

ANNEX V PDR-CDR (REV 2)

DESIGN REVIEW MEETINGS DELIVERABLES TABLE, REV 2		
ITEMS	PDR - Preliminary Design Review Meeting PRELIMINARY DOCUMENTS	CDR - Critical Design Review Meeting FINAL DOCUMENTS
PART A - GENERAL REQUIREMENTS		
GR1 General Requirements and contract section requirements	1. Any Overall Project Organizational Chart changes? 2. updated version of the Milestone Delivery dates and VLE Work Schedule (must be produced with a commercially available project management software; review proposed software) 3. update of subcontractor's and Field Service Representatives' (FSRs) commitments (commitments to finalize within 2 months) 4. Risk Management Register Update 5. Indigenous Participation Component Plan (contract Annex L)	1. Any Overall Project Organizational Chart changes? 2. updated version of the Milestone Delivery dates and VLE Work Schedule 3. Risk Management Register Update 4. list of Government equipment that the Contractor intends to request (1.28)
GR2 General Technical		
GR3 General Mechanical		
GR4 General Electrical		
GR5 Electro -Magnetic Interference		
GR6 Documentation	1. Updated Document and Drawing Registers	1. updated Document and Drawing Registers
GR7 Inspection, Tests and Trials	1. Overall ITP (completed for equipment purchases and all work period items)	1. Overall ITP (completed for equipment purchases and all work period items) 2. Pre-Arrival Sea Trial Test Plan, 2.0
GR8 Stability	1. Preliminary Ship Stability Calculations with the new equipment/engineering changes.	1. Final Ship Stability Calculations with the new equipment/engineering changes.
GR9 Berthing and Docking		
GR10 Services		
GR11 Field Service Representative (FSR) Requirements		1.FSR commitments attained.
GR12 Integration and Power Management	Detail of full power management approach must be provided by the Contractor for review and comment by the TA and Class Approval. The Power Management Plan must include: a)Description of all envisioned operational modes and primary means of overall load management associated with each. b)Detailed explanation of what power management functions reside in what hardware: Switchboard, CCAMS, PCS, other, and how such functions are integrated. c)Detail of operator interface options and all operator selectable functionality and configuration options. d)Detail of all Automatic, Semi-Automatic, Manual and Emergency operational procedures. e)Drawing package, as required by Class, for approval of the overall Integration and Power Management Plan. f)Definition of Integration and Power Management Software layout in which all related software, and its host hardware, is identified. An explanation of the functionality and integration of all related software platforms must be offered as well as access to all such software.	Detail of full power management approach must be provided by the Contractor for review and comment by the TA and Class Approval. The Power Management Plan must include: a)Description of all envisioned operational modes and primary means of overall load management associated with each. b)Detailed explanation of what power management functions reside in what hardware: Switchboard, CCAMS, PCS, other, and how such functions are integrated. c)Detail of operator interface options and all operator selectable functionality and configuration options. d)Detail of all Automatic, Semi-Automatic, Manual and Emergency operational procedures. e)Drawing package, as required by Class, for approval of the overall Integration and Power Management Plan. f)Definition of Integration and Power Management Software layout in which all related software, and its host hardware, is identified. An explanation of the functionality and integration of all related software platforms must be offered as well as access to all such software.
PART B		
10.0 SAFETY & SECURITY		
10.1 Life Raft Recertification		
10.2 Lifeboat & Miranda Davit Annual Inspection		
10.3 Fire Detection System Replacement	a)Drawings and general manufacturer provided system, technical and parts information applicable to all hardware and functionality proposed for the new FDS. b)Class approval documentation for proposed hardware c)FDS Cabinet Arrangement Drawings d)Confirmation of proposed installation locations for all major components – central processing unit(s), batteries, HMI stations etc. e)Confirmation of proposed power supply requirements and arrangements. f)FDS Block Diagram g)Cable Route & Cable Loop Line Diagrams. Cable route drawing must show equipment layout, and as fitted cable routing over General Arrangement.	a)Drawings and general manufacturer provided system, technical and parts information applicable to all hardware and functionality proposed for the new FDS. b)Class approval documentation for proposed hardware c)FDS Cabinet Arrangement Drawings d)Confirmation of proposed installation locations for all major components – central processing unit(s), batteries, HMI stations etc. e)Confirmation of proposed power supply requirements and arrangements. f)FDS Block Diagram g)Cable Route & Cable Loop Line Diagrams. Cable route drawing must show equipment layout, and as fitted cable routing over General Arrangement.
