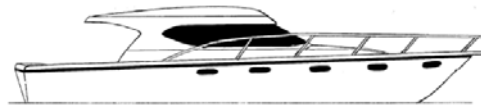


MARINE DESIGN & SURVEY

22 Odegaard Drive
Rosebery
PO Box 1896,
Darwin NT 0801
AUSTRALIA

ABN 98 854 904 473



Ph: 08 8932 2433
E-mail: admin@mdsnt.com.au

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LIGHTSHIP CHECK SPECIFICATION

1. INTRODUCTION

This document specifies the requirements for carrying out a lightship check and for the reporting the results. The object of a lightship check is to obtain the ship's lightship displacement and the longitudinal position (LCG) of its centre of gravity. These lightship characteristics together with the vertical position (VCG) of the ship's centre of gravity (obtained from an inclining experiment or estimate through calculation) are the basis of every loading condition calculated for the ship. Where the stability data is to be approved by an authority, the lightship check may need to be witnessed by a surveyor of that authority.

2. GENERAL

All readings and measurements taken and all information obtained during the lightship check are to be recorded in the report in the units in which they were measured. Where the required standard of accuracy is not achieved the report will not be accepted and the lightship check is to be repeated or an inclining experiment is to be performed.

3. PRELIMINARY PLANING FOR THE LIGHTSHIP CHECK

3.1 **DATE OF LIGHTSHIP CHECK**

The date of the lightship check is to be set at a time when the ship will be complete (or close to completion) and as close to the lightship condition as is practicable.

3.2 **LIGHTSHIP CONDITION**

The ship is in the lightship condition when it is complete with all its equipment and outfit including permanent ballast (solid and liquid) if any, spare parts, water in boilers to normal working level, machinery in working condition and lubricating oil in all machinery, but not in storage tanks or drums. The lightship condition excludes any items of consumable or variable load, such as liquids in tanks or drums, cargo, consumable stores, passengers, crew and their effects.

3.3 **VERIFICATION OF DRAUGHT MARKS**

The draught marks are to be verified for accuracy by the person in charge of the lightship check or, if the stability data is to be approved by an authority, a surveyor of that authority.

3.4 **INFORMATION TO BE AVAILABLE AT LIGHTSHIP CHECK**

The basic information required for the lightship check is to be available on the day of the lightship check and shall include:

- (a) hydrostatic table;
- (b) lines plan;
- (c) tank calibration and free surface information; and
- (d) an up-to-date general arrangement plan.

3.5 CALIBRATED HYDROMETER

The hydrometer used in the lightship check shall be the subject of a current certificate of calibration of a standard acceptable to the Naval Architect and shall have been calibrated not more than:

- (a) two years before the date of the lightship check in the case of an hydrometer made of metal; and
- (b) five years before the date of the lightship check in the case of an hydrometer made of glass.

3.6 ARRANGEMENTS FOR CHECKING

The ship shall be berthed for the lightship check in a protected position where it will be afloat throughout the check, and not affected by wind, tide and currents, and a boat, suitable for use when reading the draught marks, shall be available during the lightship check.

3.7 LIQUIDS ON BOARD

Any liquids on board shall not exceed the amounts required to provide necessary services and essential ballasting. Except with prior approval of the Naval Architect, the total mass of liquids on board shall not exceed 25% of the lightship displacement. Liquids on board shall be confined to the minimum number of tanks. If any spaces contain even small quantities of liquid, the lightship check shall not proceed until these spaces have been cleared dry.

4. PREPARATION ON THE DAY OF THE LIGHTSHIP CHECK

4.1 SUPERVISION

The organization of the lightship check shall be such that the person in charge has control over the workforce carrying out the lightship check.

4.2 WEATHER CONDITIONS

The person in charge shall determine that the weather, wind, dock water and tidal conditions are acceptable at the beginning of the lightship check. If the weather conditions become unacceptable during the lightship check, it shall be discontinued.

Note: Unacceptable weather conditions include excessive wind or waves, rain and adverse tidal conditions.

