



Indian Register of Shipping

REPORT OF INITIAL SURVEY/ANNUAL SURVEY/INTERMEDIATE SURVEY/ RENEWAL SURVEY/CHANGE OF FLAG SURVEY/GENERAL EXAMINATION*

For class notation BWE/BWT

Name of Ship:

I. R. No.:

IMO No.:

Port of Survey:

NOTES:

1	Use "Y" for Yes/Satisfactory, "N" for Not Satisfactory, "NO" for No, "NA" for Not Applicable, "P" for Remains outstanding.
2	Where any repairs or any deficiencies pending comments to be included in the remarks section.
3	During Installation surveys, all the relevant plans as applicable are to be referred. Same may be included in the remarks section.

Sr. No.	Item	Y/N/NO/NA/P
A. General		
1	Confirming that Ballast Water Management Plan approved by/on behalf of the Administration has been provided on board in the working language of the ship.	.....
2	Confirming that an officer has been designated on board as the in charge of ensuring that the plan is properly implemented.	.....
3	Confirming that Officers and crew are familiar with the ship's Ballast Water Management plan and are familiar with their duties in the implementation of Ballast Water Management System (BWMS) particular to the ship.	.....
4	Confirming that the Ballast Water Record Book has been provided.	.....
5	Exemption where granted by the Administration confirming that same has been recorded in the Ballast Water Record Book.	.....
6	Where Ballast Water Management System(s) have been fitted on ship for compliance with Reg.D-2, confirming that certificate(s) for type approval for the system(s) is/are available on board.	.....
7	Confirming that a statement has been provided by the Administration, or from a laboratory authorized by the Administration, confirming that the electrical and electronic components of the ballast water management system(s) have been type-tested in accordance with the specifications for environmental testing contained in part 3 of the annex of the applicable Guidelines for approval of ballast water management systems (G8).	.....
8	Confirming that safety data sheet for the chemicals (Active Substance) including instructions on how to use, safety procedure and personal protective equipment have been provided on board and crew is aware of same.	.....
9	Confirming that equipment manuals for major components of the ballast water management system(s).	.....
10	Confirming that an operations and technical manual for the ballast water management system(s) specific to the ship and approved by the Administration, containing a technical description of the ballast water management system(s), operational and maintenance procedures, and backup procedures in case of equipment malfunction has been provided.	.....
11	Verifying that all software changes introduced to the BWMS Control and Monitoring equipment after the pre-test evaluation are done according to a change handling procedure for traceability.	.....
B. Initial Survey (Ballast Water Treatment System)		
1	General	
1.1	Confirming that ballast water tank arrangement and capacity as provided on the ship correspond to the capacity plan.	.....
1.2	Confirming that the internal arrangement of ballast tanks are such as to minimize accumulation of sediments e.g. adequate provision of scallops and drain holes, absence of stagnant pool or sediment traps, minimal horizontal surfaces, arrangement for effective flushing.	.....
1.3	Confirming that safe access is provided in Ballast Tanks to allow sediment removal and sampling.	.....
1.4	Confirming that the ballast water pumping and piping system including location of inlets and outlets, provision of high sea suction points on each side, provision for removal of suspended matter, provision of discharges and arrangement for stripping the tanks correspond to the approved plan.	.....

1.5	Confirming that arrangement exists for discharging Ballast Water to a reception facility in line with the approved plan and the connections for ballast transfer in particular the sections related to flanges and connection methods are compatible with a recognized standard such as those in the Oil Companies International Marine Forum (OCIMF) “Recommendations for Oil Tankers Manifolds and Associated Equipment”.	.....
1.6	Where tanks have been designated as permanent ballast carried in sealed tanks, confirming that these have been so identified in the approved Ballast Water Management Plan including Trim & Stability and Loading manuals and the transfer arrangement if provided have been sealed effectively to avoid unintended discharge of ballast water. Appropriate notices have been displayed to this effect.	.....
1.7	Confirming that the BWMS(s) installed on or after 28 October 2020 are approved in accordance with the BWMS Code, as may be amended; and confirming that the BWMS(s) installed before 28 October 2020 are approved taking into account the guidelines developed by the Organization or the BWMS Code, as may be amended.	.....
2	Installation checks:	
2.1	Confirming that installation commissioning procedures for the ballast water management system(s) have been provided.	.....
2.2	Verifying that the BWMS installation conforms to the manufacturer’s equipment specification, installation specification and the approved plans.	.....
2.3	Verifying that the ballast water management system is in conformity with the Type Approval Certificate of BWMS. (Note: BWMS(s) installed on or after 28 October 2020 are to be approved in accordance with the BWMS Code, as may be amended.)	.....
2.4	Verifying the certificates for following BWMS’s components inspected and certified at the manufacturing facility: <ul style="list-style-type: none"> • pressure vessels, • piping class I or II, • filters, • switchboards	.....
2.5	Confirming that initial calibration procedures of the ballast water management System (s) have been provided and a valid calibration certificate issued by manufacturer or person authorized by the manufacturer is available on board.	.....
2.6	Confirming that the flow rate capacity of the ballast system as installed on board correspond to approved plan and does not exceed the Treatment Rated Capacity specified in the Type Approval Certificate.	.....
2.7	Confirming that provision for avoiding over pressurization of ballast tanks or ballast piping have been made in line with the approved plans.	.....
2.8	Confirming that suitable by-pass or override arrangement has been provided as per approved plan, for the system to be operated in case of an emergency or conditions as permitted under Regulation A-3.	.....
2.9	For BWMS requiring treatment of ballast water at both intake and discharge, Confirming that water stripped from ballast tanks is also passed through the required treatment process. (Note: Chemical based BWMS requiring neutralization of the residual oxidants prior discharge of ballast water, arrangement ensuring effectiveness of neutralization is to be confirmed based on the approved ballast water stripping system design and operation.)	.....
2.10	Confirming that based on the initial Risk Assessment carried out, mitigating measures have been put in place/implemented.	.....
2.11	Confirming that BWMR is equipped with gastight and self closing doors without holding back arrangements (Note: <ol style="list-style-type: none"> 1. Applicable for following types of BWMS: <ul style="list-style-type: none"> • BWMS storing, introducing or generating chemical substances • De-oxygenation based on inert gas generator • Electrolysis • Ozone injection 2. Doors leading to open deck need not be self closing)	.....
2.12	Confirming that where a fixed fire-extinguishing system is installed in the BWMR, automatic shutdown of the BWMS upon release of the fixed fire extinguishing system is arranged and in satisfactory condition.	.....

