium should be so arranged and discharged nozzles so positioned that a uniform distribution of medium is obtained.
- m) All necessary Check valves, Safety/Relief valves to be provided.
- n) Pipe dimensions, number of nozzles, size of nozzles, gas volume etc. should be determined meeting IRS class rule requirements.
- o) Necessary time delay circuits should be provided before releasing CO<sub>2</sub> to protected space as per IRS class requirements.
- p) All check valves and non-return valves shall be provided with an arrow which indicates the direction of flow, and which is fully visible following installation of the valve.
- q) Manually operated valves shall clearly indicate 'open' and 'shut' positions.
- r) Valve handles shall be installed so that the valve is in 'shut' position with the handle across the direction of the flow. All valves shall be suitable for a working pressure of not less than the Test Pressure of the pipework in which they are fitted.



### Alarms & Instrumentation

- s) Audible or visual devices listed below to indicate the operation of the system and hazards to personnel to be supplied.
  - i. One Hooter/ Alarm bell with flasher suitable for Wheel House
  - ii. One each visual alarm outside the protected space (main entry & entry through MSB Room)
  - iii. Sufficient number of audio-visual alarms to adequately cover all parts of the protected area. The alarms are to be of flame proof & sufficient decibel rating to be readily heard above the maximum noise level.
- t) A pressure instrumentation shall be provided for monitoring any leakage/ inadvertent discharge into the manifold. The instrumentation shall activate visual and audible alarms in the protected compartment and the leakage/ inadvertent discharge indicators. The instrumentation shall be capable of manual reset.

### Electrical Requirements

- u) Necessary CO<sub>2</sub> relay box shall be included in the scope of supply for interfacing power supply external systems and alarms. CO<sub>2</sub> relay box to have the following minimum provisions as per OEM standard/ class requirements.
  - i. Shall be powered from both main and emergency source of power
  - ii. Potential free (open for alarm) contact for power fail and CO<sub>2</sub> release for taking to ship's alarm monitoring system.
  - iii. CO<sub>2</sub> release contacts (volt free-NC) for stopping ventilation fans, ventilation dampers, AC units and fuel oil pumps (approx. number of contacts is 6. The final number of contact shall be finalized during drawing approval stage/ final order.)
  - iv. CO<sub>2</sub> release alarm for Wheel house & Engine Room.
  - v. Automatic change over facility inside relay box
  - vi. Fitted with glands for terminating yard's cables. Also, the gland plate provided for relay box must be of removable type.

### Other Accessories

- v) Clamping arrangement for cylinders for mounting vertically on floor to be provided.
- w) Means should be provided for the crew to safely check pressure and quantity of medium within the cylinders.
- x) All necessary instruction plates, caution plates and warning signs to be supplied along with the equipment.
- y) Compressed Air Blow through connection shall be provided.



**NOTE:**

- a. The scope of supply must include CO<sub>2</sub> Cylinders, racks with fastening assembly, cylinder clamps, necessary valves, hoses, manifold, release cabinets, relay box, audio-visual alarms, nozzles, pressure gauges& transmitters, instruction& warning plates, weighing device etc.
- b. The supply should include all necessary items that is required for the satisfactory functioning of the system complying the latest class rules.
- c. The CO<sub>2</sub> system manual must contain all detailed information of the fire extinguishing system including the list of components, CO<sub>2</sub> cylinder calculations, P&ID, Electrical wiring diagrams, CO<sub>2</sub> room arrangement, technical drawings & datasheet of each individual component, hydraulic calculations regarding pipe sizing, arrangement, discharge time, pipe flow rates& nozzle orifice determination, installation, operating& maintenance instructions and spare parts list etc.
- d. The CO<sub>2</sub> system manual to be approved by class as applicable and provided to yard.

**3. Modes of Activation**

- a. **Remote Manual - Pneumatic:** The system shall be primarily be activated from the release cabinet located outside the protected space (main entry). The release cabinet shall contain the required number of pilot cylinders, valves, instrumentation etc.
- b. **Emergency Manual:** Each cylinder should be fitted with manual release lever/mechanisms for activating the system during emergency.

**Note:** The activation of alarms, stoppage of ventilation fans, fuel oil pumps and feedback to control system should be provided in each mode of activation. The modes of activation shall meet the requirements of IRS class rules and as per the Co2 compartment arrangement.

