

No. 57 Maintenance and inspection of electrical equipment on the ship

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(Main switchboard, propulsion switchboard, emergency switchboard and section boards)

Introduction

The electrical switchboards, section boards and their equipment, on board the ship, are generally subjected to structural, climatic or electrical wear. In order to preserve their integrity throughout the ship's life, it seemed necessary to develop recommendations dealing with their maintenance and inspection.

1. General

1.1 The hereunder recommendations should be regarded as a guide for owners (or their representatives), builders and surveyors. It covers factors directly related to the maintenance and inspection of the electrical equipment fitted to the main switchboards, propulsion switchboards, emergency switchboards and section boards.

1.2 This guide does not replace the maintenance planning recommended by the manufacturers but should be taken into account in the ship's maintenance scheme.

1.3 The maintenance and inspection operations should be recorded, identifying the examined equipment, obtained results, and any possible investigations and corrections.

1.4 The complete maintenance and inspection operations should be arranged according to table 1 and be co-ordinated with the periodical surveys of the vessel.

2. Definitions

2.1 Maintenance

A combination of any actions carried out to retain an item in, or restore it to, conditions in which it is able to meet the requirements of the relevant specifications and perform its required functions.

2.2 Inspection

An action comprising careful scrutiny of an item carried out with or without dismantling as required, supplemented by means such as measurement, in order to arrive at a reliable conclusion as to the condition of this item.

3. Qualification of personnel

The maintenance and inspection of installations should be carried out by personnel whose training has included instruction on the various types of installations (e.g. verification of medium voltage systems, dynamic positioning systems and other new electrical systems), relevant rules and regulations and on personnel safety.

Qualified personnel responsible for inspection and maintenance works should be appointed by owners and builders, in accordance with the applicable rules and regulations.

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Table 1 - Maintenance and inspection actions

Actions		Every Year	Every Five Years
1	Electrical switchboards and section boards are to be visually examined to assess the good operation and maintenance.	x	x
2	Electric equipment is to be examined for cleanliness. Where deemed necessary, cleaning of electrical equipment (dust suction, wiping up oil water deposits).	x	x
3	It is to be checked that:		
3.1	Cables or other electric equipment are still in the original position. Any modification should be to the satisfaction of the Society.	x	x
3.2	Cable penetration devices are still in good condition (e.g. with appropriate compound).	x	x
3.3	No evidence of overheating, burning or tracking.	x	x
3.4	Measuring equipment is in order.	x	x
3.5	Mechanical ventilation, if fitted, operates as required.	x	x
3.6	Where a protection device has been replaced, its rating and, where applicable, settings are to be verified.	x	x
4	Contacts and arc screens, if any, of all concerned devices are to be checked and reconditioned or replaced if necessary in accordance with manufacturer's recommendation. Movable parts of the said devices are to be tested.		x
5	Tightening of connections and assemblies which may slacken is to be checked and tightened, if required, according to the manufacturer's recommendations. Thermograph aids may be considered to detect hot spots.		x
6	Where accumulator batteries may be stored, the condition of connections (salt deposits ...), the fastenings, the ventilation and the tray tightness are to be checked.	x	x

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Actions		Every Year	Every Five Years
7	Where fitted, computer based systems (including hardware) are to be examined and tested to confirm their satisfactory condition and operation. Their original functions are to be unchanged.		x
8	An insulation measurement of any circuit in doubt is to be carried out. Any large decrease in values is to be investigated and corrected.	x	
9	All circuits are to be subject to insulation measurements for comparison with the insulation recordings previously established. Corrective actions are to be carried out if the values obtained are under 1kΩ per volt.		x
10	Circuit interlocks, if any, are to be tested.		x
11	Protective devices are to be tested. The electronic protective devices for generators and large consumers are to be tested according to Rec. 49.		x
12	The operation of all emergency sources of power is to be tested, including their automatic devices if any.	x	x
13	All automatic sequences, e.g. for synchronization, connection, load shedding if any are to be tested as far as practicable.	x	x
14	Fastening, securing and tightness of the switchboard's cooling system, if fitted, is to be checked.	x	x

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