2.13	Where the BWMS is installed in an independent compartment, Confirming that the compartment complies with following:	
2.13.1	Provided with fire integrity equivalent to other machinery spaces based on approved plan.	.....
2.13.2	Provided with fire detection, firefighting as per fire control plan.	.....
2.13.3	Positioned outside of any combustible, corrosive, toxic, or hazardous areas unless otherwise specifically approved.	.....
2.14	Where BWMS or its components are required to be installed in a non-hazardous area but the compartment containing these components are located in a hazardous area, confirming that following provisions are satisfied:	
2.14.1	Deck and bulkhead penetrations are sealed gas tight.	.....
2.14.2	No part of the ballast water piping is located in the compartment.	.....
2.14.3	No source of release of gas e.g. flange connection/valves are located in the compartment.	.....
2.14.4	Access to the compartment from hazardous area is through two gastight self closing doors with air lock capable of maintaining a positive pressure. Provision for audible and visual alarm at control station for loss of pressure in the air lock and safety interlock for cutting out electrical supply due to loss of pressure. (Note: No air lock however will be required where a vertical separation of at least 2.4m is maintained between the flooring of the compartment and main deck plating or a cofferdam is provided in between the compartment and main deck.)	.....
2.14.5	Ventilation inlet and outlets are located outside hazardous area.	.....
2.15	Confirming in respect of the Piping system:	
2.15.1	Valves, piping fittings and flanges fitted in the system are as per approved plan.	.....
2.15.2	Where plastic pipes have been accepted for use, these are to meet the specification as in IMO Res.A.753(18) with regard to strength, fire endurance, flame spread etc.	.....
2.15.3	Where non-metallic expansion joint/s are fitted in piping system which penetrates the ship's side and both penetration and non-metallic expansion joint are located below the deepest load water line, an additional information has been recommended, for the expansion joint/s to be inspected at periodical surveys and to be replaced at interval as specified by the manufacturer.	.....
2.15.4	Pipe joints are of welded type except for connections to shut off valves or double walled pipes or pipes in ducts equipped with mechanical exhaust ventilation (except where it is demonstrated that risk of leakage is minimized and the formation of toxic or flammable atmosphere is prevented and accepted, refer approved plan).	.....
2.15.5	Location of the piping system is away from heat sources and protected from mechanical damage.	.....
2.15.6	Where there is interconnection of ballast piping between hazardous areas and in nonhazardous areas, an appropriate isolation arrangement is provided as per approved plan.	.....
2.15.7	Confirmation that a suitable protection device is provided (i.e. P/V valves, P/V breakers, P/V breather valves or pressure safety relief valve or high/low pressure alarms) where a vacuum or overpressure may occur in the ballast piping or in the ballast piping or in the ballast tanks due to the height difference or injection of inert gas or nitrogen (N ₂) and the setting verified in accordance with approved plan/manufacturer's recommendation.	.....
2.15.8	Bulkhead/deck penetrations or penetrations of the ballast system piping are to the relevant approved standards.	.....
2.15.9	Provision for extended spindle or portable pump for operation of the submerged valves in ballast systems (if any).	.....
2.15.10	Where the piping is conveying active substances, by-products or neutralizers that are containing dangerous gas or dangerous liquids, Confirming that:	
2.15.10.1	Confirmation that Mechanical exhaust ventilation arrangement for inside double walled space or pipe ducts constructed is leading to a safe location on open deck and in satisfactory condition.	.....
2.15.10.2	Arrangement of pipes carrying acids is in satisfactory condition so as to avoid any projection on crew in case of a leakage.	.....
2.15.10.3	Confirmation that H ₂ by-product enriched air vent pipes or O ₂ enriched air vent pipes or O ₃ piping are not routed through accommodation spaces, services spaces and control stations and that air vent pipes for H ₂ by-product and O ₂ are as short and straight as possible)	.....
2.15.10.4	Where O ₂ enriched air vent pipes are routed through hazardous areas, confirming that the arrangement for double walled pipes or pipe ducts is in satisfactory condition and gas detection and mechanical exhaust ventilation are working satisfactorily.	.....
2.15.10.5	Confirming that pressure loss across the BWMS does not reduce the ability of the ballast system to supply at an acceptable flow rate to a remote ballast tank.	.....

