

CLASS ANNUAL SURVEY/ INTERMEDIATE SURVEY/ SPECIAL SURVEY/ GENERAL EXAMINATION* CHECKLIST FOR GAS CARRIER

Ship Name:

Report No.:

I.R. No.:

DOCUMENTATION
<p>STATUTORY CERTIFICATES Valid Statutory certificates available on board.</p>
<p>APPROVED TRIM & STABILITY INFORMATION Confirmation of availability of trim and stability booklet approved by administration.</p>
<p>MANOEUVRING BOOKLET Confirming that the manoeuvring booklet is on board and that the manoeuvring information is displayed on the navigating bridge</p>
<p>FIRE CONTROL PLANS Verification of proper posting of fire control plans (including duplicate sets permanently stored in a prominently marked weathertight enclosures outside deckhouse</p>
<p>STEERING GEAR ENTRIES REQUIRED BY SOLAS/FLAG Verification of entries made in the ship's log for departure steering checks & Emergency steering drills.</p>
<p>DAMAGE STABILITY Availability of damage stability information.</p>
<p>LOADING MANUAL Verified that vessel has an approved Loading Manual.</p>
<p>I.G. SYSTEM OPERATIONAL MANUAL Verification for availability of I.G. Instruction manual (operation, maintenance, safety, health hazard etc.)</p>
<p>DAMAGE CONTROL PLANS & BOOKLET Verification that damage control plan and booklet are available. (Note: Applicable for vessels of 500 GT and over, keel laid on or after 01/01/2009.)</p>
<p>CARGO TANK RELIEF VALVES Verification of certificate for cargo tank relief valve setting and sealing of the relief valves giving details regarding place, date and certifying authority for setting of relief valves</p>
<p>NATIONAL REQUIREMENTS / CODE Availability of applicable code (Note: (IGC-for ships whose keel was laid on or after 01-06-1986 / GC Code for ships built before 01-06-1986 but after 31-12-1976) or National requirements and Material Safety Data sheets for the carriage of cargoes)</p>
<p>CONSTRUCTION DRAWINGS MAINTAINED ON BOARD Confirming that structural alterations performed, if any, have been approved by the classification society and reported on the as-built drawings kept on board (Note: applicable for ship constructed on or after 1st Jan. 2007)</p>
<p>DOCUMENT OF APPROVAL FOR STABILITY INSTRUMENT Confirm vessel is provided with DOA for stability instrument (Note: Applicable for new vessel keel laid on or after 01/07/2016 and existing vessel first renewal survey after 01/07/2016)</p>
<p>EMERGENCY TOWING PROCEDURES Confirm that ship specific emergency towing procedures available on board.</p>
<p>COATING TECHNICAL FILE Confirm that Coating technical file is available on board and maintained. (Note: Applicable for ships of not less than 500 gross tonnage provided with dedicated seawater ballast tanks for which the building contract is placed on or after 01/07/2008 or the keels of which are laid on or after 01/01/2009 or which are delivered on or after 01/07/2012.)</p>
<p>SHIP CONSTRUCTION FILE Confirmation that Ship Construction File is available and maintained onboard.</p>
<p>ALTERNATIVE DESIGN & ARRANGEMENT Confirm that where applicable, the approved documentation for alternative design and arrangement is on board</p>

Condition to be reported using number code as follows:

1. When examined found to be satisfactory and/or examined/tested satisfactory and/or confirmed arrangements exist in satisfactory condition. No repairs considered necessary this time.
2. Repairs now recommended and were carried out satisfactorily. After repairs found to be satisfactory and/or examined / tested satisfactorily and/or confirmed arrangements exist in satisfactory condition.
3. Repairs now recommended and remain outstanding.
4. Opportunity to examine/test was not provided this time. Remains outstanding.

NA - Not Applicable.

<p>CARGO INFORMATION Information available on board for the each cargo carried giving data for the safe carriage of cargo</p>
<p>CARGO CONTAINMENT SYSTEM Records of the performance of the cargo containment system is available on board</p>
<p>HARMONIC DISTORTION RECORD FOR VESSEL FITTED WITH HARMONIC FILTER. Verification of annual measurement record of harmonic distortion level at bus bar (Applicable for vessel keel laid before 1 July 2017 and for any modification on electrical distribution system on existing vessel, total distortion measured along with equipment running at the time of measurement to be recorded)</p>
<p>OPERATIONAL MANUAL FOR EFFECT OF HARMONIC FILTER Verification that following document are available on board.</p> <ol style="list-style-type: none"> 1) Effect of failure on harmonic filter on electrical distribution system. 2) Permitted modes of operation for maintaining harmonic distortion level within acceptable limit during normal operation and during failure of filter. 3) Approved copy of relaxation on allowable distortion limit, if any 4) Record of harmonic distortion level measured. <p>(Note: Applicable for vessel keel laid on or after 01 July 2017 and on exiting ship retrofitted with harmonic filter on or after 01 July 2017.)</p>
<p>CLASS CERTIFICATE Confirmation that the survey/general examination* completed satisfactorily and Certificate extended/Full -Term certificate/ Full-Term Certificate endorsed/interim certificate issued/short term certificate issued*</p>
<p>WEATHER DECK</p>
<p>GAS DOMES, SUPERSTRUCTURES, DECKHOUSES & WHEELHOUSES Verification of sealing arrangements at gas domes, gas tight condition of wheelhouse doors and windows, fixed type side scuttles and windows in superstructure and deckhouse ends facing the cargo area and gas tight bulkhead penetrations.</p>
<p>ACCOMMODATION & SERVICE SPACES VENTILATION & AIRLOCKS Verification of accommodation, control station / service spaces ventilation system for proper operation and condition of closing devices to air intakes and outlet (to be internally operated in case of carriage of toxic gasses) and airlocks to forward service spaces with access falling in gas dangerous space</p>
<p>SPACES NOT NORMALLY ENTERED Verification of ventilation arrangements (may be portable ventilation) provided for spaces not normally entered such as hold spaces, interbarrier spaces, void spaces, cofferdams, spaces containing cargo piping and other spaces where cargo vapour could accumulate</p>
<p>VENTILATION OF SPACES IN THE CARGO AREA NORMALLY ENTERED DURING CARGO HANDLING Examine that arrangement of mechanical ventilation of space in satisfactory condition and verified its controlled from outside space, Warning notice placed, it's in fixed and negative pressure type, Permitted extraction from lower upper part of when appropriate for compressor room, pump rooms and cargo control rooms when considered gas-dangerous , it's positive type for spaces, containing electric motors driving cargo compressor or pumps and other gas safe space with cargo area, exhaust dusts are clear of the ventilation inlet and opening to Accommodation space, service space control station and other gas free area</p>
<p>CARGO & PROCESS PIPING AND FITTINGS Examination of condition of cargo, bunker, ballast and vent piping system including PRVs, vacuum relief valves, vent masts and headers and devices to prevent the passage of flame on vents to all bunker, hold and void spaces, as far as practicable,. Confirmation that the PRVs are type-approved or marked with date of testing. The verification to include condition of removable pipe lengths/other approved equipment necessary for cargo operation. Examination of liquid & vapour hoses. Examination of process piping insulation form hull structure, pressure relief and drainage arrangements and water curtain protection as appropriate including Expansion arrangements.</p>
<p>SPECIAL SPACES Verification of closing and other arrangements of any special enclosed space provided for the protection of the crew in the event of a major cargo release including nearby decontamination showers</p>
<p>DRIP TRAYS Availability of portable or fixed drip trays or insulation of deck plating as protection against cargo leakage</p>
<p>FIRE DOORS AND CONTROLS a. Examination of manual/automatic fire doors, verification of their satisfactory operation and confirmation that no</p>

