



The Examination of Surveyable Machinery Items by Chief Engineers

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1. Introduction

- 1.1 This document describes how items of machinery may be credited for survey based on examinations by the ship's Chief Engineer.
- 1.2 The arrangement is only applicable to ships operating on a continuous survey machinery (CSM) cycle and the procedures to be applied depend on whether or not the ship is operating an approved planned maintenance scheme for machinery.
- 1.3 The arrangements described in this document do not apply to the ship Operator's superintendents.

2. Ships operating an approved Machinery Planned Maintenance Scheme (MPMS)

- 2.1 Chief Engineers on ships assigned the ShipRight descriptive note **MPMS** may carry out examinations of selected machinery items to an approved schedule over a five year period corresponding to the existing classification cycles.
- 2.2 An annual audit of the machinery planned maintenance scheme is required, at which the Surveyor will review the records of examination by the Chief Engineer and undertake confirmatory surveys on those items to be credited that have been examined by the Chief Engineer since the previous Audit.
- 2.3 The requirements of the relevant ShipRight Procedures and the conditions listed on the *Certificate of Operation of an approved Machinery Planned Maintenance Scheme* are applicable.

3. Ships not operating an approved Machinery Planned Maintenance Scheme

- 3.1 Under this arrangement, selected items of machinery may be examined by the Chief Engineer while the ship is at sea or in a port where the Lloyd's Register Group is not represented.

It is to be understood that the Operator will carry out as much of the machinery surveys as practicable at ports where the Lloyd's Register Group is represented.

After examination by the Chief Engineer it is the responsibility of the ship Operator to arrange for the attendance of a Surveyor to credit such items. This is to be at the first port where Lloyd's Register's Group's exclusive Surveyors are available.

- 3.2 A list of applicable machinery items is given in section 4 of this document
- 3.3 The Chief Engineer is to prepare two signed copies of a statement giving their name and licence details, the item(s) examined, the condition as found and any repairs effected. A template for this statement is attached as an Appendix to this document and is also available to download from ClassDirect Live. One copy of the statement is to be retained on the ship and the other is to be given to the Surveyor.
- 3.4 A confirmatory survey will be carried out by the Surveyor, at which a review of the records of examination by the Chief Engineer and a general examination of those items to be credited will be carried out.

Following the Chief Engineer's survey of auxiliary engines, the confirmatory survey carried out by the Surveyors is to include the following:

- (a). The engine is to be examined running under load and the governor and circuit breaker tested.
- (b). All safety devices, remote controls, and automatic alarms to be tested.

3.5 Parts that have been replaced by spares are to be retained and shown to the Surveyor.

3.6 With regard to stand-by units, for example auxiliary engines and main lubricating oil pumps, it will be the responsibility of the Chief Engineer, in consultation with the Master in their joint capacity as representatives of the Operator, to ensure that such items are only opened up for examination under favourable conditions so that no hazard, including fire, to the ship or cargo would result from breakdown of a working unit.

The number of auxiliary generator sets must be such that all services essential to the propulsion and safety of the ship, together with preservation of the cargo, can be supplied when any two of the sets are not working. One of these two sets could then be overhauled while the other remains available as the stand-by set.

- 3.7 Items such as auxiliary engines, independently driven pumps and compressors are to be examined under working conditions by the Surveyor who, if not satisfied, may require any item to be opened out for inspection.
- 3.8 The Operator is to instruct Chief Engineers that the survey of auxiliary engines is to proceed as indicated below:
- (a). The engine is to be completely opened up and a careful examination made of all cylinders, liners, covers, valves, valve gear, pistons, piston rings, top and bottom end bearings, gudgeon pins, crankcase door fastenings and explosion relief devices.
 - (b). The top halves of all main bearings are to be removed and at least two bottom halves turned out for inspection. If these are found in good condition the remaining bottom halves need not be removed.
 - (c). A very careful examination is to be made of all crankpins and journals for cracks especially at the fillets and in the vicinity of oil holes.
 - (d). The crankweb deflections are to be measured and recorded. Care must be taken to ensure that the journals are resting on the main bearings when the readings are taken.
 - (e). The cylinder liners are to be gauged and the wear recorded.
 - (f). The lubricating oil cooler is to be opened, examined and tested.
 - (g). Any direct driven lubricating oil pumps, cooling pumps, air compressors, etc., are to be opened up and examined.
 - (h). It is to be verified that all safety devices are in efficient working condition.
- 3.9 Any damage, defect or breakdown which could invalidate the conditions for which class has been assigned, are to be reported to a Lloyd's Register Group office without delay.
- 3.10 Any machinery item which is subject to a condition of class is excluded from this arrangement and is to be dealt with by the Surveyor.