10.4 Fire Fighting Equipment Recertification		

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PDR - Preliminary Design Review Meeting PRELIMINARY DOCUMENTS		
10.5	Watertight Door Replacement	<p>a)Drawings and general manufacturer provided technical and parts information applicable to all hardware proposed for the new WTDS.</p> <p>b)Class approval documentation for proposed hardware.</p> <p>c)System arrangement plan indicating proposed location and arrangement of the system overall and detail as applicable to each door installation.</p> <p>d)Hydraulic system one line diagram</p> <p>e)Hydraulic system piping arrangement indicating all system components and proposed hydraulic routing over General arrangement</p> <p>f)Electrical system drawings including proposed power supplies, all system interconnection requirements and wiring requirements at each door.</p> <p>g)Cable list and connection diagrams.</p> <p>h)Electric cable routing plan indicating all system components and cable runs over General Arrangement.</p> <p>i)Detail drawings of hydraulic pump set motor controller</p> <p>j)All other documentation required by Class to allow Class approval of the proposed WTDS, its installation on the vessel and issuance of Class approved plans for the WTDS.</p> <p>k)Wheelhouse Panel Fire Door Status</p>
10.6	Fire Main & Monitor Piping System Replacement	Submit the proposed BOM of the new fire main and monitor systems (final)
10.7	Local Application Fire Fighting System Installation	<p>a)Drawings and manufacturer provided general technical and parts information applicable to all hardware proposed for the new LAFFS.</p> <p>b)Layout drawing of pump, showing main dimensions and location of pipe connections and attachment points</p> <p>c)Class approval documentation for the proposed LAFFS hardware.</p> <p>d)LAFFS pipe and tube diagrams and arrangements. Pipe routing drawings must show equipment layout and proposed pipe and tube routing over General Arrangement as well proposed location of section valves and spray nozzles.</p> <p>e)Feed Pump location and piping size and routing detail</p> <p>f)Fire main connection and piping size and routing detail.</p> <p>g)Electrical diagrams confirming proposed power supply requirements and all other electrical and control connections and cable routing.</p> <p>h)Connection Diagram/Cable Schedule</p> <p>i)Internal circuit diagram of electric cabinets</p> <p>j)Panel layouts</p> <p>k)All other documentation required by Class to allow Class approval of the proposed system and its installation on the vessel and issuance of Class approved plans for the LAFFS.</p>
10.8	Safety Relief Valves	
10.9	Fog Horn Installation	Components datasheets, electrical plan and planned location (final)
10.10	FM200 System Modification	
10.11	FM200 System Monitoring	
11.0 HULL & RELATED STRUCTURES		
11.1	Hull Cleaning	
11.2	Hull Inspection	
11.3	Hull and Structural Steel Repairs	
11.4	Hull Protection System Service	
11.5	Sea Chests & Sea Bays	Access and Closing Plan (approved by class)
11.6	Sea Chest& Sea Bay Protection System Service	
11.7	RO Suction Sea Chest	
11.8	Fender Repairs	
11.9	Hull Coating	
11.10	Sea Valves and Connections	
11.11	Main Deck Plating Repair	
11.12		
11.13	Superstructure and Decks Coating	
11.14	Internal Steel Repair (Air Trunk)	
11.15	Void & Miscellaneous Tanks	Access and Closing Plan (approved by class)
11.16	Vent & Sounding Pipes	
11.17		
11.18	Forward Mast Replacement	Class approved drawing for the new mast
11.19	Aft Bulwark Replacement	Class approved drawing for the specified bulwark repairs and upgrades
11.20	Window & Skylight Replacement	
11.21	Window Wiper Replacement	

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ITEMS	PDR - Preliminary Design Review Meeting PRELIMINARY DOCUMENTS	CDR - Critical Design Review Meeting FINAL DOCUMENTS
11.22 Forward Stores Hatch Replacement	Drawing for the new hatch and hatch installation	Class approved drawing for the new hatch and hatch installation
11.23 Weather Door Replacement		
11.24		
11.25 Logistics Office Renovation	a) Preliminary Floor plan arrangement b) Preliminary Elevation arrangement of each wall c) Fixed mounting requirements for outfitting d) Preliminary Bulkhead lining plan e) Preliminary Ceiling lining plan f) Preliminary Electrical outfit plan including 120VAC electrical receptacles, lighting and light switching arrangement, ICS layout, phones and PA speaker arrangement, fire detection hardware layout, vessel's LAN connection layout. g) Complete BOM identifying detail of all outfitting to be installed.	a) Final Floor plan arrangement b) Final Elevation arrangement of each wall c) Fixed mounting requirements for outfitting d) Final Bulkhead lining plan e) Final Ceiling lining plan f) Final Electrical outfit plan including 120VAC electrical receptacles, lighting and light switching arrangement, ICS layout, phones and PA speaker arrangement, fire detection hardware layout, vessel's LAN connection layout. g) Complete BOM identifying detail of all outfitting to be installed.