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NA - Not Applicable.

holding back arrangements exist and arrangements for self-closing & locking are in order.
b. Confirmation that fire doors provided between machinery space and steering gear compartment are of gastight, self-closing type and without any hold back arrangements. (Note: applicable where emergency fire pump is in steering gear compartment)
ANCHORING & MOORING EQUIPMENT Examining the anchoring equipment & mooring equipment. At renewal survey, during the examination, anchors are lowered and raised using the windlass.
SOUNDING PIPES Sounding pipes, including self closing devices on short sounding pipes
HATCHWAYS Examination and testing of hatchways on freeboard and superstructure decks including efficient condition of closing appliances
WEATHER DECKS Examination of weather decks, shipside plating above waterline and confirm heating arrangement is in order if any for steel structure provided
HULL MARKINGS Verification that hull markings such as freeboard markings, draft markings, vessel name, IMO number, port of registry are legible and in satisfactory condition.
VENTILATORS Examination and or testing of ventilators including efficiency of their closing appliances
SCUPPERS, SANITARY DISCHARGES, VALVES AND CONTROLS Examination scuppers and sanitary discharges and valves together with valves and their control gear
SKYLIGHTS AND FIDDLEY OPENINGS Examination and or testing of skylights and fiddley openings including their closing appliances
EXPOSED CASINGS, DECK HOUSES, COMPANION WAYS AND SUPERSTRUCTURES Examination and / testing of exposed casings, deck houses, companionways and superstructure bulkheads including closing appliances.
TIGHTNESS TESTING OF CLOSING APPLIANCES Where tightness testing of closing appliances such as hatches, doors, etc. is carried out with ultrasonic equipment, confirmation that firm engaged in tightness testing is approved. Name of the firm:..... IRS approval certificate Number..... Validity.....
THICKNESS MEASUREMENT Where thickness measurements on structure/plating of the vessel is carried out, confirmation that firm engaged in thickness measurement on vessel is approved. Name of the firm:..... IRS approval certificate Number..... Validity.....
REMOTE INSPECTION TECHNIQUES (RIT) Where remote inspection techniques are used in survey, confirmation that firm engaged for RIT is approved. Name of the firm:..... IRS approval certificate Number..... Validity.....
NON-DESTRUCTIVE TESTING (NDT) Where NDT carried out onboard, confirmation that the firm providing NDT services is approved. Name of the firm:..... IRS approval certificate Number..... Validity.....
GUARD RAILS AND/OR BULWARKS Examination of the condition and arrangement
SEA WATER PIPE EXPANSION JOINTS Examining visually the condition of any expansion joints in sea water system
COLLISION & WATERTIGHT BULKHEAD OPENINGS Examining the collision and the other watertight bulkheads as far as can be seen. Watertight bulkheads penetrations examination as far as practicable for satisfactory condition