4.3 PRECAUTIONS BEFORE LIGHTSHIP CHECK

The following precautions shall be observed immediately before beginning the lightship check:

- a) All persons not engaged in the lightship check are ashore and any gangway has been taken off;
- b) the person in charge of the lightship check has notified the deck and engineering officers on duty that the lightship check is to begin and that no fluid handling of any kind shall take place throughout the lightship check;
- c) the person in charge of the lightship check has confirmed with the deck and engineering officers on duty that:
 - i) all bilges are dry,
 - ii) all control valves for heeling and trimming tanks and cross-flooding connections have been securely closed, and
 - iii) all pumps not required for essential services have been shut down;
- d) moveable weights, loose gear, shipyard plant and stagings, have, where practicable, been put ashore and those items which must remain on board have been secured against movement;
- e) the ship is plumbed reasonably upright within 0.5 degrees of the vertical;

- f) all persons on board for the lightship check understand their duties and the set positions they must take up while draught and freeboard measurements are being taken. Their masses and positions are to be recorded for inclusion with the "DRY ITEMS OFF" table;
- g) the ship is afloat and that all mooring lines can be slackened off and the ship be easily kept clear of the berth while draughts are read and the freeboards measured;
- h) every part of the ship is to be inspected to sight the items that are to "come off" the ship to obtain the lightship condition. The mass of each item is to be estimated, and the position of the centre of gravity established. This information is to be recorded in the "DRY ITEMS OFF" table;
- i) "Items to be shifted" to their correct lightship positions are to be checked, and their particulars entered in the "ITEMS SHIFTED" table.

5. THE LIGHTSHIP CHECK

5.1 INFORMATION TO BE RECORDED

All fresh water, fuel, lubricating oil, water ballast and cargo tanks, and bilges and drain tanks shall be sounded, and the readings recorded in the "LIQUIDS OFF" table.

5.2 DRAUGHT & WATER DENSITY MEASUREMENT

From the boat, the draught readings (port and starboard) forward, aft and at midships (if the ship is over 70m in length) shall be measured. In the case of a ship 70m or less in length without midship draught marks, freeboard measurements at midships shall be taken on both sides of the ship. At the same time as the draughts are measured, a sample of the dock water shall be taken forward, aft and midships on each side of the ship. The density shall be determined as the arithmetic mean of these 6 densities measured.

5.3 LIQUIDS OFF

Liquid off items including the soundings (or ullages) read for each tank shall be recorded in the "LIQUIDS OFF" table.

5.4 ITEMS ON

All items to be put on board to complete the ship to the lightship condition shall be recorded in the "ITEMS ON" table together with their respective masses and longitudinal positions of their centres of gravity.

5.5 RECORDING OF FIXED BALLAST

Where fixed ballast (liquid or solid) is used, the mass and longitudinal position of the centre of gravity of each item of ballast shall be recorded in the "FIXED BALLAST" table.

6. LIGHTSHIP CHECK REPORT INFORMATION TO BE INCLUDED

A lightship check report containing the following information shall be prepared:

- a) date, time and place of the experiment;
- b) the wind, weather and tide conditions;
- c) the ship's heading and mooring condition;
- d) the dock water density calculated in accordance with Section 5.2 of this specification;
- e) the names and designations of those carrying out the lightship check and the total number of persons on board during the reading of the draughts and measurements of the freeboard;
- f) the following particulars of the ship:
 - i) length between perpendiculars (LBP) nominated for use throughout the stability data;
 - ii) maximum moulded breadth at midships;
 - iii) moulded depth at midships;

- iv) thickness of the keel plate at midships;
 - v) thickness of the deck stringer plate at side at midships;
 - vi) the designed rake of keel used in the calculations;
 - vii) a table listing the longitudinal positions of each forward draught mark relative to midships and for ships with a designed rake of keel, the corresponding height of the draught datum above the baseline;
 - viii) longitudinal positions of each group of after draught marks relative to midships;
 - ix) longitudinal position of the midship draught marks (where fitted) relative to midships;
 - x) longitudinal position of midships relative to the nearest frame or bulkhead;
 - xi) frame spacing (where this is not uniform throughout the ship's length, the details shall be shown on a dimensioned sketch); and
- g) every reading and measurement taken during the lightship check.

7. **ACCURACY**

The order of accuracy of the readings and measurements taken, and information obtained during a lightship check shall be in accordance with the following:

Length to the nearest	0.001m	(i.e. 1mm)
Mass to the nearest	0.01T	(i.e. 10kg)

- Note:**
1. The lightship particulars calculated from the lightship check are the basis of every loading condition calculated for the ship. The accuracy of these lightship particulars is dependent on the care taken in conducting the lightship check.
 2. In determining the lightship displacement and LCG of the ship the accuracy achieved is influenced by such factors as the accuracy of the reading of the draughts which is governed by the accuracy with which the draught marks have been "cut in" and by the dock water conditions when the readings are being taken.