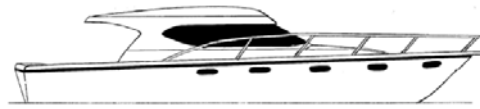


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Doc. No.: **T4435/12**

Date: 22 August 2002

ROLL PERIOD TEST SPECIFICATION

CLASS 3

Measured Length less than 15.0m

1. INTRODUCTION

This specification covers the requirements for carrying out a roll-period test on a USL Code class 3 (fishing) ship of less than 15.0m in measured length. This test can not be used on USL Code class 3 ships that engage in operations resulting in excessive weights on decks or rigging (e.g. tuna fishing, prawn trawling, beam trawling, single or double boom trawling, large fish tanks on deck etc.).

The object of a roll-period test is to determine the ship's metacentric height (GM). The roll-period test must be witnessed by the Principal Naval Architect or his/her nominated representative. Where the stability data is to be approved by a survey authority, the roll period test may have to be witnessed by a surveyor of that authority.

2. STABILITY CRITERIA

The stability of a USL Code class 3 ship less than 15.0m in measured length that does not engage in operations resulting in excessive weights on decks or rigging (e.g. tuna fishing, prawn trawling, beam trawling, single or double boom trawling, large fish tanks on deck etc.), is considered to be satisfactory if the metacentric height (GM) in the "ready for sea" condition is not less than 0.75m, and the angle of deck edge immersion at the point of lowest freeboard is not less than 14°.

3. LIMITATIONS OF USE

This roll-period test specification only applies to ships possessing normal geometric characteristics. For ships with other than normal geometric characteristics and ships of normal geometric characteristics having a G_{fM_o} of less than 0.75m or angle of deck edge immersion of less than 14°, an inclining experiment is to be conducted and the ship's stability is to be assessed using full analysis procedures.

4. PRINCIPAL OF THE ROLL-PERIOD TEST

The roll-period test is used to determine a reasonable approximation of the ship's metacentric height (G_{fM_o}). The G_{fM_o} of the ship is determined by generating a natural rolling of the ship from side to side. The average time for a complete oscillation of a roll is determined. This time and the beam of the ship is entered into a formula that gives a reasonable approximation of the ship's G_{fM_o} .

5. PRELIMINARY PREPARATION FOR THE ROLL PERIOD TEST

5.1 EQUIPMENT REQUIRED

- pencil (with spare leads) θ
- 8m tape measure (check for breakage and that it works) θ

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- sounding tape (check for breakage and that it works) θ
- torch (ensure batteries are charged and that it works) θ
- accurate stop watch (ensure that it works) θ
- this specification and attached Roll-Period Test Report θ

5.2 SHIP LOCATION & MOORING CONDITION

The test is to be conducted with the ship in smooth water with minimal interference from wind and tide. All mooring lines are to be capable of being made slack and any gangway must be removable. There is to be ample water under the ship's keel such that it remains afloat throughout the test.

5.3 "READY FOR SEA" CONDITION

The "ready for sea" condition of loading is generally when the ship is in the full load departure condition with full fuel and water tanks, the nil of cargo, full stores, and crew. The actual "ready for sea" condition will be that determined by the ship's master. Prior to performing the roll-period test, the ship must be examined to ensure that it is in the "ready for sea" condition. To specify this condition-

- (a) determine the contents of each tank on the ship;
- (b) determine the estimated total mass of all stores and their location; and,
- (d) determine that there are sufficient persons on board to represent the ship's normal crew.

The results of this ascertainment are to be entered in the roll-period test result report.

4.4 METHOD OF ROLLING

The ship will be rolled from side to side so that it produces a natural roll. The roll may be induced by pulling on the mast with a rope, or by rhythmically lifting up and putting down a mass as far off the ship's centreline as possible, or by sallying people from side to side in unison. To perform this rolling, a suitable rope, mass (with shore based crane) or group of people must be available.

5. ROLL-PERIOD TEST

After ensuring that the ship is in the worst anticipated condition of loading, it is free to roll naturally with all mooring lines slack and gangway removed, and the ship's motion is not influenced by wind, tidal stream or current, the roll period test is conducted.

5.1 PRECAUTIONS BEFORE TEST

The following precautions are to be observed immediately before beginning the roll-period test:

- (a) all persons not engaged in the roll-period test are to be ashore and the gangway must be taken off;
- (c) the person in charge of the test has confirmed with the owner that-
 - i) all bilges are dry,
 - ii) all control valves for heeling and trimming tanks and cross-flooding connections have been secured close, and
 - iii) all pumps not required for essential services have been shut down;
- (d) movable masses, loose gear, have been secured against movement;
- (e) shipyard plant and stagings, have been put ashore;
- (f) the ship is plumbed reasonably upright;

- (g) all persons on board for the performance of the test understand their duties and the set positions they must take up while rolling measurements are being taken;
- (h) the ship is afloat and that all mooring lines can be slackened off and the ship can be easily kept clear of the berth while roll periods are being timed:

5.1 COMPLETE OSCILLATION

Starting with the ship at the extreme end of a roll to one side, and the ship about to move back towards the upright, one complete oscillation will have been made when the ship has moved right across to the other extreme side and returned to the original starting point and is about to commence the next roll.

5.2 CONTROL OF THE ROLL PERIOD TEST

There must be one person who is in absolute control of the roll period test. This person must have control over the work force carrying out the test.

5.3 PRELIMINARY ROLL PERIOD

It is first necessary to determine the expected natural roll period. This is done by rocking the ship from side to side by any means available. With the stop watch, the time is taken for a known number of complete oscillations (side to side and back again). Divide the time found by the number of complete oscillations. The result is the expected natural roll period.

5.4 MEASURING ROLL PERIOD

- (a) A roll is induced in the ship by pulling on the mast with a rope, or by rhythmically lifting up and putting down by dockside crane a mass as far off the ship's centreline as possible, or (and this is the preferred method) by sallying people from side to side in unison. With whatever method is used, the application of the rolling force should be applied so as to coincide with the expected natural roll period.
- (b) As soon as the induced rolling has commenced, the means by which the roll has been induced must be removed and the ship allowed to roll freely and naturally. Where a mass is used from a dockside crane, the mass must be removed from the ship. Where the roll is induced by sallying people from side to side, those persons should be returned to be as near as is practicable and evenly distributed about the ship's centreline.
- (c) The timing of oscillations must only begin when it is judged that the ship is rolling freely and naturally. By means of a stop watch, the time is to be taken for at least five complete oscillations. The total time and actual number of complete oscillations is to be entered in the Roll-Period Test Report.
- (d) Repeat step 5.4(c) four more times give a total of five sets of results.

6. BEAM MEASUREMENT

The maximum moulded beam of the ship is measured at the mid-length of the measured length. If the ship is made of metal, the moulded beam measurement is taken to the inside of plating. If the ship is made of material other than metal, the moulded beam measurement is made to the outside of the hull form. The moulded beam measurement does not include rubbing strips or sponsons.

7. DECK EDGE IMMERSION ANGLE