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<p>BILGE, BALLAST AND OIL FUEL ARRANGEMENTS Examining, as far as practicable, the bilge, ballast and oil fuel arrangements</p>
<p>MASTS AND STANDING RIGGING Masts, Derricks & Crane columns including their standing rigging</p>
<p>COMPANIONWAYS Verification of Companionways and posting of appropriate notices.</p>
<p>AIR PIPES Examination and or testing of air pipes including efficiency of their closing appliances, weld connection between Air pipes and deck plating. Examining and Confirming that vents from bunker tanks and ballast tanks (with cathodic protection) are equipped with flame screens and mesh provided are in satisfactory condition.</p>
<p>FREEING PORTS Examination of the condition and arrangement including shutters and crew protection bars</p>
<p>GANGWAY, LIFELINES AND MEANS OF EMBARKATION/ DISEMBARKATION a. Satisfactory examination of various items pertaining to lifelines, accommodation ladder, gangways, Davits, Winches. Verification of inspection and maintenance records. b. Confirmation that embarkation ladder and accommodation ladder including safety net are in satisfactory condition and marked with safe working load.</p>
<p>EMERGENCY TOWING ARRANGEMENT Examining the towing arrangements and verification of operational readiness (Applicable for vessels of 20,000 DWT and above)</p>
<p>SAFE ACCESS TO BOW Examining arrangements of safe access to bow including trends, side stringer cross members, decking, deck plate, stanchion, rigid hand rails, hand ropes, support points, shelter and confirmation that it is constructed of fire resistant and non slip material.</p>
<p>TOWING AND MOORING EQUIPMENT Confirming that the towing and mooring equipment is properly marked with any restriction associated with its safe operation for ships constructed on or after 01/01/2007</p>
<p>BOW OR STERN LOADING/UNLOADING ARRANGEMENTS. Examining when applicable bow or stern loading and unloading arrangements with particular reference to the electrical equipment, fire fighting arrangements and communication between the cargo control room and shore location.</p>
<p>NEW INSTALLATION OF MATERIALS CONTAINING ASBESTOS Confirming that new equipment containing asbestos was not fitted on board since last survey.</p>
<p>INTERNAL SPACES Verification of the permanent means of access where appropriate of the internal spaces as far as practicable.</p>
<p>UPGRADATION / REPAIR TO COATING Confirmation that maintenance, repair and partial recoating had been done as per manufacturer's specification using acceptable coating system, suitable surface preparation and adequate film thickness under the supervision of coating manufacturer's representative/coating inspector. These had been verified through stage/patrol inspection during survey and considered acceptable. (Note: Ballast tank for which coating condition was upgraded to "GOOD" this time during survey are to be listed in the "Remark" section.)</p>
<p>LOADING INSTRUMENT Availability of an approved loading instrument together with its operational manual and verification of test cases [Capable of verifying compliance with intact and damage stability requirement as per MSC 370(93). (Note: Applicable for new vessel keel laid on or after 01/07/2016 and existing vessel first renewal survey after 01/07/2016)</p>
<p>COATING TECHNICAL FILE Confirming that maintenance, repair and partial coating of dedicated ballast tanks, as appropriate, are recorded in the coating technical file and the maintenance of the protective coating is included in the overall ship's maintenance scheme.</p>

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3. Repairs now recommended and remain outstanding.
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NA - Not Applicable.

MACHINERY SPACES

MACHINERY AND BOILER SPACES

Confirming that the machinery, boilers and other pressure vessels, associated piping systems and fittings are so installed and protected so as to reduce to a minimum any danger to persons on board, due regard being given to moving parts, hot surfaces and other hazards

FIRE/EXPLOSION HAZARDS

a. i) Propulsion system and auxiliary machinery, boilers, all pressurized systems (steam, pneumatic, hydraulic) and their associated fittings were examined to see whether they are being properly maintained and with particular attention to the fire and explosion hazards

ii) Verification that oil / water leakages, accumulation of oil, with potential source of ignition does not exist in the machinery spaces. Leakages if any have been dealt and source of leakages rectified.

iii) Confirmation that floor plates & gratings are secured and found to be in order.

b. Confirmation that lagging material on hot surfaces, anti-splash tapes on joints are in place as required and high-pressure fuel lines are jacketed and spray shields flanged/screwed joints of pipes are in satisfactory condition.

c. Confirmation that arrangement for high pressure fuel oil leak off alarm for propulsion engine, auxiliary engines or any other diesel engines are satisfactory and operational. Drain lines are connected to alarm unit and working satisfactory.

d. Where flexible hoses/pipes are used, examination of hoses/pipes for any signs of material cracking or deterioration to ensure that, there is no damage, cut, kinked, crushed, twisted, hardened, cracked hoses/pipes exists in the oil systems.

e. Confirmation that the supports and retaining devices of low-pressure fuel system provides adequate restraint and are in satisfactory condition.

STEERING GEAR

a. All main and auxiliary steering arrangements and their associated equipment and control systems were examined and tested. Steering chains are verified for wear and tear and it was ensured wear is within 12% of the original rule diameter. Confirmation that various alarms required for hydraulic power operated, electric and electro-hydraulic steering gears are, operating satisfactorily and that the recharging arrangements for hydraulic power operated steering gears are being maintained. Log entries made in accordance with statutory requirements were verified where applicable Confirming that various alarms are operating satisfactorily.

Confirm, that the required arrangement to regain steering capability in the event of the prescribed single failure is maintained

b. Confirmation that steering gear compartment is in satisfactory condition and provided with handrail arrangements, grating or non-slip surface.

MEANS OF COMMUNICATION

All means of communication between the navigating bridge and the machinery control positions including engine room telegraph, as well as the bridge and the main / alternative steering position, if fitted, are tested. Where ships having emergency steering positions there are means of relaying heading information and, when appropriate, supplying visual compass readings to the emergency steering positions. Confirmation that means of indicating the angular position of the rudder are operational.

BOILERS AND PRESSURE VESSELS

Periodical Surveys of boilers and other pressure vessels have been carried out as required by the Rules and the safety devices have been tested. External visual examination. External examination of boilers including test of safety & protective devices and test of safety valve using it's relieving gear. For exhaust gas economisers, review of engine log book to verify that Chief Engineer has tested the safety valves at sea within the window period of Annual Survey

REMOTE CONTROLS

Examining the means for the operation of the main and auxiliary machinery essential for propulsion and the safety of the ship, including when applicable, the means of remotely controlling the propulsion machinery from the navigating bridge (including the control, monitoring, reporting, alert and safety actions) and the arrangements to operate the main and other machinery from a machinery control room

BILGE PUMPING ARRANGEMENT

Examination of the bilge pumping systems and bilge wells including operation of each bilge pump (including hand pumps and eductors), extended spindles and level alarms, where fitted. Operational confirmation of emergency bilge suction and bilge-pumping system for each watertight compartment and drainage from enclosed cargo spaces situated on freeboard deck.