11.26 Void Space Conversion		
11.27 Alleyway Deck Coverings Replacement		
11.28 Bilge Cleaning		
11.29 Galley Renovation	a) Preliminary Floor plan arrangement b) Preliminary Elevation arrangement of each wall c) Fixed mounting plan for all equipment and outfitting d) Preliminary Bulkhead lining plan e) Preliminary Ceiling lining plan f) Preliminary Electrical outfit plan including 120VAC electrical receptacles, lighting and light switching arrangement, ICS layout, phones and PA speaker arrangement, fire detection hardware layout. g) Preliminary Domestic water plan h) Preliminary Grey water plan i) Complete BOM identifying detail of all equipment and outfitting proposed j) OEM specification sheets for all new equipment proposed k) Production drawings for all items of outfit requiring custom manufacture Access and Closing Plan	a) Final Floor plan arrangement b) Final Elevation arrangement of each wall c) Fixed mounting plan for all equipment and outfitting d) Final Bulkhead lining plan e) Final Ceiling lining plan f) Final Electrical outfit plan including 120VAC electrical receptacles, lighting and light switching arrangement, ICS layout, phones and PA speaker arrangement, fire detection hardware layout. g) Final Domestic water plan h) Final Grey water plan i) Complete BOM identifying detail of all equipment and outfitting proposed j) OEM specification sheets for all new equipment proposed k) Production drawings for all items of outfit requiring custom manufacture Access and Closing Plan
11.30 Central Stores Rebuild		
11.31 Focsle Deck Storage Locker Installation		
11.32 Noise Abatement		
12.0 PROPULSION & MANOEUVERING SYSTEMS		
12.1 Propulsion Machinery Replacement	Refer to section 3.11 for all details, but generally to include: 1. Preliminary Electrical schematics/design for the PS and the vessel; 2. Preliminary Electrical hardware for the PS and the vessel; 3. Preliminary Software Architecture/Design; 4. Preliminary Vibration Analysis for the PS with its sub-base and vessel's base and structure; 5. Preliminary Structural drawings/design for the PS and the vessel structure; 6. Preliminary Mechanical drawings/design for the PS and the vessel; 7. Preliminary Mechanical hardware for the PS and the vessel; 8. Preliminary Aux systems drawings/design for the PS and the vessel & Major components datasheets; 9. Preliminary Heat Rejection Analysis for the central cooling system; 10. Preliminary Auxiliary hardware for the PS and vessel;	Refer to section 3.11 for all details, but generally to include: 1. Final Electrical schematics/design for the PS and the vessel; 2. Final Electrical hardware for the PS and the vessel; 3. Final Software Architecture/Design; 4. Final Vibration Analysis for the PS with its sub-base and vessel's base and structure; 5. Final Structural drawings/design for the PS and the vessel structure; 6. Final Mechanical drawings/design for the PS and the vessel; 7. Final Mechanical hardware for the PS and the vessel; 8. Final Auxiliary systems drawings/design for the PS and the vessel & Major components datasheets; 9. Final Heat Rejection Analysis for the central cooling system; 10. Final Auxiliary hardware for the PS and vessel;

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	11. Preliminary Details of a Failure Modes and Effect Analysis (FMEA) for the PS; 12. Preliminary EC Integration and Installation Specifications and Drawings; 13. Preliminary PS ship's lifting/handling procedures with required setups, required vessel's shipping route(s), dismantling(s), shipping opening(s), temporary structural reinforcement(s) packages (specs and drawing); 14. Preliminary Design of the PS components' lifting and handling attachment points; tools and equipment required for maintenance, for transportation, for temporary storage in the shipyard and for transfer from storage to the vessel's engine room; 15. Preliminary PS (including all separate components and equipment) packaging and protection required for transportation, temporary storage in the shipyard and transfer from storage to the vessel's engine room; 16. Preliminary PS Inspection Test Plan (PS ITP, for integration/reference in the OVERALL ITP) to cover as a minimum the FAT, VIT, DTP and SAT;	11. Final Details of a Failure Modes and Effect Analysis (FMEA) for the PS; 12. Final EC Integration and Installation Specifications and Drawings; 13. Final PS ship's lifting/handling procedures with required setups, required vessel's shipping route(s), dismantling(s), shipping opening(s), temporary structural reinforcement(s) packages (specs and drawing); 14. Final Design of the PS components' lifting and handling attachment points; tools and equipment required for maintenance, for transportation, for temporary storage in the shipyard and for transfer from storage to the vessel's engine room; 15. Final PS (including all separate components and equipment) packaging and protection required for transportation, temporary storage in the shipyard and transfer from storage to the vessel's engine room; 16. Final PS Inspection Test Plan (PS ITP, for integration/reference in the OVERALL ITP) to cover as a minimum the FAT, VIT, DTP and SAT; 17. Final listing of the Classification Society and/or TCMS appropriate and applicable Certifications and Approvals required; 18. Final Integrated Logistics Support (ILS) documentation; 19. Final Shipping and Handling and route
12.2	Bubbler Compressor Replacement	Access and Closing Plan
12.3	Bubbler Piping Replacement	Access and Closing Plan (approved by class)
	a)BOM for the new bubbler compressor air discharge piping system. b)Class approval documentation for all proposed materials c)Access and Closing Plan as per section 3.2	a)BOM for the new bubbler compressor air discharge piping system. b)Class approval documentation for all proposed materials c)Access and Closing Plan as per section 3.2
12.4	Bubbler Piping Cofferdam Construction	
12.5	Rudder, Stock & Carrier Bearing Inspection	
12.6	Steering Gear & Control Upgrade	
12.7		
12.8	Stern Thruster Maintenance	
