NOTICE OF THE MARITIME SAFETY ADMINISTRATION OF CHAINA

Document No. 5

**Notice of the China MSA on the Special Campaign to Prevent Marine Mechanical and Electrical Equipment Failures**

To implement the three-year action plan for addressing the root causes of water safety and to further enhance the safety level of vessels, reduce the risk of mechanical and electrical equipment failures, and prevent and curb the occurrence of water traffic accidents, China MSA has decided to carry out a special campaign to prevent marine mechanical and electrical equipment failures nationwide. In accordance with the provisions of the “Maritime Traffic Safety Law of the People’s Republic of China”, the “Regulations on the Safety Management of Inland Waterway Traffic of the People’s Republic of China”, and the “Rules on Vessel Safety Supervision of the People’s Republic of China”, the following matters are hereby announced:

1. **Implementation Period**

The special campaign will commence on April 7, 2024, and conclude on October 31, 2024.

1. **Self-inspection of Marine Mechanical and Electrical Equipment**

Chinese-flagged vessels should strengthen the maintenance of mechanical and electrical equipment. Shipping companies should refer to the “Guidelines for Special Self-inspection to Prevent Marine Mechanical and Electrical Equipment Failures” (attached hereafter) to develop key inspection items applicable to their vessels. Vessels should conduct pre-departure self-inspections and promptly rectify any identified issues and hazards.

Shipping agents should publicize and warn incoming foreign vessels about the campaign and urge them to carry out maintenance and inspection of mechanical and electrical equipment and identify potential hazards in advance before arrival at the port.

Chinese Classification Society, domestic vessel inspection institutions, and foreign vessel inspection institutions in China should strengthen the inspection and testing of new-built, converted, and mechanically and electrically maintained or updated vessels, improve the quality of inspections, and reduce the risk of mechanical and electrical equipment failures.

1. **Reporting of Marine Mechanical and Electrical Equipment Failures**

Vessels experiencing mechanical and electrical equipment failures should proactively report to the local maritime safety administration and accept special safety inspections as required. Non-compliance with the reporting of mechanical and electrical equipment failures will be dealt with strictly according to the law.

1. **Special Inspection of Marine Mechanical and Electrical Equipment**

Maritime safety administration at all levels should conduct detailed inspections of marine mechanical and electrical equipment in conjunction with routine safety inspections of vessels. For vessels that have experienced mechanical and electrical equipment failures, special inspections should be carried out as a matter of principle. For vessels that have experienced two or more times of mechanical and electrical equipment failures within 12 months, the maritime safety administration will invite shipping companies and vessel inspection institutions to jointly conduct inspections and require the vessels to submit failure analysis reports and preventive measures for mechanical and electrical equipment failures.

**Attachment:**

Guidelines for Special Self-inspection to Prevent Marine Mechanical and Electrical Equipment Failures

THE MARITIME SAFETY ADMINISTRATION OF CHINA

April 3, 2024

**Attachment**

**Guidelines for Special Self-inspection to Prevent Marine Mechanical and Electrical Equipment Failures**

Vessels should conduct self-inspections of the safety and technical conditions of vessels and mechanical and electrical equipment in accordance with international conventions, domestic laws, and regulations, and earnestly implement the primary responsibility for production safety.

1. **Status of the Main Propulsion (Prime Mover).**

Prevention of main propulsion failures requires self-inspection from aspects of oil, gas, water, and electricity, focusing on the fuel system, lubricating oil system, air system, cooling water system, and main engine control system, etc.

1. Is the fuel system of the main propulsion operating normally (including the fuel supply unit, high-pressure oil pump, fuel pipes, leak detection, fuel heating, automatic fuel pump switching [if applicable], etc.)?
2. Are the communication facilities such as the control console and the engine telegraph on the bridge operating normally? Are the nearby tachometers and other instruments and meters functioning properly?
3. Is the starting air system of the main propulsion operating normally (including the pressure of the main starting air bottle, main air compressor, main starting valve, cylinder air starting valve, air distributor, etc.)?
4. Is the lubrication oil system of the main engine operating normally (including checking for any signs of leakage on the pipelines and filter connections, verifying the normality of pressure gauge indications, ensuring the firmness of sensor connections, and automatic switching of lubrication oil pumps [if available], etc.)?
5. Is the cooling water system of the main engine operating normally (including checking for any signs of leakage on the pipelines and coolers, verifying the normality of pressure gauge indications, ensuring the firmness of sensor connections, and automatic switching of cooling water pumps [if applicable], etc.)?
6. Is the main engine control air piping system operating normally (including the control air pressure and checking for the presence of water in the control air system)?
7. Measures for reversing the main engine (including the blade pitch control system for controllable pitch propellers, and the clutch).
8. **Status of the Main Propulsion Safety, Monitoring, and Remote-Control Auxiliary Equipment**

Prevention of main propulsion safety system failures requires self-inspection from aspects of oil mist detectors, lubricating oil pressure loss protection, and the reliability of overspeed protection functions, etc.