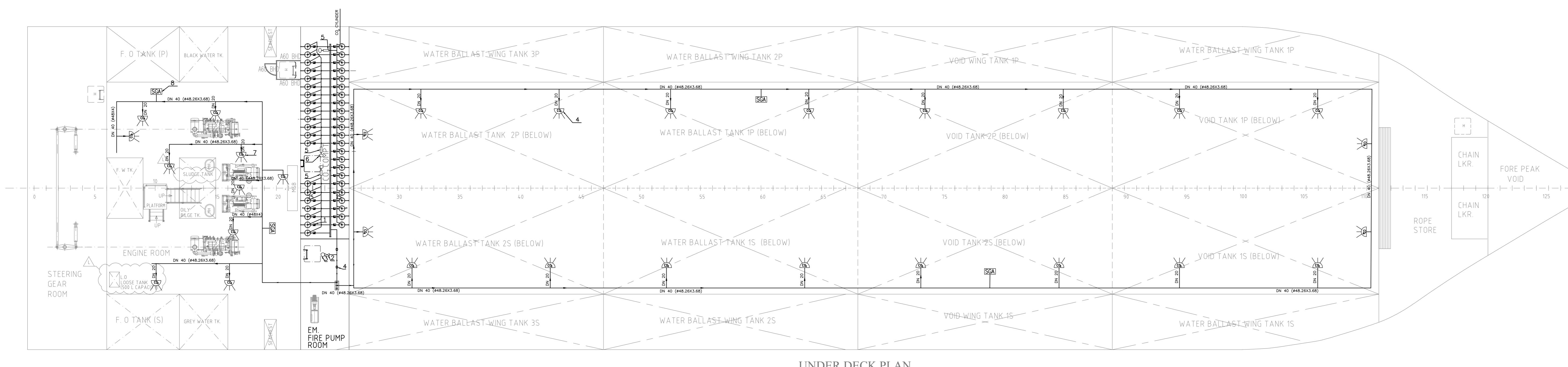
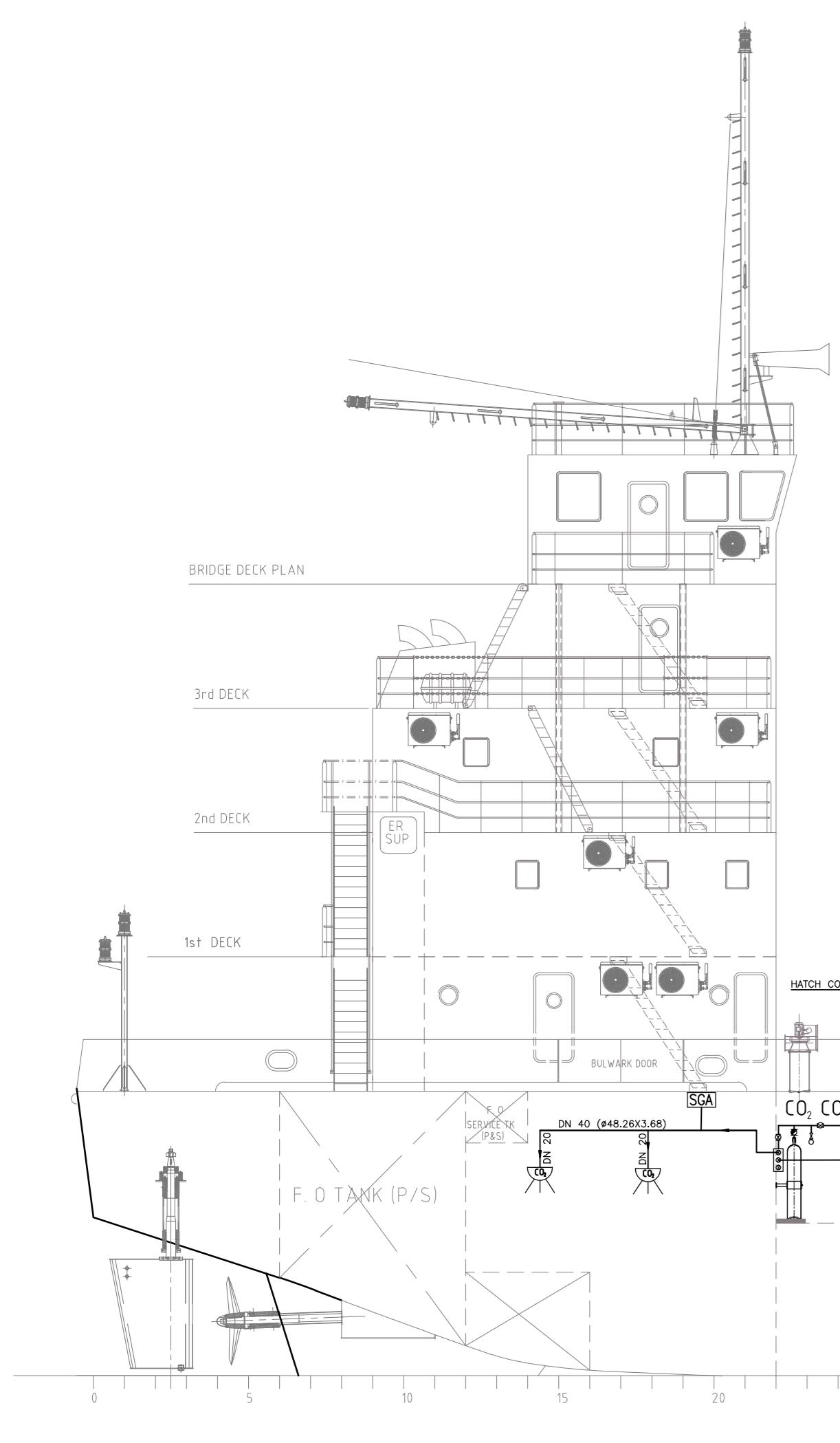
**4. Annexures**