	New motor and VFD proposal package : a)Motor specification detail b)VFD specification detail. c)Electric cabling requirement detail. d)Detail of all measures incorporated in the motor/VFD package to mitigate common mode voltage risks. e)Detail of all requirements for integration, connection and configuration with the existing stern thruster control system.	New motor and VFD proposal package : a)Motor specification detail b)VFD specification detail. c)Electric cabling requirement detail. d)Detail of all measures incorporated in the motor/VFD package to mitigate common mode voltage risks. e)Detail of all requirements for integration, connection and configuration with the existing stern thruster control system. f)Class approval documentation for all proposed hardware
12.9	Propellers Service	
12.10	Tailshafts & Stern Tubes	
12.11	Rope Guards	
12.12	Tailshafts Wear-down	
12.13	Intermediate Shafts & Bearings	
12.14	CPP System Service	
13.0 ELECTRICAL POWER GENERATION		
13.1	Shaft Alternator Replacement & Frequency Stabilization	
	include the following : a)Electrical Single Lines and Schematics - preliminary b)Complete Bill of Materials (BoM) - preliminary c)Mechanical Drawings - preliminary d)Operation Procedures e)Maintenance Procedures f)A documentation registry g)Factory Acceptance Test Procedures up to and including full load trials h)Site Acceptance Test Procedures i)Functional Descriptions	include the following: a)Electrical Single Lines and Schematics -- final b)Complete Bill of Materials (BoM) - final c)Mechanical Drawings - final d)Operation Procedures e)Maintenance Procedures f)A documentation registry g)Factory Acceptance Test Procedures up to and including full load trials h)Site Acceptance Test Procedures i)Functional Descriptions j) Class Approval
14.0 ELECTRICAL POWER DISTRIBUTION		

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ITEMS		PDR - Preliminary Design Review Meeting PRELIMINARY DOCUMENTS	CDR - Critical Design Review Meeting FINAL DOCUMENTS
14.1	Electrical System Analysis	Short Circuit Calculations - preliminary Coordination Analysis - preliminary Arc Flash Analysis - preliminary Load Analysis Study - preliminary SINGLE LINE DIAGRAM - preliminary	Short Circuit Calculations - final Coordination Analysis - final Arc Flash Analysis - final Load Analysis Study - final SINGLE LINE DIAGRAM - final Class approval
14.2	Switchboards Upgrade		
14.3	Motor Control Centers Upgrade		
14.4	Electrical Distribution Panels Service	provide a DC power supply plan - preliminary	provide a DC power supply plan - final
14.5	TEP Inverter Replacement	a)TEP Inverter capacity determination based on assessment, and Class approval, of all electrical loads, new and existing, that must be supplied from the TEP system. b)Updated electrical drawing indicating all loads to be supplied by the new TEP system. c)Complete BOM for a new TEP Inverter system d)Product data and specification sheets for all hardware to be installed. e)An Access Plan that details any structural removals required to facilitate replacement of the TEP Inverter and charger. f)A Closing Plan that details all structural material specifications and weld procedure details required for reassembly of structural removals identified in the Access Plan	a)TEP Inverter capacity determination based on assessment, and Class approval, of all electrical loads, new and existing, that must be supplied from the TEP system. b)Updated electrical drawing indicating all loads to be supplied by the new TEP system. c)Complete BOM for a new TEP Inverter system d)Product data and specification sheets for all hardware to be installed. e)Class approval documentation for the new TEP Inverter and the new battery charger. f)An Access Plan that details any structural removals required to facilitate replacement of the TEP Inverter and charger. g)A Closing Plan that details all structural material specifications and weld procedure details required for reassembly of structural removals identified in the Access Plan
14.6			
14.7			
14.8	Megger Survey		
14.9	Thermal Scan Survey		
15.0 AUXILIARY SYSTEMS			
15.1	Sea Water Piping System Replacement		
15.2	Bilge & Ballast System Piping Replacement		
15.3	Ballast Tanks	Access and Closing Plan	Access and Closing Plan (approved by class)
15.4	Pump Replacement		
15.5			
15.6			
15.7			
15.8	Fuel Oil Transfer Equipment Replacement	<u>Transfer Pumps</u> a)General arrangement drawings, b)OEM information and specifications and performance data sheets c)Confirmation of new pump fit within existing piping arrangement. <u>Suction Strainer</u> a)General Arrangement drawings and verification that mesh size is in accordance with the requirements of the transfer pump manufacturer <u>Flow Meters</u> a)General Arrangement and detail drawings. b)OEM specifications and performance and accuracy data sheets. c)Confirmation of fit within exiting piping arrangement, d)Confirmation of ability to communicate flow data to CCAMS and communications protocol used. <u>Quick Closing Valve System</u> a)General Arrangement and detail drawings of valves and control system b)Confirmation of valve fit within existing piping arrangement. c)Confirmation of proposed means of operation – pneumatic or hydraulic.	<u>Transfer Pumps</u> a)General arrangement drawings, b)OEM information and specifications and performance data sheets c)Confirmation of new pump fit within existing piping arrangement. <u>Suction Strainer</u> a)General Arrangement drawings and verification that mesh size is in accordance with the requirements of the transfer pump manufacturer <u>Flow Meters</u> a)General Arrangement and detail drawings. b)OEM specifications and performance and accuracy data sheets. c)Confirmation of fit within exiting piping arrangement, d)Confirmation of ability to communicate flow data to CCAMS and communications protocol used. <u>Quick Closing Valve System</u> a)General Arrangement and detail drawings of valves and control system b)Confirmation of valve fit within existing piping arrangement. c)Confirmation of proposed means of operation – pneumatic or hydraulic. <u>General</u> a)Proof of Class approval of all proposed new hardware. b)BOM for all other proposed material supply for this item. c)The Contractor must be responsible for confirming all sizing and bolting arrangement detail for all hardware to be supplied prior to placing orders.