2.16	System specific requirements	
2.16.1	In-line UV or UV + Advanced Oxidation Technology (AOT) or UV + TiO2 or UV + Plasma	
2.16.1.1	Confirming that arrangements provided to avoid exposure to UV light during operation, maintenance or repairs of the system are in satisfactory condition.	.....
2.16.1.2	Confirming that high temperature alarm, provision for shut down, UV intensity meter, means to prevent operation of UV lamps without water in treatment chamber are working satisfactorily and verified that the alarm /shutdown parameter are set at values specified in the approved drawing/manufacturer's recommendation.	.....
2.16.1.3	Confirming that overcurrent or overvoltage protection in UV type BWMS is operating satisfactorily.	.....
2.16.2	In-line Flocculation	
2.16.2.1	De-oxygenation 1. In-line membrane separation and de-oxygenation (injection of N2 from a N2 Generator) 2. In-line de-oxygenation (injection of Inert Gas from Inert Gas Generator) 3. In-tank de-oxygenation with Inert Gas Generator	.....
2.16.2.2	Confirming the satisfactory arrangement for discharge of the inert gas or nitrogen product enriched air from the inert gas system and from the protection devices installed on the ballast tanks (i.e., P/V valves, P/V breakers or P/V breather valves) to a safe location on the open deck as per approved plan.	.....
2.16.2.3	Confirming that the signboards or similar warnings at the discharge areas are provided and are visible.	.....
2.16.2.4	Confirming that de-oxygenation BWMS located outside the cargo area are in satisfactory condition. (Note: Applicable for Tankers where de-oxygenation using inert gas generator by treated flue gas from main or auxiliary boilers or gas from an oil or gas-fired gas generator is carried out.)	.....
2.16.2.5	Confirming that audio and visual alarms provided inside the space, at the entry into the space and inside BWMS control station are working satisfactorily and set at a value as per approved drawing/manufacturer's recommendation. (Note: 1. Applicable for spaces where inert gas generator systems are fitted or nitrogen generators are fitted. 2. At least two oxygen sensors are required to be positioned to alarm when the oxygen level falls below 19%. )	.....
2.16.3	In-line full flow electrolysis	
2.16.3.1.1	Confirming that the hydrogen de-gas arrangement is as per approved drawing and in satisfactory working condition.	.....
2.16.3.1.2	Confirming that the ventilation fan is certified explosion proof and spark arrestor is in order.	.....
2.16.3.1.3	Confirming that audible and visual alarms for high level of H2 concentration and automatic shut-down of the BWMS for high-high levels of H2 concentration are set at a level as per approved drawing/manufacturer's recommendation and working satisfactorily	.....
2.16.3.2	Confirming that the open end of the hydrogen by-product enriched gas relieving device is led to a safe location on open deck as per approved plan.	.....
2.16.3.3	Confirming that interlock arrangement provided is in satisfactorily working so that the system cannot be energized if the water level /flow is less.	.....
2.16.3.4.1	Confirming that independent means of monitoring operation of electrolysis reactors are working in satisfactorily.	.....
2.16.3.4.2	Confirming that audible and visual alarms and automatic shutdown of the BWMS are working in satisfactorily in the event that an anomaly is detected.	.....
2.16.4	In-line side stream electrolysis	
2.16.4.1.1	Confirming that the hydrogen de-gas arrangement is as per approved drawing and in satisfactory working condition.	.....
2.16.4.1.2	Confirming that the ventilation fan is certified explosion proof and spark arrestor is in order.	.....
2.16.4.1.3	Confirming that audible and visual alarms for high level of H2 concentration and automatic shut-down of the BWMS for high-high levels of H2 concentration are working satisfactorily	.....
2.16.4.2	Confirming that the open end of the hydrogen by-product enriched gas relieving device is led to a safe location on open deck.	.....
2.16.4.3	Confirming that interlock arrangement has been provided so that the system cannot be energized if the water level /flow is less.	.....
2.16.5	In-line (stored) chemical injection	
2.16.5.1.1	Confirming that the hydrogen de-gas arrangement along with redundant ventilation fans and redundant monitoring of the ventilation system are in satisfactory working condition.	.....
2.16.5.1.2	Confirming that the ventilation fan is certified explosion proof and spark arrestor is in order.	.....