1. Are the main diesel engine’s overspeed alarm and emergency stop devices operating normally?
2. Are the low-pressure lubricating oil alarm, high-temperature cylinder liner water alarm, and automatic stop protection devices for the main diesel engine functioning properly?
3. Are the main diesel engine’s oil mist detector and main bearing temperature detector operating normally? (Applicable only to seagoing vessels with diesel engine power greater than 2250KW or cylinder bore diameter larger than 300mm in unmanned machinery space)
4. Does the centralized monitoring system have any alarm records related to the main propulsion system security and automatic stop devices? (Applicable only to seagoing vessels)
5. Is the lubricating oil low-pressure alarm device for the gear transmission unit operating normally? For gear transmission units with input power greater than 1470kW, is the lubricating oil high-temperature alarm device functioning properly? (Applicable to seagoing vessels)
6. For gear transmission units with input power greater than 370KW, is the lubricating oil low-pressure alarm device operating normally? For gear transmission units with input power greater than 1470kW, is the lubricating oil high-temperature alarm device functioning properly? (Applicable only to inland river vessels)
7. **Status of Marine Steam Boiler**

Boilers can adjust oil and water temperatures through steam heating to ensure diesel engines operate within normal working ranges. To prevent boiler failures, self-inspection is recommended from aspects of the water supply system, combustion system, and safety protection, etc.

1. Is the water supply system operating normally (including the number of water pumps equipped, water quality, and water level indication devices)?
2. Is the combustion system operating normally (including ignition, fuel supply, and air supply)?
3. Is the security system operating normally (including safety valves, air supply, flame failure, and low water level alarms)?
4. **Status of Main Power Supply**

Prevention of main power supply failures requires proactive self-inspection from aspects of the prime mover, generator, and main switchboard.

1. Is the capacity of the main power supply sufficient (with special attention to single or multiple set generator failures, as well as vessels equipped with side thruster, scrubber, and ballast water treatment system)?
2. Are the starting and operation of the prime mover normal (including fuel oil, lubricating oil, and cooling water)?
3. Is the security system function of the prime mover normal (including overspeed protection, low lubricating oil pressure, high cooling water temperature, etc.)?
4. Are the main switchboard and generating sets control panels operating normally (including automatic starting, stopping, paralleling, decoupling, load distribution, and staged unloading control of the generating sets)?
5. Is the insulation monitoring function of the main switchboard operating normally?
6. **Status of Emergency Power Supply**

The emergency power (mainly the emergency generator) can serve as an independent power source for important equipment such as the steering gear when the main power supply fails. Inspections of the emergency power can be conducted from aspects of the emergency generator, emergency switchboard, and emergency battery pack, etc.

* 1. Is the starting and operation of the emergency generator normal (including fuel oil, lubricating oil, and cooling water)?
	2. Does the emergency generator starting device meet the requirements? (Applicable only to seagoing vessels)
	3. Is there sufficient reserve fuel for the emergency generator?
	4. Is the mode switch for the automatically starting emergency generator set to the automatic position?
	5. In the event of a loss of main power, can the emergency generator supply power to emergency equipment within 45 seconds as specified (or within 30 seconds for inland river vessels)?
	6. Is the insulation monitoring function of the emergency switchboard operating normally?
	7. Is the emergency battery functioning properly?
	8. Is the quick-closing valve for the emergency generator fuel oil tank operating normally?
	9. Are all load unit switches on the emergency generator switchboard in the ON position?
	10. Is the air supply pipeline (within the emergency generator room) for the compressed air cylinder of the emergency generator equipped with a check valve?
	11. Is the fuel leak alarm for the high-pressure fuel line of the emergency generator operating normally?
1. **Status of Steering Gear**

To ensure the effective operation of the steering gear, prevention of steering gear failures can be conducted from aspects of the steering gear’s electrical system, hydraulic system, alarm devices, and operations, etc.