15.9			
15.10	Fuel Oil Tanks		
15.11			
15.12	Compressed Air System		
15.13			
15.14			
15.15			
15.16	Lube Oil Tanks		

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ITEMS	PDR - Preliminary Design Review Meeting PRELIMINARY DOCUMENTS	CDR - Critical Design Review Meeting FINAL DOCUMENTS
16.0 DOMESTIC SYSTEMS		
16.1 Domestic Water System Piping Replacement	a)Proposed pressure pump suction/discharge and aft circulating pump piping modification plan. This plan must be accepted by the TA and approved by Class prior to commencement of piping alterations. b)A complete BOM for all components of the new piping systems	a)Proposed pressure pump suction/discharge and aft circulating pump piping modification plan. This plan must be accepted by the TA and approved by Class prior to commencement of piping alterations. b)A complete BOM for all components of the new piping systems
16.2 Domestic Water System Equipment Replacement	submit details (layout, P&ID and electrical drawings and/or data specifications) of all proposed hardware supply, such as: a)Pressure Pump Units b)Pressure Tanks c)Hot Water Heater and Control Panel d)Circulating Pump Units e)Dosing Pumps f)Chlorine Analyzers g)Chlorine Injectors	submit details (layout, P&ID and electrical drawings and/or data specifications) of all proposed hardware supply, such as: a)Pressure Pump Units b)Pressure Tanks c)Hot Water Heater and Control Panel d)Circulating Pump Units e)Dosing Pumps f)Chlorine Analyzers g)Chlorine Injectors
16.3 Domestic Water Tanks	Access and Closing Plan	Access and Closing Plan (approved by class)
16.4 Sewage Treatment Plant Replacement		
16.5		
16.6 Sewage & Grey Water System Replacement		
16.7 Fridge Plant Replacement	a)Schematic diagram of the new RS b)Design calculations for the new RS c)Complete BOM for the new RS d)Detail of RS electrical, control and monitoring system and confirmation of communication capability with vessel's CCAMS. e)Individual component manufacturer technical data sheets for all components of the new RS.	a)Schematic diagram of the new RS b)Design calculations for the new RS c)Complete BOM for the new RS d)Detail of RS electrical, control and monitoring system and confirmation of communication capability with vessel's CCAMS. e)Individual component manufacturer technical data sheets for all components of the new RS.
16.8 Fridge Space Refurbishment		
16.9 Electronics Room AC Replacement	a)Schematic diagram of the new Mini-Split Air conditioning System. b)Design calculations for the new Mini-Split Air Conditioning System c)Complete BOM for the new Mini-Split Air Conditioning System. d)Individual component manufacturer technical data sheets for all components of the new Mini-Split Air Conditioning System. e)Seat and hood drawings as defined in sections 3.2.1.2 through 3.2.1.5. f)Any other documentation as may be required by Class in support of Class approval of final plan for all work herein specified.	a)Schematic diagram of the new Mini-Split Air conditioning System. b)Design calculations for the new Mini-Split Air Conditioning System c)Complete BOM for the new Mini-Split Air Conditioning System. d)Individual component manufacturer technical data sheets for all components of the new Mini-Split Air Conditioning System. e)Seat and hood drawings as defined in sections 3.2.1.2 through 3.2.1.5. f)Any other documentation as may be required by Class in support of Class approval of final plan for all work herein specified.
16.10 Incinerator Replacement & Upgrade		
16.11 Machinery Space Ventilation Maintenance	a)Aft Auxiliary Machinery Space Vent Housing Port b)Aft Auxiliary Machinery Space Vent Housing Starboard c)Fwd. Auxiliary Machinery Space Vent Louver Wave Deflector Port & Starboard d)Fwd. Auxiliary Machinery Space Supply Trunking Modification Plan approval documents must include: a)Schematic diagram of the new designs b)Complete BOM for the new designs c)Any other documentation as may be required by Class in support of Class approval of final plan for all work herein specified.	a)Aft Auxiliary Machinery Space Vent Housing Port b)Aft Auxiliary Machinery Space Vent Housing Starboard c)Fwd. Auxiliary Machinery Space Vent Louver Wave Deflector Port & Starboard d)Fwd. Auxiliary Machinery Space Supply Trunking Modification Plan approval documents must include: a)Schematic diagram of the new designs b)Complete BOM for the new designs c)Any other documentation as may be required by Class in support of Class approval of final plan for all work herein specified.