FIRST START ARRANGEMENT

Operational confirmation of the means provided to bring the machinery into operation from the dead ship condition without external aid

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3. Repairs now recommended and remain outstanding.
4. Opportunity to examine/test was not provided this time. Remains outstanding.

NA - Not Applicable.

<p>AUTOMATION General Examination of automation equipment. Operation of safety Devices, bilge level detection and alarm systems and control systems. Examination and testing of the general emergency alarm system and confirmation of the engineer's alarm that it is clearly audible in the engineer's accommodation</p>
<p>SCHEDULE OF BATTERIES Schedule of batteries for essential and emergency services available on board and maintenance being done as per this schedule.</p>
<p>NORMAL OPERATION OF PROPULSION MACHINERY Confirming that the normal operation of the propulsion machinery can be sustained or restored even though one of the essential auxiliaries becomes inoperative</p>
<p>MACHINERY SPACE VENTILLATION Confirmation that machinery space ventilation is in good working condition.</p>
<p>EMERGENCY GENERATOR ROOM VENTILATORS ARRANGEMENT Verification that following requirement of emergency generator room ventilation louvers and its closing appliance examined/ tested and found satisfactory.</p> <ol style="list-style-type: none"> Manual or power operation of louvers and its closing appliance. Operating instruction, where hand –operated system is in use Automatic opening of ventilation louvers whenever emergency generator starting/ in operation for power operated system where provided including fail to open operation.. Manual closing operation from outside the space, where open /closed indication clearly marked. <p>(Note: Applicable for vessel keel laid on or after 01 January 2017)</p>
<p>CARGO USE AS A FUEL Examining, when applicable the arrangement for the use of cargo as fuel and testing, as far as practicable that the gas supply to the machinery space is cut off, in case the exhaust ventilation not functioning correctly and that master gas fuel valve may be remotely closed from within the Machinery space</p>
<p>MACHINERY VERIFICATION RUNS Towards completion of Special/Continuous Survey of Machinery, trial of main & auxiliary machinery including the steering gear & controls carried out to confirm satisfactory operation (In afloat condition). For Controllable Pitch Propeller, confirmation that pitch position indicators are working satisfactorily from remote and emergency position, onboard record of hydraulic oil analysis is available and servo oil low pressure and high temperature alarms are operational and oil level in the tank is maintained.</p>
<p>SEA TRIAL In case of major repairs to main propulsion machinery or steering gear, confirmation that a sea trial has been carried out satisfactorily to confirm proper operation of the relevant machinery in all respects. (Note: In case of major repairs to main propulsion machinery or steering gear, the scope of sea trial is to also include a test plan for astern response characteristics based on those required for such an equipment or system when fitted to the new ship. The tests are to be carried out at least over the manoeuvring range of the propulsion system and from all control positions. A test plan is to be provided by the manufacturer and accepted by the surveyor. If specific operational characteristics have been defined by the manufacturer, same is to be included in the test plan and the reversing characteristics of the propulsion plant, including the blade pitch control system of controllable pitch propellers, are to be demonstrated and recorded during trials.)</p>
<p>ELECTRICAL INSTALLATION</p>
<p>ELECTRICAL EQUIPMENT IN GAS DANGEROUS SPACES / ZONES Confirming that electrical equipment and cables in gas dangerous spaces and zones is suitable for such locations, is in satisfactory condition and properly maintained. The electric motors driving ventilation fans are positioned outside ventilation duct when carriage of flammable product is intended and the ventilation fan and the ducts, in way of fans only, are of non sparking construction in gas dangerous spaces</p>
<p>INSULATION RESISTANCE Verification of insulation resistance of electrical equipment and cables in the gas dangerous spaces and zones (immediate past records may be accepted when the ship is not in a gas free state) where applicable, the Pipelines and Independent cargo tanks are Electrically bonded to Hull.</p>
<p>ELECTRICAL SYSTEM a.General examination visually and in operation, as feasible, of the main electrical machinery, the emergency sources of electrical power, the switch gear, other electrical equipment including the lighting system. The precautions provided against</p>

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- Repairs now recommended and remain outstanding.
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NA - Not Applicable.

shock, fire and other hazards of electrical origin for proper maintenance.			
b. Confirmation that light covers including emergency lights are in satisfactory condition.			
c. Confirmation that 440 V/ 220 V panels are not showing low insulation resistance.			
d. Confirmation that insulation mat is provided around the electrical switch board, panels.			
EMERGENCY SOURCE OF POWER			
The operation of the emergency source(s) of electrical power, including their starting arrangement, the systems supplied, and when appropriate, their automatic operation as far as practicable. Examining the emergency lighting in all electric motor rooms for cargo pump			
MONITORING OF HARMONIC DISTORTATION			
Confirmation that equipment for continuous monitoring of harmonic distortion level is in good order, alarm tested, logging of measured value verified in engine log book or electronically in case where automation system fitted and found to satisfactory. (Note: Applicable for vessel keel laid on or after 01 July 2017 and on exiting ship retrofitted with harmonic filter on or after 01 July 2017.)			
PROTECTION ARRANGEMENT FOR HARMONIC FILTER			
Confirmation that protection for harmonic filter, including alarm tested and found satisfactory. (Note: Applicable for vessel keel laid on or after 01 July 2017 and on exiting ship retrofitted with harmonic filter on or after 01 July 2017.)			
ADDITIONAL REQUIREMENTS FOR IMPRESSED CURRENT CATHODIC PROTECTION (ICCP) SYSTEMS			
DOCUMENTATION AND RECORDS			
1. Confirmation that ICCP Manual is available onboard and attachments details of anodes and reference electrodes along with specification of connecting cables are available for reference.			
2. Confirmation that record of system operation is maintained and downtime if any is recorded. Confirmation that all anode current outputs and potentials monitored are similar to those settled during previous assessment.			
3. Confirmation from records that ICCP system is maintained and adjusted by the supplier on regular basis as per manufacturer's instructions.			
SYSTEM OPERATION			
Confirmation that system is in operation and working satisfactory. Confirmation that operation of indicators and control on the panel including auto/manual switch are found to be satisfactory.			
PROTECTION ARRANGEMENT FOR ANODE CABLES			
Confirmation that protection arrangement for ICCP anode cables is in satisfactory condition.			
ALTERNATIVE DESIGN AND ARRANGEMENT			
Where applicable, examination of alternative design and arrangement for machinery or electrical installations or fire safety, in accordance with the test inspection and maintenance requirements if any specified in the approved documentation is to be carried out			
FIREFIGHTING ARRANGEMENTS			
SERVICING OF FIREFIGHTING APPLIANCES			
Verification of evidences for proper maintenance and servicing of firefighting appliances.			
No.	Item	Inspection Type	Date Last Done
1	Breathing apparatus	Examination	
		Testing	
2	Portable/ Semi-portable Fire Extinguishers	Examination	
		Testing	
3	Fixed Fire Extinguishing System (CO ₂ / Halon/ Foam/ DCP/ Other* (specify),,,,,,,)		
	CO ₂	Weighment	
		5 Yearly servicing	
		10 Yearly servicing	
		Testing	
		Examination	
	Halon	Container Content Verified	
Servicing			