2.16.5.1.3	Confirming that audible and visual alarms for high level of H2 concentration and automatic shut-down of the BWMS for high-high levels of H2 concentration are working satisfactorily	.....
2.16.5.2	Confirming that the open end of the hydrogen by-product enriched gas relieving device is led to a safe location on open deck.	.....
2.16.6	In-line side-stream ozone injection without gas/liquid separation tank and without Discharge treatment tank In-line side-stream ozone injection with gas/liquid separation tank and Discharge water treatment tank	
2.16.6.1	Confirming that BWMS are located outside the cargo area as per approved plan and are in satisfactory condition. (Note: Applicable for Tankers.)	.....
2.16.6.2.1	Confirming that arrangement to access the Ozone-based BWMS located room are in satisfactory condition. (Note: 1. To be in dedicated compartment, separated from any other space by gastight boundaries. 2. Access to the BWMR from any other enclosed space are through airlock only, except if the only access to that space is from the open deck.)	.....
2.16.6.2.2	Where access is provided through engine room. Confirmation that airlock is being maintained and alarm repeater in BWMR working in order.	.....
2.16.6.3	Confirming that a warning sign and necessary instructions to be followed prior entry are affixed on the door to warn the personnel regarding presence of ozone.	.....
2.16.6.4.1	Confirming that oxygen sensors provided in the following spaces and set at value as per approved drawing /manufacturer's recommendation and are in satisfactory condition and - spaces where ozone generators are fitted, or - spaces where ozone destructors are fitted, or - spaces where ozone piping is routed; .	.....
2.16.6.4.2	Confirming that audible and visual alarms for rise in oxygen level are working in order and activated at - inside the space; and - at the entry into the space; and - inside the BWMS control station.	.....
2.16.6.5.1	Confirming that audible and visual alarms independent from other alarms, are being activated prior to the shut-down of BWMS.	.....
2.16.6.5.2	Confirming the when the oxygen level raises above 25%; automatic shut-down of the BWMS is working satisfactorily.	.....
2.16.6.6.1	Confirming that audible and visual alarms for increase in ozone concentration above 0.1 ppm are working satisfactorily.	.....
2.16.6.6.2	Confirming the satisfactory working of the automatic shut-down of the BWMS when the ozone concentration measured inside the space raises above 0.2 ppm.	.....
2.16.6.7	Confirming that a fixed fire detection and fire alarm system installed in spaces containing an inert gas generator or an ozone generator is in satisfactory condition.	.....
2.16.6.8	Confirming satisfactory condition of fixed fire extinguishing systems and its manual release provided for BWMR containing equipment related to ozone-based BWMS.	.....
2.16.6.9	Confirming the satisfactory condition of supports, foundations, protective screens of ventilation ducts serving BWMR for ozone-based BWMS along with its operation.	.....
2.16.7	In-tank pasteurization and de-oxygenation with N2 generator	
2.16.7.1	Confirming that audible and visual alarms provided for low oxygen level in spaces where nitrogen generators are fitted are working in order.	.....
2.16.7.2	Confirming the satisfactory operation of ventilation exhaust for BWMR containing a nitrogen generator.	.....
2.16.8	BWMS using Active Substance	
2.16.8.1	Confirming that, sufficient active substance(s) are provided on board.	.....
2.16.8.2	Confirming that, dosage instruction for active substances or preparations are available on board.	.....
2.16.8.3	Confirming that storage of the active substance(s) is satisfactory taking into account the risks/hazards involved with the substance as provided in the safety data sheet.	.....
2.16.8.4	Confirming that the materials used for the chemical storage tanks, piping and fittings are resistant to such chemicals.	.....
2.16.8.5	Confirming that separate pumping and piping system is used for chemicals and arrangements verified satisfactorily.	.....
2.16.8.6	Confirming that chemical storage tanks are of sufficient strength, provided with gauging system, protected against overflowing and constructed such that maintenance and inspection can be easily performed.	.....

