



## Subject Area no. 14: Maintenance

**Principle:** The company has a programme to inspect and maintain plant and assets to prevent injury to people, damage to the environment and achieve effective performance.

Level	Expectations	Targets	Suggested objective evidence
Basic	<p>Every vessel in the fleet is covered by a planned maintenance system.</p> <p>The company monitors the effectiveness of planned maintenance across the fleet.</p> <p>The company has a process for requesting and authorising maintenance deferrals.</p> <p>The company has a process in place for reporting equipment malfunctions, maintenance and inventory of spare parts.</p>	<p>There is a comprehensive database of machinery equipment and fittings, and the company has established maintenance and inspection/testing intervals. The company monitors outstanding planned maintenance tasks.</p> <p>Formal authorisation of postponement is given by designated staff ashore.</p> <p>There is a process for reporting technical deficiencies, with its possible cause, if known, and that appropriate corrective action is taken.</p>	<p>Planned maintenance system.</p> <p>Inventory of spares.</p> <p>Maintenance procedures.</p> <p>Records of inspection and maintenance.</p>



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Intermediate	The company has a process for monitoring unscheduled maintenance task and defects. Superintendents check maintenance standards and records during ship visits and inspections.	Recurring defects are identified, and appropriate corrective actions taken.  Superintendents carry out regular vessel visits to confirm condition and compliance with the company's maintenance and inspection standards, including machinery plant, lifesaving appliances, firefighting equipment, cargo gear, mooring and anchoring equipment, etc.	Identification of recurring defects.  Superintendents' visit and inspection reports



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Advanced	<p>The company's maintenance and defect reporting systems is fully computerised.</p> <p>The company has developed performance indicators to measure fleet reliability.</p> <p>The company analyses the root causes of major defects.</p>	<p>There is a computerised system that prompts when inspection or maintenance is due or overdue.</p> <p>KPIs may include number of conditions of class, number of failures of critical equipment and systems, off hire time due to technical breakdown, percentage of overdue maintenance, ratio of planned to unplanned maintenance, etc.</p> <p>The root causes of major defects are analysed, and preventive actions are implemented</p>	<p>Review of maintenance and defect reporting records.</p> <p>Technical performance indicators.</p> <p>Root cause of defects</p> <p>Preventative actions are implemented</p>



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Excellence	<p>Engineering assessments are carried while on passage.</p> <p>Condition based monitoring is carried out to ensure equipment reliability.</p> <p>The PMS is integrated with the spare parts inventory and procurement systems.</p>	<p>The company carries out assessments to review engineering practices, skill levels of onboard engineering team, effective teamwork, identify additional training needs, etc.</p> <p>Condition-based monitoring techniques include, for example, vibration analysis of rotating equipment, infrared detection of high temperatures, ultrasonic readings to detect corrosion, oil analysis to determine asset wear, motor current readings and performance sensors that measure pressure, temperature, flow, etc.</p>	<p>Engineering assessments</p> <p>Instruction to engineers for condition-based monitoring, CBM records, etc.</p>