4. Applicable Machinery Items

4.1 Items of machinery which may be examined by the Chief Engineer are given below:

- (a). **Main Propulsion Diesel Engines:**
- Cylinder covers.
 - Valves and valve gears.
 - Cylinder liners.
 - Pistons and piston rods.
 - Connecting rods, crossheads, top end bearings, guides, gudgeon pins and bushes.
 - Fuel injection pumps and fuel booster pumps.
 - Scavenge pumps, blowers and air coolers.
 - Turbocharger.
 - Detuners, dampers and balancer units.
 - Camshaft and camshaft drive.
 - Main engine thrust bearing.
 - Governor.
- (b). **Auxiliary Diesel Engines:**
- Complete unit including coolers and pumps (See section 3 above).
- (c). **Auxiliary Steam Turbines:**
- Complete unit including coolers and pumps (See section 3 above).
- (d). **Auxiliary Machinery:**
- Main engine driven pumps e.g. bilge, lubricating oil and cooling water.
 - Independently driven pumps (and associated motors and cables where insulation resistance readings are supplied), e.g. bilge, ballast, fresh water cooling, sea-water cooling, lubricating oil and oil fuel transfer.
 - Main engine fresh water and lubricating oil coolers.
 - Low pressure heaters used in high viscosity fuel systems of internal combustion engines.
 - Main and auxiliary condensers/drain coolers
 - Air compressors and their safety devices.
 - Forced or induced draught fans.
- (e). **Steering Machinery:**
- Steering gear pumps.
- (f). **Shafting:**
- Intermediate shafts.
- (g). **Pressure Plant:**
- Adjustment of exhaust gas boiler safety valves under steam.
- (h). **Deck Machinery:**
- Windlass and windlass machinery.
- (i). **Refrigerated Cargo Installations:**
- Reciprocating refrigerant compressors.
 - Brine pumps.
 - Condenser cooling pumps.
 - Liquid refrigerant circulating pumps.
- (j). **Ships for Liquefied Gases:**
- Reciprocating refrigerant compressors.
 - Reciprocating cargo gas compressors.
 - Condenser cooling pumps.
 - Circulating pumps (where fitted).
- (k). **Ships fitted with Approved Inert Gas Systems:**
- Scrubber units.
 - Blowers.
 - Independent gas generators.

5. Inapplicable machinery items

5.1 Items of machinery which are not to be examined by the Chief Engineer are given below:

(a). **Main Propulsion Diesel Engines:**

- Crankshaft and bearings.
- Crankcase doors, crankcase and scavenge relief devices.
- Engine trial.
- First start arrangement trial.

(b). **Main steam turbines:**

- Complete unit.

(c). **Gas turbines:**

- Complete unit.

(d). **Reduction gearing:**

- Reduction/increase gearing, flexible couplings and clutches.

(e). **Shafting:**

- Screwshafts.
- Stern bearings

(f). **Propellers:**

- Complete unit.

(g). **Auxiliary machinery:**

- Pumping arrangements.
- Sea connections.

(h). **Pressure plant:**

- Boilers and other pressure vessels.
- Boiler fuel oil heaters.
- Steam pipes.
- Manoeuvring valves and bulkhead stop valves.
- Starting air pipes.

(i). **Electrical equipment:**

- Electrical equipment other than auxiliary motors.

(j). **Control equipment:**

- Main engine controls and controls associated with Class Notations, e.g. UMS, CCS, ICC, IP and DP.

(k). **Steering machinery:**

- Surveyable items other than the steering gear pump.

(l). **Ships fitted with Approved Inert Gas Systems:**

- Remaining components not listed in 4.1.(k).

(m). **General items:**

- Holding down bolts and chocks.
- Machinery damage, repairs and alterations.

6. Appendix

The appendix contains the template to be used by Chief Engineers to record the results of their examination of machinery items on ships not operating an approved Machinery Planned Maintenance Scheme.

Chief Engineer's Statement of Examination of Surveyable Machinery Items

This form is to be used to record the results of the examination of machinery by the ship's Chief Engineer on ships which are not operating an approved Machinery Planned Maintenance Scheme.

Two signed copies of this statement are to be prepared. One copy of the statement is to be retained on the ship and the other is to be presented to the Surveyor. A confirmatory survey will be carried out by the Surveyor, at which a review of the records of examination by the Chief Engineer and a general examination of those items to be credited will be carried out.

Refer to the Lloyd's Register document *The Examination of Surveyable Machinery Items by Chief Engineers* for further instructions on this arrangement and for a list of applicable machinery items.

General details	
Ship Name:	IMO No:
Name of Ship Operator:	Total number of items seen:

Chief Engineer details	
Name of Chief Engineer:	
Chief Engineer's Licence Number:	Chief Engineer's Licence Date of Expiry:
Name of Administration issuing Licence:	

Signature
Date:
Signature of Chief Engineer (named above):

Notes

- 1 This statement is to be presented to the Surveyors at the time of confirmatory surveys.
- 2 The results of examination of machinery items by Chief Engineers are to be recorded on the following page.
- 3 After examination by the Chief Engineer it is the responsibility of the ship Operator to arrange for the attendance of a Surveyor to credit such items. This is to be at the first port where the Lloyd's Register Group's exclusive Surveyors are available.

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Results of Examination			
1. Enter the date of examination, the Lloyd's Register machinery Master List Number and corresponding Description as shown of the Lloyd's Register Master List of Surveyable Items.			
2. Enter details for each Master List item examined in a separate section. Use additional copies of this page, as necessary, to record the results of the examination of multiple items of machinery. Attach each page to the front page signed by the Chief Engineer.			
Details of Item Examined			
Date of Examination			
Master List Number		Description	
Condition, as found.			
Repair, if any.			
Details of Item Examined			
Date of Examination			
Master List Number		Description	
Condition, as found.			
Repair, if any.			
Details of Item Examined			
Date of Examination			
Master List Number		Description	
Condition, as found.			
Repair, if any.			