2.16.8.7	Confirming that air pipes for the chemical storage tank are led to a safe area on open deck.	.....
2.16.8.8	Confirming that an operation manual containing chemical injection procedures, alarm systems, measures in case of emergency, etc. is provided onboard.	.....
2.16.9	Confirming that arrangement for storage of the chemical substances inside integral tanks, is satisfactory (Note: The ship's shell plating does not form any boundary of the tank.)	.....
2.16.10	Confirming that spill trays provided for dangerous liquid storage tanks and their associated components like pumps and filters, along with secondary containment system of sufficient volume are in satisfactory condition.	.....
2.16.11	Confirming that arrangement of tanks containing chemicals are as per approved plan. (Note: - These are to be segregated from accommodation, service spaces, control stations, machinery spaces not related to the BWMS and from drinking water and stores for human consumption by means of a cofferdam, void space, cargo pump-room, empty tank, oil fuel storage tank, BWMR or other similar space. - On-deck stowage of permanently attached deck tanks or installation of independent tanks in otherwise empty hold spaces should be considered as satisfying this provision.)	.....
2.17	Arrangement for Ventilation:	
2.17.1	Confirming that an adequate power ventilation system provided in enclosed BWMR and Blower capacity is as per approved plan. (Note: Where the BWMS is installed in a separate compartment which is not a hazardous area and does not serve any ballast tanks considered to be hazardous, the compartment is to be provided with a mechanical ventilation system capable of at least 6 air changes per hour or as specified by the BWMS manufacturer, whichever is greater.)	.....
2.17.2	Confirming that the satisfactory operation of ventilation system as required. (Note: - The capacity is at least 30 air changes per hour where explosive or toxic gases may be generated during operation of the BWMS) - Flocculation-type BWMS: 6 air changes per hour - De-oxygenation, incl. pasteurization and de-oxygenation : 6 air changes per hour - Full flow electrolysis: 6 air changes per hour - Side-stream electrolysis: 20 air changes per hour - Ozone injection: 20 air changes per hour - Chemical injection: 6 air changes per hour)	.....
2.17.3	Confirming that the BWMS when fitted in hazardous area, regardless of whether or not it generates dangerous gas, is located in a space fitted with mechanical ventilation complying with relevant requirements, e.g. IEC60092- 502, IBC Code, IGC Code requirements, etc.	.....
2.17.4	Confirming that the ventilation systems for BWMR containing BWMS of the following types are as per approved drawing and independent of the ventilation systems serving any other spaces and are working satisfactorily. - BWMS storing, introducing or generating chemical substances. - De-oxygenation, including pasteurization and de-oxygenation - Electrolysis - Ozone injection	.....
2.17.5	In cases where ventilation system for BWMR containing ozone-based BWMS or ventilation system for hydrogen de gas arrangement are interlocked with the BWMS:	
2.17.5.1	Confirming the audible and visual alarms for loss of ventilation are set at a value as per approved drawing/manufacturer's recommendation and are working satisfactorily.	.....
2.17.5.2	Confirming that auto shut-down of BWMS is working satisfactorily.	.....
2.17.5.3	Confirming the satisfactory operational condition of interlock for BWMR and BWMS so as to avoid starting of BWMS without ventilation running.	.....
2.18	Sampling Facility	
2.18.1	Confirming that sampling facilities are provided as mentioned in the approved Ballast Water Management Plan and so arranged in order to collect representative samples of the ship's ballast water from the ballast water management system(s) intake(s), or from a location before the ballast discharge points and any other points necessary for sampling. (Note: In-tank sampling may be used if ballast water treatment occurs on uptake prior to or whilst ballast water is in the tank. This method of sampling is ideal when tanks are emptied through direct overboard discharge valves. Sampling to determine compliance with Regulation D-2 should be carried out in the ballast water discharge line near the discharge point.)	.....

2.18.2	Sampling point for ballast water containing dangerous gas, where located in a non-hazardous area confirming that following requirements are fulfilled:	
2.18.2.1	The sampling facility is located within a gas tight enclosure (cabinet).	.....
2.18.2.2	In the cabinet, a stop valve is installed in each sample pipe.	.....
2.18.2.3	Gas detection equipment is installed in the cabinet and the stop valves in sample pipes are automatically closed upon activation of the gas detection equipment.	.....
2.18.2.4	Audible and visual alarm signals are activated both locally and at the BWMS control station when the concentration of explosive gases reaches a pre-set value, which is not higher than 30% of the lower flammable limit (LFL) of the concerned product.	.....
2.18.2.5	The measuring system is installed as close as possible to the bulkhead facing the cargo area, and the length of measuring pipe in any safe area is as short as possible.	.....
2.18.2.6	Stop valves are located in the safe area, in both the suction and return pipes close to the penetrations through the bulkhead facing the cargo area.	.....
2.18.2.7	Warning plate stating "Keep valve closed when not performing measurements" is posted near the valves.	.....
2.18.2.8	In order to prevent backflow, a water seal or equivalent arrangement is installed on the hazardous area side of the return pipe.	.....
2.18.2.9	Safety valve is installed on the hazardous area side of each sampling pipe.	.....
2.18.2.10	Sampled ballast water is returned to a part of the system or to the ballast tank.	.....
2.18.2.11	Confirming the satisfactory arrangement for venting of the cabinet to a safe location in non-hazardous area on open deck along with a flame arrester.	.....
2.18.2.12	Confirming that the discharge of samples extracted from ballast water piping serving the tanks within cargo area is done in such a way that these are not discharged to a tank located outside the cargo area and not discharged to a piping line supplying the spaces located outside the cargo area.	.....
2.19	Electrical system and Controls	
2.19.1	Confirming that the electrical and control equipment for BWMS conforms to the manufacturer's equipment specification, installation specification and the approved plans.	.....
2.19.2	Confirming that the installation of electrical & control equipment has been carried out satisfactorily. Necessary protection as per specification is provided including earthing protection for equipment or components /bonding provision for control of static electricity.	.....
2.19.3	Confirming that remote control valves, where fitted, are arranged so that they will close and remain closed in the event of a loss of control power or emergency shutdown unless manual operation of the valve is possible.	.....
2.19.4	Confirming that ship's generator/s are able to cater to the additional load for BWMS. (Note: For retrofit installation to existing ships, a revised electrical load analysis with preferential trips of non-essential services can be accepted.)	.....
2.19.5	Where computer based system is used, confirming that the system has been approved and installation and operation has been verified satisfactorily. (Note: The control system is to be tested in accordance with approved test program.)	.....
2.19.6	Confirming that electric and electronic components which are installed in a hazardous area are of certified safe type for use in the area. Interlock with ventilation arrangement for the compartment is provided. Cable penetrations of decks and bulkheads are sealed.	.....
2.19.7	Confirming that calibration of the Control and Monitoring Equipment has been carried out as per manufacturer's instructions and records to this effect are available on board.	.....
2.19.8	Confirming that in case of any by-pass or override operation of BWMS, an audible and visual alarm has been provided and these events are automatically recorded in control equipment. The valves in the by-pass line which trigger the by-pass operation are remote-controllable by control equipment or fitted with open/close indicator for automatic detection of the by-pass event.	.....
2.19.9	Confirming that the BWMS incorporates control equipment that automatically monitors and adjusts necessary treatment dosages or intensities or other aspects of the BWMS.	.....
2.19.10	Confirming that the control and monitoring equipment is able to produce (e.g. display, print or export) a report of the applicable self-monitoring parameters for official inspections or maintenance, as required.	.....
2.19.11	Confirming that the control and monitoring equipment is able to store data for at least 24 months.	.....
2.19.12	Confirming the satisfactory operation of an automatic shutdown of the BWMS.	.....
2.19.13	Confirming the satisfactory operation of high level alarm and automatic shut-down of the BWMS at the high-high level provided for H2 leakage, O2 leakage or O3 leakage and the value is set as per approved drawing / manufacturer's recommendation (Note: 1. Applicable where double walled spaces or pipe ducts are fitted.	.....