1. Preliminary Drawing for CO<sub>2</sub> Protected Space Annexure-1 (Final arrangement will be after discussion as per OEM recommendation and Design feasibility.)

***NOTE: Notwithstanding any omission in this specification, all items/features required as per class rules/statutory regulations, safe working and good ship building practice shall be included in the offer by the bidder.***

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UNDER DECK PLAN

## CONVERSION

PIPE SPECIFICATION:			
PIPE USE	D.N.	MATERIAL	NORM
PRESSURE GAUGE PIPE		COPPER PIPE	
CO <sub>2</sub> PIPE	40	SEAMLESS STEEL PIPE	Ø48.26 X 3.68
CO <sub>2</sub> PIPE	20	SEAMLESS STEEL PIPE	Ø26.67 X 3.91
CO <sub>2</sub> NOZLE		SEAMLESS STEEL PIPE	GM TO CC /EQUIV.
			M.S. CLASS B, AS PER IS:1239 PART-I
PIPE USE	D.N.	MATERIAL	REMARK

FITTINGS LIST			
SL. NO.	SYMBOL	ITEM NAME	WORKING PRESSURE
9	◎◎◎	DISTRIBUTION VALVE BOX	-
8	SSA	AUTO AUDIBLE ALARM	-
7	◎	NOZZLE	-
6	○	TAB	-
5	□	GUIDE WHEEL	-
4	◎◎	RELEASE VALVE	40 STEEL
3	○	PRESSURE GAUGE VALVE	GM TO CC 492K OF 1982-1999/ BS 1400 0-4 MB
2	△△	PRESSURE GAUGE	1882-1999/ BS 1400 1
1	●	CHECK VALVE	10 STEEL
			43 MANUFACTURER SUPPORTING THE SUPPLY
SL. NO.	SYMBOL	ITEM NAME	MATERIAL
			NUMBER
			REMARKS

CALCULATION FOR CO <sub>2</sub> REQUIREMENT			
a) FOR ENGINE ROOM	VOLUME OF ENGINE ROOM = 830 M <sup>3</sup>	CO <sub>2</sub> REQUIRED = 830X0.4/0.56 = 593 KG	
b) FOR ENGINE ROOM WITH CASING	VOLUME OF ENGINE ROOM WITH CASING = 872 M <sup>3</sup>	CO <sub>2</sub> REQUIRED = 872X0.35/0.56 = 545 KG	
c) FOR CARGO HOLD	VOLUME OF CARGO HOLD = 3562 M <sup>3</sup>	CO <sub>2</sub> REQUIRED = 3562X0.30/0.56 = 1908 KG	
	NO OF 45 KG CO <sub>2</sub> CYLINDER PROVIDED = 43 NOS.	CO <sub>2</sub> PROVIDED = 43 X 45 = 1935 KG	

A	REVISED FOR CHANGE IN CYLINDER ARRANGEMENT CO <sub>2</sub> SYSTEM FOR EDG ROOM REMOVED	SP	PM	14.01.26
REV	MODIFICATION	BY	CHK'D	DATE
PROJECT 2200 TONNE / 128 TEU MULTIPURPOSE VESSEL				
TITLE CO <sub>2</sub> SYSTEM				
DRAWN BY : MPL	DRG NO : P008-421	SCALE : 1 : 100		
CHECKED BY : PM	SHEET : 01	SIZE : A0		
	DATE : 17/11/2025	REV. : A		
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CLIENT	JAK MARITIME & LOGISTICS PRIVATE LIMITED.	HULL NO.		
BUILDER	HOOGHLY COCHIN SHIPYARD LIMITED	004/22004		
DESIGNER	Mariccons Private Limited	TEL : (+91)9007227123	webmail.mariccons.com	mariccons