Chapter 10 Maintenance of Ships and Equipment

1.0 Purpose

TDI-Brooks ensures that all vessels, machinery, and equipment within the organization are maintained in accordance with all relevant rules and regulations of the classification society, flag state, TDIs' guidelines and manufacture's recommendations. This is accomplished by using a planned maintenance program for all vessel equipment.

2.0 Definitions

a) Critical System or Equipment
The company views critical systems and equipment as the equipment or technical systems which is in continuous use and may result in a hazardous situation should it suddenly fail.

b) Standby Critical System or Equipment
The company views standby critical systems and equipment as the equipment or technical systems which are in not in continuous use but must be in readiness at all times. Should a standby critical systems or equipment fail, it may result in a hazardous situation.

c) Hazardous Situation
The company views a hazardous situation as that which could endanger the integrity of the vessel, the safety of the crew, or the environment. These can lead to serious consequences, such as the loss of the ship, the loss of life, or a major environmental spill.

3.0 General

The ISM code calls for the identification of equipment and technical systems that are considered critical. The Company does not take this responsibility lightly. The critical equipment and systems identified are those the Company believes meets the criteria of the ISM code, and more importantly, further ensure the safety of life at sea.

This ISM code also calls for procedures to ensure these systems are adequately maintained and to ensure the reliability of such equipment or systems.

To meet these requirements, each vessel shall have its own Standard Operating Procedure (SOP) that specifically lists the critical and standby critical equipment and the recommended spares for that equipment. All equipment maintenance is recorded and tracked in the planned maintenance system.

4.0 Critical Equipment

Critical Equipment is defined as equipment and technical systems which are in continuous use, the sudden failure of which may result in hazardous situations. Critical Equipment or Systems should include, in the following order:

- Ship's hull including internal tank bulkheads.
- Electrical generation plant including the main switchboard panel and components.
- Main engines including gear box and clutches.
- Steering Gear.
- Specific systems unique to each vessel, such the CPP system on the Gyre.

5.0 Standby Critical Equipment

Standby Critical Equipment is defined as equipment and technical systems which are not in continuous use but must be in readiness at all times. The sudden failure of standby critical equipment may result in hazardous situations, particularly if a continuous use critical system has already failed. Standby Critical Equipment or Systems should include:

- Air Compressors.
- Emergency or standby electrical generator.
- Lifesaving appliances and equipment including the rescue boat davit.
- Firefighting apparatus including fire pumps.
- Fire detection and alarm system.
- Communications systems.
- Navigational equipment.
- Bilge system.
- Ship Security Alert System

- Ship Security Surveillance and Warning System
- Anchor windlass.
- Bow thruster.

6.0 Responsibility

The Captain is responsible for ensuring that the vessel equipment and technical systems are inspected and maintained. The Captain is also responsible for ensuring that the planned maintenance system is kept up to date with the latest maintenance issues, both scheduled and unplanned, e.g., equipment failure, replacement and repairs, etc.

The Chief Engineer is responsible for ensuring that all inspections, tests and maintenance are conducted according to manufacturer guidelines, best practices, and in compliance with the SMM. The Chief Engineer is also responsible for reviewing the planned maintenance system regularly to ensure that all maintenance is correctly entered, and the work orders closed in a timely manner.

The Port Engineer is responsible for reviewing the planned maintenance system frequently to assure that the vessels are entering all maintenance correctly and closing work orders in a timely manner. In the absence of a bridge crew, such as at the dock in stand-by mode in or in a shipyard, the Port Engineer will be responsible for documenting all maintenance in the system.

7.0 Reporting

The maintenance and quality system Administrator will work with the Port Engineer, Captains and other personnel to setup the inspection and maintenance tasks. All maintenance issues, with the possible exception of daily jobs, are to be recorded in the planned maintenance system.

Non-routine maintenance which requires the purchase of new critical equipment or components, scheduling of contractors or shipyard work, must be reported immediately to the **PortEngineer@tdi-bi.com**.

A work order must be created in system and linked to the equipment in order to become part of the maintenance history. The work order must remain open until the equipment is fully repaired or the issue is deemed closed by the Port Engineer. It is the responsibility of the Chief Engineer to ensure the email is sent and the work order created.

8.0 Maintenance Program

TDI Brooks has adopted a planned maintenance system to schedule and track both preventative and unplanned maintenance. This system directly links the office with the vessels regularly to ensure that current information is available to all concerned parties.

Preventative maintenance is scheduled regularly to prevent failures and minimize reactive maintenance. The system tracks preventative maintenance through scheduled standard jobs or tasks which are automatically linked to the associated equipment.

Unplanned maintenance occurs when something breaks and requires repair. It must be entered as a new work order and manually linked to the associated equipment in order to become part of the maintenance history.

The **Quarterly Maintenance Inspection** is a standard job across the fleet consisting of a series of inspection checklists to ensure the vessels are maintained to the required class, Load Line and USCG requirements. This inspection is designed to review several departments in detail to ensure the vessel is properly and consistently maintained. Work orders are created as needed for repairs and are to remain open until the repair is complete.

9.0 Standard Jobs

A standard job is a recurring procedure that is required to maintain the vessel in good operating condition. Standard jobs are identified by equipment manuals, codes and regulations, best practices, vessel crew, office personnel, and a variety of other sources.

Any requests for the addition of a standard job will be directed in writing to the System Administrator who will then create the job into the system following approval from the **Port Engineer and/ or Port Captain**. The standard job list varies by vessel based on equipment aboard.