	2. As an alternative to the sensor for the gas detection, monitored under-pressurization inside the double walled spaces or pipe ducts could be provided with an automatic alarm and shut-down of the BWMS in case of loss of the under-pressurization. The monitoring can be achieved either by monitoring the pressure inside the double walled spaces or pipe ducts or by monitoring the exhaust fan.)	
2.19.14	Confirmation that high level alarms and high-high level automatic shut down of BWMS working satisfactorily.	.....
2.20	Operational verification	
2.20.1	Confirming the satisfactory installation and operation test of the ballast water management system.	.....
2.20.2	Verifying to confirm the satisfactory operation of the control and monitoring equipment including operation of audible and visual alarms and examination of records of the proper functioning or failure of the BWMS.	.....
2.20.3	Confirming that, System Design Limitation (SDL) parameters are monitored and recorded by the BWMS to ensure proper operation.	.....
2.20.4	Confirming that suitable bypasses or overrides to protect the safety of the ship and personnel and to effectively isolate BWMS from any essential ship system to which it is connected are installed and used in the event of an emergency and these are connected to the BWMS so that any bypass of the BWMS activates an alarm. The bypass events are recorded by the control and monitoring equipment and within the ballast water record book.	.....
2.20.5	Confirming that operation of ballast water management recording device(s) is satisfactory and adequate supply of consumables for the recording device(s) are provided on board.	.....
2.20.6	Verifying that an operational test of the ballast water management system was carried out based on the installation commissioning procedures and that documented evidence is provided which shows compliance of the treated discharge ballast water during the above mentioned test with regulation D-2 through sampling and analysis based on latest revision of BWM.2/Circ.70.	.....
2.20.7	Confirming (From 1 June 2022 or earlier as required by Flag Administration), that a commissioning test has been conducted to validate the installation of any ballast water management system by demonstrating that its mechanical, physical, chemical and biological processes are working properly, taking into account BWM.2/Circ.70/Rev.1. (Note: If the commissioning test cannot be successfully carried out immediately after BWMS installation due to the ambient condition and equipment's system design limitation, then a short term IBWMC may be issued as advised by Flag Administration.)	.....
2.20.8	Verifying that installation commissioning procedures have been completed based on latest revision of BWM.2/Circ.70.	.....
2.20.9	Verifying that in case the maximum capacity of the ballast pump(s) exceeds the maximum treatment rated Capacity (TRC) of the BWMS specified in the Type Approval certificate, there is a limitation on maximum allowable flow rate for operating the ballast pump(s) that does not exceed the maximum TRC of the BWMS.	.....
2.21	Personal Protection Equipment	
2.21.1	Confirming that Suitable protection equipment are available onboard for the protection of the crew members who are engaged in the servicing, maintenance and repair of BWMS storing, introducing or generating chemicals, as recommended by the product manufacturers (Note: This protection equipment is to be provided separately without taking into account equipment required by other mandatory requirements.)	.....
2.21.2	Confirming that decontamination showers and eyewash are available onboard as required.	.....
2.21.3	Confirming that an emergency escape breathing apparatus (EEBD) is provided in the BWMR in accordance with approved Fire Control Plan. (Note: 1. This emergency escape breathing apparatus may be one of the EEBDs provided in accordance with the requirements of SOLAS II-2/13. 2. An EEBD need not be required for BWMS of UV type.)	.....
2.21.4	Confirming that a personal ozone detector, calibrated as per the manufacturer's specifications, is provided for each person engaged in the servicing, maintenance and repair of BWMS utilizing ozone	.....
2.21.5	Confirming that a two-way portable radiotelephone apparatus dedicated for the BWMS service, maintenance and repair is provided, in addition to those required by SOLAS for fire-fighting purposes. (Note: 1. This two-way radiotelephone apparatus is to be properly identified in order to avoid mix-up with the apparatus intended for fire-fighting operations.	.....

