



Recommendations on Engineering Watch/Duty Period Handover and Inspection Routines

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1. Introduction

The widespread introduction of machinery automation and associated alarm and control systems has significantly changed the nature of operational practices on board vessels. The extensive use of computers, monitoring tools and equipment has increased the volume and accuracy of data to the extent that there is a risk that the responsible officer may become insulated from the actual machinery status and performance.

The current professional development of engineering staff tends to focus on the operation of highly automated vessels and may lack some of the practical elements associated with plant management.

This information paper highlights the importance of regular inspections and routine walk-rounds of machinery spaces with the aim of addressing the perceived lack of appreciation for the need for traditional hands-on working practices.

2. Purpose and scope

The purpose of this paper is to provide clear and specific guidelines for the conduct of effective machinery space inspections and walk-rounds.

This scope of the paper includes the following elements:

- Management processes and values impacting on the Company and vessel technical culture.
- Elements of vessel design and any inherent limitations which may influence engineering practices.
- Proactive versus reactive watchkeeping.
- Engine room resources training.
- How to structure a walk-round.
- Familiarisation with systems and machinery including required actions in the event of system and/or equipment failure and the possible consequences of actions taken.
- Consideration of basic “What if?” scenarios for critical equipment.
- Continual improvement by feedback of experience gained within the engineering department, incorporating knowledge transfer, tutoring and mentoring.

3. Role of shore management

Good engineering practice should ensure that an effective overview of the state of the technical equipment and associated systems and alarms is maintained at all times, as well as continuously ensuring that operation and maintenance is prioritised and optimised.

Fundamental to achieving a good overview is a structured approach to the regular inspection rounds by the engineering watchkeeper. The scope and responsibility for these inspection rounds should be clearly identified by shore management.

As well as ensuring that the inspection rounds actually provide the necessary overview, they should be planned in such a way as to promote situational awareness and a comprehensive appreciation of plant status.

Although it is recognised that many vessel operators and individuals carry out inspection rounds as a matter of routine, it is recommended that operators review the actual practices and set defined standards together with associated reporting and feedback routines.

Shore management, having responsibility for establishing and maintaining technical standards on board, should prepare overall inspection guidelines and procedures based on their established operational and maintenance philosophy.

Resources, both ship and shore-based, should be matched to the anticipated activities. It should be ensured that all relevant manuals are readily available to the crew and shore organisation alike, including for example, service letters containing information on operational and maintenance aspects.

Practical measures, such as arranging the change of watch in relation to routine inspection rounds, should aim to make best use of available time and resources.

Good engineering practice cannot exist in isolation, but is an integral part of good on board management and requires effective interaction between the ship and shore organisation.

Vessel operators should consider the implications of vessel design with regard to encouraging good engineering practice. For example, the ergonomic design should facilitate maintenance and optimise operation.

To promote a culture of continuous improvement, lessons from incidents should result in structured knowledge sharing, both on board the individual vessel and across the fleet and, where appropriate, with industry third parties. The consistent sharing and effective communication of such information will encourage the ongoing development of best practice within the industry.

4. On board practices

The following are amongst issues that should be considered when handing over an engineering watch or duty period.

4.1 Process definition

Responsibility for the watch should be clearly defined and handed over.

Prior to assuming responsibility for an engineering watch or Unmanned Machinery Space (UMS) duty period it is considered good engineering practice to carry out a comprehensive inspection of the machinery spaces and the plant within it. This can be accomplished with a systematic and structured walk-round.

4.2 Scope of Routine Inspections

The scope and extent of the inspection and walk-round will be determined by the operational condition of the vessel.

The scope should include a review of the information relevant to the plant's status and performance. Vessel conditions and current operations must be considered. A list of some examples follows:

- Loaded vs. Ballast.
- Deep sea/manoeuvring/in port.
- Cargo operations/at anchor.
- Bunkering.
- Lay-up/refit.

The procedure may form the basis of a company-wide, or ship-specific, formal handover process in order to encourage proactive inspections, effective communication and the general raising of situational awareness and knowledge sharing. Clear reporting actions and decision making should result from the inspection.

4.3 Purpose of routine inspections

The purpose of the inspection is to ensure that the condition of the machinery spaces and the plant within it are well understood by the responsible officer prior to assuming responsibility for the engineering watch or UMS duty period. This may include:

- Confirmation of the safe, efficient and environmentally sound operation of the machinery spaces and equipment.
- Particular attention to status of critical equipment, systems and alarms.
- Awareness of ambient conditions/weather conditions.
- Confirmation of normal state against established reference points.
- Identification of any abnormal condition or status.

4.4 Frequency of routine inspections

The frequency of inspections should be determined by Company procedures.

As a minimum, inspections should be carried out prior to the responsible officer assuming responsibility for the watch or UMS duty period.

4.5 Format of routine inspections

The format of the inspection process should be such that it:

- Is repeatable and documented.
- Relates to the actual mode of operation.
- Develops equipment and situational awareness.
- Incorporates safety, environmental, and housekeeping elements.
- Encourages cross and inter-departmental awareness.

Where practicable, the inspection/walk-round should include all machinery spaces. Emphasis should be on physical inspection using engineering know-how and senses to gain an understanding of the status of the machinery spaces.

To optimise work load resource and time management, the walk-round should be carried out on a comprehensive, systematic basis taking in all of the machinery spaces, systems and items of machinery in a logical progressive manner.

When inspecting systems and machinery, the responsible officer should be aware of their normal operating characteristics. The limitations of instrumentation, gauges and sensors should be appreciated.

Remote inspections may be acceptable for some locations on board depending upon operational constraints and the provision of adequate instrumentation.

The handover of responsibility should include a face-to-face exchange with the incumbent watchkeeper/duty engineer. Information should be exchanged relating to the recent duty-period and should include details of activities scheduled for the forthcoming watch/duty period.

5. Summary

It is recognised that the use of monitoring tools, equipment and computers has increased the volume and accuracy of data available to engineers to the extent that there is a risk that they may become insulated from the machinery's actual status and performance. The routine inspection/walk-round is designed to re-connect the engineer with the plant, thereby increasing confidence in the plant's health, leading to improved plant reliability. Operators are encouraged to ensure that handover inspection requirements are in place and formalised.

To encourage continuous improvement, a periodic review of the effectiveness of the routine inspections/walk-rounds should be conducted. Trends should be analysed and, where appropriate, targeted training provided.

Recognition of performance anomalies or incidents and reaction to them may be addressed by reference to instruction books and ship specific procedures. These should describe required actions in the event of an unusual event.



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