16.12 HVAC Systems Duct Cleaning		
16.13 Galley Air Conditioning Installation	a)Design calculations for the new mounting structures. b)Complete BOM for the new Mini-Split Air Conditioning System c)Individual component manufacturer technical data sheets for all components of the new Mini-Split Air Conditioning System. d)Mounting drawings as referenced in sections 3.2.1.2 and 3.2.1.3. e)Any other documentation as may be required by Class in support of Class approval of final plan for all work herein specified.	a)Design calculations for the new mounting structures. b)Complete BOM for the new Mini-Split Air Conditioning System c)Individual component manufacturer technical data sheets for all components of the new Mini-Split Air Conditioning System. d)Mounting drawings as referenced in sections 3.2.1.2 and 3.2.1.3. e)Any other documentation as may be required by Class in support of Class approval of final plan for all work herein specified.
16.14 Galley Exhaust System Maintenance		
16.15 Galley Exhaust Fan Silencer Installation	a)Schematic diagram of the new Silencer, Fan and trunking system. b)Design calculations for the new Silencer, Fan and trunking system. c)Complete BOM for the new Silencer, Fan and trunking system d)Individual component manufacturer technical data sheets for all components of the new Silencer, Fan and trunking system.	a)Schematic diagram of the new Silencer, Fan and trunking system. b)Design calculations for the new Silencer, Fan and trunking system. c)Complete BOM for the new Silencer, Fan and trunking system d)Individual component manufacturer technical data sheets for all components of the new Silencer, Fan and trunking system.

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16.16 Machinery Space Fan Maintenance		
16.17 Natural Ventilation Refurbishment		
16.18 Steering Gear Compartment ventilation modification	a)Schematic diagram of the new Mini-Split Air conditioning System. b)Design calculations for the new Mini-Split Air Conditioning System c)Complete BOM for the new Mini-Split Air Conditioning System, d)Individual component manufacturer technical data sheets for all components of the new Mini-Split Air Conditioning System. e)Mounting plans for the indoor and outdoor units.	a)Schematic diagram of the new Mini-Split Air conditioning System. b)Design calculations for the new Mini-Split Air Conditioning System c)Complete BOM for the new Mini-Split Air Conditioning System, d)Individual component manufacturer technical data sheets for all components of the new Mini-Split Air Conditioning System. e)Mounting plans for the indoor and outdoor units.
16.19 Wheelhouse Ventilation System Replacement	a)Schematic diagram of the new Air Handling Unit b)Design calculations for the new Air Handling Unit c)Complete BOM for the new Air Handling Unit d)Individual component manufacturer technical data sheets for all components of the new Air Handling Unit New Design Criteria e)Any other documentation as may be required by Class in support of Class approval of final plan for all work herein specified.	a)Schematic diagram of the new Air Handling Unit b)Design calculations for the new Air Handling Unit c)Complete BOM for the new Air Handling Unit d)Individual component manufacturer technical data sheets for all components of the new Air Handling Unit New Design Criteria e)Any other documentation as may be required by Class in support of Class approval of final plan for all work herein specified.
17.0 DECK EQUIPMENT/SHIP SUPPORT SYSTEMS		
17.1 40 Ton deck Crane Replacement	Documents to Be Submitted Within Three (3) Months After Placement of Order The following list of drawings / documents must be submitted to Canada after the ordering of the selected crane: i.Load and information charts ii.Crane foundation design included associated forces and moments iii.List of all critical components and certification(s) that these components meet: o both the Classification Rules and Transport Canada Marine Safety requirements, o have material traceability, o approved CWB welding procedures (as applicable), and o non-destructive examination requirements. iv.Approved installation drawings v.Detailed approved drawings of any structure that may have to be installed as detailed in the engineering analysis and FEA report. vi.Foundation/mountings details vii.Schematic drawings of all systems i.e., hydraulic, electrical, alarm etc. viii.All relevant class approved drawings and documents. ix.Installation drawings indicating foundation details and procedures showing space constraints for withdrawal of various accessories of all the offered machinery and equipment. x.Provide a comprehensive and detailed listing (i.e., operating voltages and amperage requirements etc.) of the cranes safety alarm(s), set operating and operating points to allow for modifications to be made to the existing AMS system to accept the new I/O inputs.	Along with any finalized drawings from Preliminary, The Contractor must submit the following certificates and reports in triplicate (1 original + 2 copies) after FAT trial: a)FAT test data duly signed by Class, b)Classification Type approval, c)Manufacturer Test Certificates
17.2 Deck Machinery Mechanical Service		
17.3 Deck Machinery Electrical		
17.4 Stern Roller Service		
17.5 Mooring Winch Installation	a)Drawings and specification detail of the proposed new mooring winches. b)Confirmation of new winch manufacturer technical, service and parts support on the East Coast of Canada. c)Specifications and detail of new winch drive motors and variable frequency drives. d)New mooring plan for the forecastle deck reflecting the new mooring winches, their integration with existing mooring hardware and any additional, new mooring hardware to facilitate application of the new winches. e)Drawings and specification for any upgraded or new mooring hardware required to accommodate application of the new winches. f)Full structural assessment report in way of the new winches and all related mooring hardware. g)Drawings of any required structural modifications to accommodate the new winches and the new mooring plan. h)Drawings of new winch seats. i)Electrical drawing package defining electrical power supply requirements and all cabling requirements for the new winch installation.	a)Drawings and specification detail of the proposed new mooring winches. b)Confirmation of new winch manufacturer technical, service and parts support on the East Coast of Canada. c)Specifications and detail of new winch drive motors and variable frequency drives. d)New mooring plan for the forecastle deck reflecting the new mooring winches, their integration with existing mooring hardware and any additional, new mooring hardware to facilitate application of the new winches. e)Drawings and specification for any upgraded or new mooring hardware required to accommodate application of the new winches. f)Full structural assessment report in way of the new winches and all related mooring hardware. g)Drawings of any required structural modifications to accommodate the new winches and the new mooring plan. h)Drawings of new winch seats. i)Electrical drawing package defining electrical power supply requirements and all cabling requirements for the new winch installation.

DESIGN REVIEW MEETINGS DELIVERABLES TABLE, REV 2		
ITEMS	PDR - Preliminary Design Review Meeting PRELIMINARY DOCUMENTS	CDR - Critical Design Review Meeting FINAL DOCUMENTS
17.6 Stores Crane Replacement	a)General arrangement drawing of the proposed new crane b)Load chart for the proposed new crane. c)Full specification sheet for the proposed new crane verifying all other specified requirements are satisfied. d)Mounting detail of the proposed new crane and verification that modification of the existing seat will not be required. e)Verification that the existing seat and deck structure are of sufficient strength to carry the proposed crane. f)Electrical drawing for the proposed crane confirming existing electrical supply will not have to be upgraded.	a)General arrangement drawing of the proposed new crane b)Load chart for the proposed new crane. c)Full specification sheet for the proposed new crane verifying all other specified requirements are satisfied. d)Mounting detail of the proposed new crane and verification that modification of the existing seat will not be required. e)Verification that the existing seat and deck structure are of sufficient strength to carry the proposed crane. f)Class approval documentation for the new crane for intended application on the vessel. g)Electrical drawing for the proposed crane confirming existing electrical supply will not have to be upgraded.
17.7 Bollard Replacement		Manufacturer drawings of the new bollards. (may be included with 17.5 items)
17.8 Anchors and chain inspection		
17.9 Windlass		
17.10 Chain Locker inspection		
17.11 5 Ton Crane inspection		
17.12 Towing Outfit	a)General arrangement drawing b)Load chart c)Full specification sheet verifying all other specified requirements are satisfied. d)Mounting detail and verification that modification of the existing structure will not be required. e)Verification that the existing seat and deck structure are of sufficient strength f)Electrical drawing confirming existing electrical supply will not have to be upgraded.	a)General arrangement drawing b)Load chart c)Full specification sheet verifying all other specified requirements are satisfied. d)Mounting detail and verification that modification of the existing structure will not be required. e)Verification that the existing seat and deck structure are of sufficient strength f)Electrical drawing confirming existing electrical supply will not have to be upgraded. g)Class approval documentation for the new crane for intended application on the vessel.
18.0 VESSEL COMMUNICATIONS & NAVIGATION		
18.1 Internal Communication System Upgrade	a)Proposed Service Provider for design and supply of the ICS. b)Make, model and manufacturer of the proposed ICS. c)Proposed ICS components and sub-components parts list. d)OEM technical information, drawings, dimensions, power consumption, heat dissipation and other specifications for proposed system hardware. e)System general arrangement and component layout plan on the vessels' General Arrangement drawings. f)Single line block diagrams with cable type identification of the system as laid out on each deck on the vessel's General Arrangement drawings. g)Overall system electrical wiring drawings for the proposed system including identification of all required power supplies. h)Cable routing drawings i)Cable list and connection and termination diagrams for the proposed system j)Preliminary, operation, installation, and service manuals for the proposed ICS. k)All other documentation required by Class to allow Class approval of the proposed ICS, its installation on the vessel and issuance of Class approved plans for the ICS.	a)Proposed Service Provider for design and supply of the ICS. b)Make, model and manufacturer of the proposed ICS. c)Proposed ICS components and sub-components parts list. d)OEM technical information, drawings, dimensions, power consumption, heat dissipation and other specifications for proposed system hardware. e)System general arrangement and component layout plan on the vessels' General Arrangement drawings. f)Single line block diagrams with cable type identification of the system as laid out on each deck on the vessel's General Arrangement drawings. g)Overall system electrical wiring drawings for the proposed system including identification of all required power supplies. h)Cable routing drawings i)Cable list and connection and termination diagrams for the proposed system j)Preliminary, operation, installation, and service manuals for the proposed ICS. k)All other documentation required by Class to allow Class approval of the proposed ICS, its installation on the vessel and issuance of Class approved plans for the ICS.
18.2 AIS replacement		
18.3 Auto pilot replacement		
18.4 Distance measuring system upgrade		
18.5		
18.6 VHF-DF		
18.7 CCTV (Camera System)		
18.8		
18.9 Gyro Compass		
19.0 INTEGRATED CONTROL SYSTEMS		

DESIGN REVIEW MEETINGS DELIVERABLES TABLE, REV 2		
ITEMS		PDR - Preliminary Design Review Meeting PRELIMINARY DOCUMENTS
		CDR - Critical Design Review Meeting FINAL DOCUMENTS
19.1	Propulsion Control System Upgrade	<p>a)Description of PCS system general layout and system overview.</p> <p>b)Technical information and specifications for all PCS hardware components</p> <p>c)Proof of Class approval of the hardware package proposed</p> <p>d)Drawings of all console panels, HMI and/or stand-alone instrumentation and controls detailing all hardware and its layout within the consoles.</p> <p>e)Description of all related system integration requirements and communication protocols applied.</p> <p>f)Detailed description of PCS control logic, functionality, and operational requirements demonstrating that all specified requirements are met.</p> <p>g)Electrical wiring diagrams indicating all power and communication cabling requirements, cable types and cable termination connection detail.</p> <p>h)Electric cable route layout presented over General Arrangement and/or Machinery Arrangement drawings.</p> <p>i)Description of software access, management, and security requirements.</p> <p>j)Description of remote access requirements and functionality</p> <p>k)Any other documentation as may be required for Class approval of the new PCS and the issuing of a Class Approved Plan for the new PCS installation on the vessel, acceptable to the TA.</p>
19.2	Alarm & Monitoring System Replacement	<p>a)Network topology,</p> <p>b)System block diagram,</p> <p>c)General system description</p> <p>d)Description of normal operator instructions and operator input options</p> <p>e)Identification of redundancies</p> <p>f)Electrical wiring drawings</p> <p>g)Electrical connection drawings</p> <p>h)Cable arrangement drawings identifying cable requirements, routing, and connections</p> <p>i)BOM for the complete system</p> <p>j)Confirmation of all software to be applied</p> <p>k)Description of all software operator access requirements, any operator software access restrictions and how they are managed.</p> <p>l)Complete I/O list with description of functionality at each</p> <p>m)Description of all control functions</p> <p>n)Description of Power Management philosophy to be applied, definition of functional controls and integration detail between CCAMS and all related systems</p> <p>o)Failure Modes and Effects Analysis of all control functionality of the new CCAMS and overall approach to Power Management</p> <p>p)Preliminary HMI page presentation drawings or images</p> <p>q)Any other documentation as required for system approval by Class.</p>
19.3		
19.4		
19.5	MCR Console Refurbishment	<p>The MCRCD =documentation package must include:</p> <p>a)MCR console layout proposal drawings based on detail of all new hardware requirements as defined in each related specification items. The final mounting and positioning of all items, equipment must be laid out on drawings, to a scale of 1:25, for review and acceptance by the CG TA.</p> <p>b)The integrated system must be arranged with sufficient redundancy and/or segregation so as to prevent loss of control, monitoring or alarm functions for multiple main functions upon a single failure.</p> <p>c)Revision and or modification of the proposed layout of consoles and the associated components, based on the inputs from Canada.</p>
19.6		<p>The MCRCD documentation package must include:</p> <p>a)MCR console layout proposal drawings based on detail of all new hardware requirements as defined in each related specification items. The final mounting and positioning of all items, equipment must be laid out on drawings, to a scale of 1:25, for review and acceptance by the CG TA.</p> <p>b)The integrated system must be arranged with sufficient redundancy and/or segregation so as to prevent loss of control, monitoring or alarm functions for multiple main functions upon a single failure.</p> <p>c)Revision and or modification of the proposed layout of consoles and the associated components, based on the inputs from Canada.</p> <p>d)Once the Design has been completed, a copy of the design report is to be provided to Canada for final verification and confirmation.</p> <p>e)The design must meet the requirements of both Class and TCMSS and the Contractor must be responsible for the development and producing of the required construction and installation drawings needed, as well as any submissions to Class (ABS) for approvals.</p>

DESIGN REVIEW MEETINGS DELIVERABLES TABLE, REV 2			
ITEMS		PDR - Preliminary Design Review Meeting PRELIMINARY DOCUMENTS	CDR - Critical Design Review Meeting FINAL DOCUMENTS
19.7	Wheelhouse Layout & Console Rework	<p>The documentation package must include:</p> <p>a) Console layout proposal drawings based on detail of all new hardware requirements as defined in each related specification items. The final mounting and positioning of all items, equipment must be laid out on drawings, to a scale of 1:25, for review and acceptance by the CG TA.</p> <p>b) Revision and or modification of the proposed layout of consoles and the associated components, based on the inputs from Canada.</p>	<p>The documentation package must include:</p> <p>a) Console layout proposal drawings based on detail of all new hardware requirements as defined in each related specification items. The final mounting and positioning of all items, equipment must be laid out on drawings, to a scale of 1:25, for review and acceptance by the CG TA.</p> <p>b) Revision and or modification of the proposed layout of consoles and the associated components, based on the inputs from Canada.</p> <p>c) Once the Design has been completed, a copy of the design report is to be provided to Canada for final verification and confirmation.</p> <p>d) The design must meet the requirements of both Class and TCMSS and the Contractor must be responsible for the development and producing of the required construction and installation drawings needed, as well as any submissions to Class (ABS) for approvals.</p>