	2. Where the BWMS may release explosive gases, this two-way radiotelephone apparatus is to be of a certified safe type suitable for use in zone 1 hazardous areas, as defined in IEC Publication 60079. 3. A two-way portable radiotelephone apparatus need not be required for BWMS of UV Type.)	
C. Annual Survey (BWT)		
1	Confirming that no unauthorized alteration or modification has been done to the original arrangement including no changes to electrical, controls & monitoring system or hardware and software (version) for computer based systems.	.....
2	Confirming that where any new equipment has been fitted, it has been approved before installation and that any changes are reflected in the certificate.	.....
3	A general external examination of the structure, equipment, systems, fittings, arrangements and material/ process associated with the ballast water management plan, carried out satisfactorily in order to confirm that the BWMS has been maintained and remain in compliance with the requirements of the Convention.	.....
4	Confirming that an examination of non-metallic expansion joints if any in the piping system which penetrates the ship's side and both penetration and non-metallic expansion joint are located below the deepest load water line, has been carried out and these found to be satisfactory. Verification of records showed that these have been replaced at interval as specified by the manufacturer. Last renewal date (dd/mm/yyyy).....	.....
5	Checking whether appropriate entries have been made in the Ballast Record Book.	.....
6	Verification to confirm the satisfactory operation of the control and monitoring equipment including examination of records of the proper functioning or failure of the BWMS carried out and found to be satisfactory.	.....
7	Confirming that, System Design Limitation (SDL) parameters are monitored and recorded by the BWMS to ensure proper operation.	.....
8	Confirming that when bypasses or overrides used in the event of an emergency, the bypass events are recorded by the control and monitoring equipment and within the ballast water record book.	.....
9	Verifying that in the event the control and monitoring equipment is replaced, means are provided to ensure the data recorded prior to replacement remains available on board for 24 months.	.....
10	Confirming that the records of the recording device fitted are satisfactory and adequate supply of consumables for the recording device(s) are available on board.	.....
11	Confirming that a calibration check has been performed in accordance with the approved manual and a valid calibration certificate is available on board.	.....
12	For systems using Active Substance	
12.1	Confirming that active substance(s) in accordance with the manufacturer's recommendations are provided on board.	.....
12.2	Confirming that dosage instruction for active substance(s) or preparations are available on board.	.....
12.3	Confirming that storage of the active substance(s) is satisfactory taking into account the risks/hazards involved with the substance as provided in the safety data sheet.	.....
12.4	Examining externally the ballast water treatment system including chemical storage tanks, piping and fittings and confirming as far as practicable its satisfactory operation.	.....
13	Examining that the sediment management arrangement and control of all valves and each ballast pumps are in satisfactory condition.	.....
14	Personal Protection Equipment	
14.1	Confirming that Suitable protection equipment are available onboard for the protection of the crew members who are engaged in the servicing, maintenance and repair of BWMS storing, introducing or generating chemicals, as recommended by the product manufacturers (Note: This protection equipment is to be provided separately without taking into account equipment required by other mandatory requirements.)	.....
14.2	Confirming that decontamination showers and eyewash are available onboard as required.	.....
14.3	Confirming that an emergency escape breathing apparatus (EEBD) is provided in the BWMR in accordance with approved Fire Control Plan. (Note: 1. This emergency escape breathing apparatus may be one of the EEBDs provided in accordance with the requirements of SOLAS II-2/13. 2. An EEBD need not be required for BWMS of UV type.)	.....