* 1. Can the steering gear automatically start after a power outage (Applicable only to seagoing vessels)?
	2. In the event of a loss of main power, can the steering gear be supplied with power within 45 seconds (Applicable only to seagoing vessels with rudder diameters exceeding 230mm)?
	3. In the case of a single fault in the power equipment of an electrically controlled steering gear, it should be able to switch to the standby power equipment within 10 seconds. (Applicable only to inland river vessels)
	4. Is the capacity of the hydraulic oil storage tank for the steering gear sufficient to recharge at least one power actuator system (including the reservoir)?
	5. Is the low-level audible and visual alarm for the hydraulic oil reservoir of the steering gear functioning normally(in both the bridge and machinery spaces)?
	6. Are the audible and visual alarms for the steering gear (such as short-circuit protection, overload alarm, and phase failure alarm) functioning normally (at the location of the main engine or control room and bridge for normal control of the main engine)? (Applicable only to seagoing vessels)
	7. Is the steering performance test normal?
	8. Are the communication facilities between the bridge and the steering gear room in good condition?
1. **Competency and Familiarity of Crew with the Operation of Mechanical and Electrical Equipment within Their Duties**

To prevent marine mechanical and electrical equipment failures caused by human factors such as improper crew operations, self-inspection is recommended from aspects of crew certificates, vessel manning, and crew practical operations and emergency capabilities, etc.

* 1. Do the crew members hold valid Certificates of Competency, and does the vessel meet the minimum safe Manning requirements?
	2. Are the crew members able to effectively communicate in a common language during daily operations and emergency situations?
	3. Is the responsible crew member familiar with the operation, testing, and emergency response procedures of the main propulsion system (including lubricating oil system, high-temperature alarm testing for the cooling system, overspeed alarm testing, fuel sleeve failure [leakage] alarm testing, emergency stop, and main engine loss of control emergency response procedures)?
	4. Is the responsible crew member familiar with the operation, testing, and emergency response procedures of the ship’s boiler, such as low water level alarms, flame failure alarms, and air supply alarms?
	5. Is the responsible crew member familiar with the operation, testing, and emergency response procedures of the ship’s main power supply, including fuel leakage alarm testing, paralleling, and decoupling testing, insulation testing, and emergency response procedures for complete power loss?
	6. Is the responsible crew member familiar with the operation, testing, and emergency response procedures of the emergency generator, including emergency generator start-up, paralleling, and decoupling testing?
	7. Is the responsible crew member familiar with the operation, testing, and emergency response procedures of the steering gear, such as the switching of the steering system, pre-departure steering gear inspection and testing, steering gear alarm testing, and emergency steering drills?
1. **Effective Implementation of Mechanical and Electrical Equipment-related System Documents on Board**

The effective implementation of mechanical and electrical equipment-related system documents on board is an important part of preventing mechanical and electrical failures, mainly conducted from aspects of on-board resources and human resources, development of on-board operational procedures, emergency preparedness, reporting and analysis of accidents and emergencies, and maintenance of vessels and equipment, etc.

* 1. Does the shipping company ensure that the captain receives necessary support, including ship-shore communication records, spare parts and materials application and supply records, system document reports, technical support, and other necessary resources?
	2. Does the shipping company provide qualified and licensed crew members to meet all safety operation requirements on board?
	3. Does the shipping company ensure that crew members can effectively communicate while fulfilling their responsibilities under the safety management system?
	4. Has the shipping company established procedures, plans, or instructions for the operation of mechanical and electrical equipment?
	5. Does the shipping company classify mechanical and electrical equipment failures as emergency situations, label them accordingly, and establish emergency response procedures (such as for main engines, loss of power on board, emergency steering gear operation, and drills)?
	6. Has the shipping company developed a maintenance and servicing plan for mechanical and electrical equipment, and is it implemented according to the plan?
1. **Other Issues That May Cause Marine Mechanical and Electrical Equipment Failures**

In addition to the inspection of mechanical and electrical equipment itself, attention should also be paid to the possibility of other systems causing problems with marine mechanical and electrical equipment. For example, the misoperation of the fuel quick-closing valve may cause an unexpected cut-off of the main/auxiliary engine fuel supply, the lack of mechanical and electrical equipment protection facilities may injure crew members causing manual emergency stops, the failure of the bilge water system may cause flooding in the engine room, etc. Crew fatigue issues on board and vessels that have just left the yard after maintenance should also be given extra attention.

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