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		Container Pressure Testing	
		Examination	
	Foam	Sample Testing	
		Examination	
	DCP	Testing	
		Examination	
	Other (Specify).....	Testing	
		Examination	
4	Fireman's outfit	Examination	
5	International Shore Coupling	Examination	

WATER SPRAY SYSTEM
Verification of water spray system including remote starting of pumps and remote operation of any normally closed valves in the system and its means are clearly marked

DRY POWDER EXTINGUISHING SYSTEM
Verification of condition of dry powder extinguishing system including hand hoses, fixed piping, monitors, pressurizing medium, dry chemical powder and local and or remote controls and its means are clearly marked.

CARGO COMPRESSOR AND PUMP ROOMS
Verification of carbon dioxide or any other appropriate fire extinguishing system for cargo compressor and pump rooms and its operation clearly marked

FIXED CARBON DIOXIDE FIRE-EXTINGUISHING SYSTEMS
Examination of the fixed carbon dioxide fire-extinguishing systems for the protection of machinery spaces, cargo pump-rooms and gas dangerous spaces. Where applicable, are provided with two separate controls, one for opening of the gas piping and one for discharging the gas from the storage container, each of them located in a release box clearly identified for the particular space.

MAIN AND EMERGENCY FIRE PUMP
a. Verification that each main fire pump (including starting and priming arrangements) is capable of producing the required two jets of water simultaneously (whilst also permitting the simultaneous operation of foam system on tankers) at any part of the ship whilst the required pressure is maintained in the fire main (All cargo area and containment area) including testing of remote means of starting one main fire pump
b. Confirmation that emergency fire pump including prime mover and priming arrangements, gauges are in satisfactory condition and pump is building required water pressure and two jets of water simultaneously.
Tested pressure :bar

FIREMAINS, HYDRANTS, HOSES, NOZZLES AND APPLICATORS
Condition of fire main (no soft patches or doublers) together with flanges and valves, hydrants, hoses, nozzles, applicators, spanners, relief valves and international shore connection

READINESS OF FIRE HYDRANTS, HOSES
Each hose complete with couplings, nozzle (dual-purpose nozzles where applicable) and tools kept ready for use

PORTABLE EXTINGUISHERS AND FOAM APPLICATORS
Confirmation that portable fire extinguishers correspond to the fire control plan w.r.t. number, type and location and that when examined were in good condition, fully charged and ready for use

SPARE CHARGES
Availability of spare charge/s for each portable extinguisher or additional portable extinguishers of the same type

FIRE AND/OR SMOKE DETECTION SYSTEM
a. Examine for proper functioning and possible testing, any fire detection and alarm system and any sample extraction smoke detection system
b. Confirmation that maintenance as recommended by manufacturer has been undertaken and spares available as per manufacturer's instructions for the system.

FIXED FIRE FIGHTING SYSTEM
i) Examination of fire fighting system (including fixed fire fighting system for the enclosed cargo machinery spaces and enclosed cargo motor room within the cargo area) controls, piping, instructions and marking. Confirmation that its means of operations is clearly marked. Checking for evidence of proper maintenance and servicing including date of last

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systems tests ii) Verification with regard to correct positioning (for in service condition) of safety pins where used on cylinder head discharge valves for fixed fire fighting CO2 system are in accordance with manufacture's instruction manual.
REMOTE STOPPING OF FANS, OIL PUMPS, VALVES ETC a. Verify that the remote controls for stopping fans and machinery in machinery spaces are in working order. Examination of the arrangements for oil fuel, lubricating oil and other flammable oils and testing the remote closing of valves for oil fuel, lubricating oil and other flammable oils and the operation of the remote means of closing the valves on the tanks that contain oil fuel, lubricating oil and other flammable oils. b. Confirmation that quick closing valves are in satisfactory condition and no valve is isolated/disconnected and operating instructions are displayed.
CLOSING ARRANGEMENTS FOR SKYLIGHTS, FLAPS ETC Examination of closing arrangements of ventilators, funnel annular Spaces, skylights, doorways and tunnel where applicable, including Condition of operating mechanism e.g.: wire ropes, hydraulic piping etc. for cargo space
FIREMAN'S OUTFITS Confirmation that the fire fighters' outfits including its self-contained compressed air breathing apparatus and emergency escape breathing devices (EEBDs) are complete and in good condition and that the cylinders, including the spare cylinders, of any required self-contained breathing apparatus are suitably charged, and that on board means of recharging breathing apparatus cylinders used during drills or a suitable number of spare cylinders to replace those used are provided, and provision of two-way portable radiotelephone apparatus of an explosion-proof type or intrinsically safe
FIRE DAMPERS AND VENTILATION SYSTEMS Testing the fire dampers of ventilation ducts and the means of closing the main inlets and outlets of all ventilations systems and testing the means of stopping power ventilation systems from outside the space served.
MEANS OF ESCAPE a. Confirmation that the means of escape from accommodation, machinery and other spaces are satisfactory b. Confirmation that opening of escape doors are in the way of direction of escape, handrails are provided in the corridors that are being used as escape routes and none of the doors along any designated escape routes require keys to unlock them when moving in the direction of escape.
GASEOUS FUEL FOR DOMESTIC PURPOSE Examining the arrangements for gaseous fuel for domestic purposes.
INERT GAS / DRY AIR SYSTEM
ENVIRONMENTAL CONTROL Verification of arrangements for safe purging of cargo tanks, and arrangements for environmental control within interbarrier and hold spaces in case of tanks other than type C independent tanks or within surrounding spaces of type C independent tanks including monitoring arrangements comprising gas sampling points, pressure relief valves and pressure monitoring Automation and alarm system
INERT GAS GENERATION SYSTEM Verification of functional readiness of inert gas generation system, together with alarms and controls including arrangements to prevent cargo vapours entering machinery space or other spaces outside cargo tank area, when the inert gas generator is fitted in these spaces.
DRY AIR SYSTEM Verification of dry air system together with the vapour detection system for the spaces being controlled and rapid inerting arrangement
INERT GAS USAGE Confirming that use of inert gas has not increased beyond that needed to compensate for normal losses by examining records of inert gas usage.
CARRIAGE OF INERT GAS Confirming that when applicable arrangements are made for sufficient inert gas to be carried to compensate for normal losses and that means are provided for monitoring the spaces.
CARGO HANDLING / CARGO CONTROL ROOMS
CARGO CONTROL ROOM Examining the cargo control room
CARGO TANK GAUGING SYSTEM & EMERGENCY SHUTDOWN SYSTEM Verification of cargo tank liquid level gauges, high level alarms and automatic high- liquid-level shut-off system including manually operated emergency shut-down (ESD) system together with automatic shutdown of cargo pumps and compressors

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NA - Not Applicable.

(ESD need not be tested during cargo transfer). Examining, and testing, the liquid level indicators, overflow control, pressure gauges, high pressure and, when applicable, low pressure alarms, and temperature indicating devices for the cargo tanks
CARGO TANK & INTERBARRIER SPACES Verification of cargo tank and interbarrier space pressure and vacuum relief valves including associated gauging, safety system and alarms
CLOSING OPENINGS IN THE SHELL PLATING Examination that the arrangements for closing openings in the shell plating below the freeboard deck
GAS DETECTION EQUIPMENT Verification of test and calibration status of cargo gas leak detection equipment using span gas and test of alarm (30% LEL alarm to be tested with span gas), two set of Portable gas detection equipment suitable for cargoes to be carried and suitable instrument for measuring oxygen is provided
CARGO CONTAINMENT SYSTEM Verification of cargo containment system & associated equipment together with any associated shut down and/ or interlock temperature and pressure indicating equipment, including when fitted the thermal oxidation systems and any refrigeration system together with any associated alarms. Verification of records of cold spot examination at the surrounding structures of wing tank, double bottom tank & cofferdam. Examining the insulation and means of support of the cargo tanks and confirming that the secondary barrier remains effective
CARGO AND PROCESS PIPE LINE Cargo pipelines, valves and fittings especially expansion bellows, supports & vapour seals on installed pipes to examine.
HOSES Liquid and vapour hoses should be suitable for their intended purpose type approved or mark with date of testing
CARGO PUMP AND COMPRESSOR ROOMS AND ENVIRONMENT CONTROL
SHIP CONSTRUCTION FILE Examination, for bulk carriers of 150 m and above, where appropriate, the ship's structure in accordance with the Ship Construction File, taking into account identified areas that need special attention
ENVIRONMENT CONTROL Examination of the arrangement for cargo pressure/ temperature control, including where fitted, any reliquefaction/ refrigeration system/ boil off arrangement and confirmation of associated alarms.
ELECTRICAL MOTOR ROOMS VENTILATION AND AIR LOCKS Examination of the ventilation arrangement and air locks including alarms and loss of over pressure protection
PROTECTION OF CARGO PUMP ROOMS Examining all pump room bulkheads for signs of oil leakage or fractures and, in particular, the sealing arrangements of all penetrations of cargo pump room bulkheads. Confirming that potential sources of ignition in or near the cargo pump room are eliminated, such as loose gear, combustible materials, etc., that there are no signs of undue leakage and that access ladders are in good condition. Verifying that installed pressure gauges on cargo discharge lines and level indicator systems are operational. Operation of cargo pump room bilge system and checking pump foundation all intact
CARGO PUMP ROOM VENTILATION, CLEANLINESS Etc Examination of cargo pump room(s) spaces for freeness from potential sources of ignition, access ladders and cargo pump room drainage arrangements; operation of the ventilation system (damper operation and flame screens) including interlocking arrangement to lighting
PROTECTION OF PERSONNEL
PROTECTIVE EQUIPMENT Verification of availability and condition of protective equipment including eye protection for crew engaged in cargo operations and their storage arrangement
RESPIRATORY & EYE PROTECTION EQUIPMENT Availability and condition of respiratory and eye protection equipment suitable for emergency escape for every person on board, where the ship is designated to carry certain products
DECONTAMINATION AND EYE WASH ARRANGEMENT Functional verification of decontamination and eye wash arrangements including arrangements against freezing, where the ship is designated to carry certain products
FIRST-AID EQUIPMENT Availability and condition of first aid equipment including stretchers, oxygen resuscitation equipment and antidotes for cargoes carried on board

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NA - Not Applicable.

<p>SAFETY EQUIPMENT Verification of safety equipment comprising breathing apparatus together with requisite air supplies and its storage arrangement (at least two complete sets in addition to the fire fighting requirements and additional two more complete sets where the ship's cargo carrying capacity is 2000 m3 and over and is designated to carry certain products).</p>
ADDITIONAL CLASS NOTATIONS
ADDITIONAL CLASS NOTATIONS E.G. SPM, VCS etc.
<p>‘SPM’ NOTATION Components of the single point mooring system (bow chain stoppers, bow fairleads, winches and capstans), to verify their satisfactory condition, Hull structures supporting and adjacent to the components to the single point mooring system, to verify that there is no deformation or fracture.</p>
<p>“HY (LGC)” NOTATION Machinery under working condition, to verify the shells of all pressure vessels in the system externally including condition of insulation. Primary refrigerant gas and liquid pipes, cargo vapour and liquid condensate pipes and condenser cooling water pipes, The reliquefaction/refrigerent plant spare gear.</p>
METHANE BURNING EQUIPMENT IF FITTED
<p>Following components are to be generally examined externally: - Heat exchangers and pressure vessels for use with methane burning in boilers and machinery, Cargo heaters, vaporizers, masthead heaters and other miscellaneous pressure vessels. Controls and interlock are to be checked, Alarm systems are to be checked, Exhaust fans and/or pressurizing system for gas trunking are to be tested, The relevant instruction and information material such as cargo handling plans, filling limit information, cooling down procedures etc are to be verified as being on board.</p>
GENERAL
<p>HOUSE KEEPING i) Verification that general housekeeping / cleanliness in engine room, pump room, on deck, accommodation, hospital, galley, wash basins and toilets are satisfactory. ii) Confirmation that no loose drums and no heavy items without securing/lashing on deck. iii) Confirmation that Spare anchor where provided, its lashing bracket in good condition.</p>
<p>FLAG SPECIFIC REQUIREMENTS Confirmation that flag specific requirements/instructions, if any are complied with. Please Provide details in Remark section.</p>
<p>H.O. INSTRUCTIONS Confirmation that H.O. Instructions pertaining to this survey if any communicated separately, have been compiled with. Please Provide details in Remark section.</p>
ADDITIONAL REQUIREMENTS TOWARDS INTERMEDIATE SURVEY
CARGO CONTAINMENT & CARGO HANDLING SAFETY SYSTEMS
<p>OVERALL AND CLOSE UP SURVEYS i) Confirmation that overall and close up survey of ballast tanks as required by rule based on age and type of the vessel has been carried out for satisfactory condition. (Details of finding to be provided in the report.) ii) Examination of permanent means of access for satisfactory condition, when examining internal spaces, as far as practicable.</p>
<p>HEATING ARRANGEMENTS Verification that the heating arrangements, if any, for steel structures are satisfactory.</p>
<p>CARGO AS FUEL Examining and testing where applicable/practicable, the arrangements for the use of cargo as fuel, that the gas supply to the machinery space is cut off should the exhaust ventilation not functioning correctly and that the master gas fuel valve remotely closing from the machinery space are being carried out regularly and found in satisfactory condition.</p>
<p>ELECTRICAL EQUIPMENT AND CABLES IN HAZARDOUS ZONES Examining the electrical equipment and cables in hazardous areas and zones such as cargo machinery spaces and areas adjacent to cargo tanks to confirm that are maintained in efficient condition (Note: To check for defective equipment, fixtures and wiring. Examination with reference to the following is to be carried out: -Protective earthing (spot check)</p>

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NA - Not Applicable.

<p>-Integrity of flame proof enclosures. -Damage of outer sheath of cables. -Function testing of pressurized equipment and associated alarms. - Testing of systems for de-energizing non-certified safe electrical equipment located in spaces protected by air locks, such as electrical motor-rooms, cargo control rooms, etc.)</p>
<p>INSULATION RESISTANCE Verification of insulation resistance of the circuits for satisfactory condition (Note: In cases where a proper record of testing is maintained, consideration should be given to accepting recent readings).</p>
<p>EXAMINATION OF TANKS, SPACES AND THICKNESS MEASUREMENT Confirmation that internal examination of tanks, spaces including testing and thickness measurements carried out satisfactorily as per the rule requirements and reported separately.</p>
<p align="center">ADDITIONAL REQUIREMENTS TOWARDS SPECIAL SURVEYS</p>
<p>PRESSURE RELIEF VALVES AND VACUUM RELIEF VALVES TESTING Verification that pressure relief valves and vacuum relief valves on cargo tanks and inter-barrier spaces are inspected in opened out condition and adjusted to lift at a pressure as required incl. checking of relief valve harbour settings as applicable for satisfactory condition (Note 1: Valves may be removed from shell for the purpose of making the adjustment under pressure of air or other suitable gas). Verification that pressure setting of relief valves on cargo gas and liquid pipelines checked for satisfactory condition. (Note 2: Valves may be removed from the pipelines for the purpose) (Note 3: For cargo tanks are equipped with relief valves with non-metallic membranes in the main or pilot valves, testing to be carried out in accordance with IRS Rules)</p>
<p>MOORING ROPES AND TOW LINES Confirmation that sufficient mooring ropes and tow lines as required by rules are provided onboard.</p>
<p>AIR PIPES Internal Examination of automatic air pipe heads at special survey as required by IRS Rules, Part 1.</p>
<p>MEANS OF EMBARKATION AND DISEMBARKATION Accommodation ladders, gangways and its winches incl. brake system are to be operationally tested with specified maximum operation load in accordance with IRS Rules</p>
<p>GAS TIGHT SEALS IN WAY OF BULKHEADS Confirmation that gas-tight seals with efficient lubrication or other means of ensuring the performance of the gas seal are fitted in way of the bulkhead or deck are in efficient condition (where pumps and compressors are driven by shafting through bulkhead or deck).</p>
<p>PIPING SYSTEM Examination of all bilge and ballast piping systems for satisfactory condition and operationally tested to working pressure to ensure that the tightness and condition remains satisfactory.</p>
<p>EXAMINATION OF TANKS, SPACES AND THICKNESS MEASUREMENT Confirmation that internal examination of tanks, spaces including testing and thickness measurements are carried out satisfactorily as per the rule requirements and reported separately.</p>
<p>ELECTRICAL EQUIPMENT AND CABLES IN HAZARDOUS ZONES Confirmation of electrical equipment and cables in hazardous areas and zones such as cargo machinery spaces and areas adjacent to cargo tanks are maintained in efficient condition (Note: To check for defective equipment, fixtures and wiring. Examination with reference to the following is to be carried out: -Protective earthing (spot check) -Integrity of flame proof enclosures. -Damage of outer sheath of cables. -Function testing of pressurized equipment and associated alarms. - Testing of systems for de-energizing non-certified safe electrical equipment located in spaces protected by air locks, such as electrical motor-rooms, cargo control rooms, etc.)</p>
<p>INSULATION RESISTANCE Verification of insulation resistance of the circuits for satisfactory condition (Note: In cases where a proper record of testing is maintained, consideration should be given to accepting recent readings).</p>
<p>OVERALL AND CLOSE UP SURVEYS i) Confirmation that overall and close up survey of ballast tanks as required by rule based on age and type of the vessel has</p>

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<p>been carried out for satisfactory condition. (Details of finding to be provided in the report.)</p> <p>ii) Examination of permanent means of access for satisfactory condition, when examining internal spaces, as far as practicable.</p>
<p align="center">ADDITIONAL REQUIRMENTS FOR VESSELS WITH “RV(LNG) NOTATION”</p> <p>(Note: survey of Regasification is to be carried out during unloading operation with the system in operation)</p>
<p>DOCUEMNTATION</p> <p>Examination of logbooks and operating records pertaining to regasification system to verify whether any irregularities shown in operation.</p> <p>Confirmation that relevant shipboard instructions and procedures of regasification installation are available.</p> <p>Verification of records of maintenance of vaporizers, high pressure pumps</p>
<p>VESSEL ARRANEGEMET AND STRUCTURE</p> <p>a. Following to be examined for satisfactory condition for the dedicated regasification spaces/areas:</p> <ul style="list-style-type: none"> • Areas dedicated to regasification equipment • Closing devices of air intakes and openings • Drip trays or insulation for deck protection and recesses against cargo leakages
<p>b. Examination, as far as practicable, of stripping and vent piping system and high-pressure manifolds of cargo and process including vent line drainage arrangement. Pressure testing and/or thickness measurement carried out based on condition of piping.</p> <p>(Note: Applicable for Intermediate Survey)</p>
<p>c. Internal examination of satisfactory condition of suction drums.</p> <p>Where accessible, examination of outer surface of uninsulated suction drum or the outer surface of regasification unit insulation together with any vapour or protective barrier.</p> <p>(Note: Applicable for Special Survey)</p>
<p>d. Visual examination of suction drum supporting structures including fittings, valves and safety devices in open condition including pressure testing as required.</p> <p>(Note: Applicable for Special Survey)</p>
<p>e. Verification of tightness of suction drums.</p> <p>(Note: Applicable during special survey. For ships 10 yrs old, at every alternate special survey, suctions drums are to be either hydraulically tested and thereafter nondestructively tested or subjected to thorough non-destructive testing as per rule requirement.)</p>
<p>SYSTEMS AND EQUIPMENT</p> <p>a. External examination of vaporizers and their fittings, heat exchangers for satisfactory condition. Examination of high-pressure pumps as far as practicable, suctions drum(s) and their sealing arrangements as applicable,</p>
<p>b. General examination of high-pressure pumps, cargo and process piping including the expansion arrangements, insulation from the hull structure, pressure control valves, inlet/outlet valves, drainage arrangements and high-pressure manifolds.</p>
<p>c. Confirmation that all accessible cargo piping system and components are electrically bonded to the hull and where fitted bonded straps examined.</p>
<p>d. Confirmation that thickness measurement, pressure test and/or opening up and internal examination of equipment and thickness measurement of suction drum(s) carried out where required.</p> <p>(Note: applicable for Intermediate Survey)</p>
<p>GAS HANDLING EQUIPMENT AND EQUIPMENT IN HAZARDOUS AREAS</p> <p>a. Visual examination of high-pressure pumps in opened up condition including pressure testing of their parts and component as required necessary.</p> <p>(Note: Applicable for Special Survey)</p>
<p>b. Confirmation that pressure relief valves are examined satisfactorily in opened up condition, adjusted, function tested and sealed and inlet/outlet valves, pressure control valves and discharge valves are tested satisfactorily</p> <p>(Note: Applicable for special Survey)</p>
<p>c. Confirmation that external and internal examination of vaporizers including their fittings, valves and safety devices in opened up condition including thickness measurement, pressure testing as considered necessary</p>
<p>SAFETY SYSTEMS, CONTROL, ALARMS AND MONITORING</p> <p>a. Examination of pressure gauges, control valves, metering unit, temperature and vibration indicating equipment, relief valves their sealing and associated safety systems and alarms including instrumentation fitted in regasification equipment</p>

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and in contact with gas. Confirmation the satisfactory working condition of regasification control station
b. Confirmation of satisfactory operational testing of emergency shutdown system. Testing of instrumentation satisfactorily by changing pressure, level and temperature as far as practicable and comparing with test instruments (Simulated testing may be accepted for sensors that are not accessible.) (Note: Applicable for Intermediate survey)
c. Confirmation that satisfactory testing of firefighting system carried out. (Note: Applicable for Intermediate Survey)
d. For water spraying system, examination of associated pumps in opened up condition including working test of the system. (Note: Applicable for Special survey)
FIXED GAS DETECTION EQUIPMENT Examination and testing of fixed gas detection equipment as appropriate.

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