14.4	Confirming that a personal ozone detector, calibrated as per the manufacturer's specifications, is provided for each person engaged in the servicing, maintenance and repair of BWMS utilizing ozone	.....
14.5	Confirming that a two-way portable radiotelephone apparatus dedicated for the BWMS service, maintenance and repair is provided, in addition to those required by SOLAS for fire-fighting purposes. (Note: 1. This two-way radiotelephone apparatus is to be properly identified in order to avoid mix-up with the apparatus intended for fire-fighting operations. 2. Where the BWMS may release explosive gases, this two-way radiotelephone apparatus is to be of a certified safe type suitable for use in zone 1 hazardous areas, as defined in IEC Publication 60079. 3. A two-way portable radiotelephone apparatus need not be required for BWMS of UV Type.)	.....
D. Intermediate Survey (to be filled, in addition to all check items for Annual surveys) (BWT)		
1	Examination of the ballast water management system for obvious defects, deterioration or damage including examination of associated pumps, piping and fittings for wear and corrosion and confirming that these found to be satisfactory.	.....
E. Special Survey (to be filled, in addition to all check items for Annual & Intermediate surveys) (BWT)		
1	Confirming that the operation (by simulation test or equivalent) of the ballast water management system found to be satisfactory.	.....
2	Confirming satisfactory performance of the BWMS components that take measurements in accordance with manufacturer's instructions.	.....
3	Verifying that a valid calibration certificate from the manufacturer or persons authorized by the manufacturer is available on board for BWMS components that take measurements.	.....
F. Initial Survey (BWE)		
1	General	
1.1	Confirming that ballast water tank arrangement and capacity as provided on the ship correspond to the capacity plan.	.....
1.2	Confirming that the internal arrangement of ballast tanks are such as to minimize accumulation of sediments e.g. adequate provision of scallops and drain holes, absence of stagnant pool or sediment traps, minimal horizontal surfaces, arrangement for effective flushing.	.....
1.3	Confirming that safe access is provided in Ballast Tanks to allow sediment removal and sampling.	.....
1.4	Confirming that the ballast water pumping and piping system including location of intakes, provision of high sea suction points on each side, provision for removal of suspended matter, provision of discharges and arrangement for stripping the tanks correspond to the approved plan.	.....
1.5	Confirming that arrangement exists for discharging Ballast Water to a reception facility in line with the approved plan and the connections for ballast transfer in particular the sections related to flanges and connection methods are compatible with a recognized standard such as those in the Oil Companies International Marine Forum (OCIMF) "Recommendations for Oil Tankers Manifolds and Associated Equipment".	.....
1.6	Where tanks have been designated as permanent ballast carried in sealed tanks, confirming that these have been so identified in the approved Ballast Water Management Plan including Trim & Stability and Loading manuals and the transfer arrangement if provided have been sealed effectively to avoid unintended discharge of ballast water. Appropriate notices have been displayed to this effect.	.....
2	Process checks:	
2.1	Flow Through Method	
2.1.1	Confirming that tank volume, available pumps and estimated time, corresponding to volume three times the tank volume is included in ballast water management plan.	.....
2.1.2	Confirming that calculation is available on board that tank is not being subjected to pressure greater than design pressure during flow through method.	.....
2.1.3	Confirm that air vents fitted on ballast tank are approved for such method, if not provision provided for prevention of overflow.	.....
2.2	Dilution Method	
2.2.1	Confirming that tank volume, available pumps and estimated time, corresponding to a volume three times the tank volume is included in ballast water management plan.	.....
2.2.2	Confirming that monitoring system to monitor the level in tanks fitted where maintenance of constant level is essential to the safety of ship during BWE.	.....
2.3	Sequential Method	
2.3.1	Confirming that loading condition, compliance with stability and strength requirement for each step in the ballast is available on board.	.....

2.4	Sampling Facility	
2.4.1	Confirming that sampling facilities are provided as mentioned in the approved Ballast Water Management Plan and so arranged in order to collect representative samples of the ship's ballast water.	.....
G. Annual Survey (BWE)		
1	Examining and verifying that sediment management arrangement and control of all valves and each pump required for ballast water exchange is in satisfactory condition.	.....
2	Confirming that control system for dilution method is in satisfactory condition, if applicable.	.....
3	Confirming that the ballast water pumping and piping system including location of intakes, provision of high sea suction points on each side, provision for removal of suspended matter, provision of discharges and arrangement for stripping the tanks in satisfactory condition.	.....
4	Checking whether appropriate entries have been made in the Ballast Record Book.	.....
H. Intermediate Survey (to be filled, in addition to all check items for Annual surveys) (BWE)		
1	Confirming that accessibility of sampling point and in satisfactory condition.	.....
2	Confirming of satisfactory operation of tank level indicating system, valve position indicating system, draught indicating system and communication to local control station at central ballast control station.	.....
I. Special Survey (to be filled, in addition to all check items for Annual & Intermediate surveys) (BWE)		
1	Confirming of satisfactory operation of local and remote control at each pump used during ballast water exchange.	.....
2	Confirm that manually operated independent means of control of all valves required for ballast water exchange are in satisfactory condition.	.....
3	Examining and verifying that the function of control, monitoring and communication system on the ballast control station including tank level indicating system, valve position indicating system, draught indicating system and communication to local control station are in satisfactory condition.	.....
J. Recommendation		
1	Confirming that the Class Rule requirements with respect to the additional class notation are complied with and hence the class notation to be assigned/ retained.	.....
Remarks:		

Surveyor(s) to Indian Register of Shipping

Date:

Place: