Part IV

Performance Standards for Gyro-compasses

25. Function—(1) The gyro-compass shall determine the direction of the ship's head in relation to geographic (true) north.

(2) The equipment shall comply with the following minimum performance requirements.

26. Definitions—For the purpose of this performance standard, the following definitions apply:

(1) The term "gyro-compass" comprises the complete equipment and includes all essential elements of the complete design.

(2) The "true heading" is the horizontal angle between the vertical plane passing through the true meridian and the vertical plane passing through the ship's fore and aft datum line. It is measured from true north (000°) clockwise through 360°.

(3) The compass is said to be "settled" if any three readings taken at intervals of thirty minutes, when the compass is on a level and stationary base, are within a band of 0.7°.

(4) The "settle point heading" is the mean value of ten readings taken at twenty minute intervals after the compass has settled as defined in subclause 3 of this clause.

(5) The "settle point error" is the difference between settle point heading and true heading.

(6) The other errors to which the gyro-compass is subject are taken to be the difference between the observed value and the settle point heading.

27. Method of Presentation—The compass card shall be graduated in equal intervals of one degree or a fraction thereof. A numerical indication shall be provided at least at every ten degrees, starting from 000° clockwise through 360°.

28. Accuracy—(1) Settling of equipment

(a) When switched on in accordance with the manufacturer's instructions the compass shall settle within six hours in latitudes of up to 60°.

(b) The settle point error as defined in clause 26(5) at any heading and at any latitude up to 60° shall not exceed ±0.75 ×secant latitude where heading indications of the compass shall be taken as the mean of 10 readings at 20 minute intervals, and the root mean square value of the differences between individual heading indications and the mean shall be less than 0.25° × secant latitude. The repeatability of settle point error from one run-up to another shall be within 0.25° ×secant latitude.

(2) Performance under operational conditions

(a) When switched on in accordance with the manufacturer's instructions, the compass shall settle within six hours in latitudes of up to 60° when rolling and pitching with simple harmonic motion of any period between six and fifteen seconds, a maximum angle of 5°, and a maximum horizontal acceleration of 0.22m/s².

(b) The repeatability of the settle point error of the master compass shall be within ±1° × secant latitude under the general conditions mentioned in clauses 4 and 5 of this performance standard and including variations in magnetic field likely to be experienced in the ship in which it is installed.

(c) In latitudes of up to 60°:

(i) the residual steady state error, after correction for speed and course influences at a speed of twenty knots, shall not exceed ± 0.25 ×secant latitude;

(ii) the error due to a rapid alteration of speed of twenty knots shall not exceed ±2°;

(iii) the error due to a rapid alteration of course of 180° at a speed of twenty knots shall not exceed ±3°;

(iv) the transient and steady state errors due to the ship rolling, pitching and yawing, with simple harmonic motion of any period between six and fifteen seconds, maximum angle of 20°, 10° and 5°respectively, and maximum horizontal acceleration not exceeding 1m/s², shall not exceed 1° × secant latitude.

(d) The maximum divergence in reading between the master compass and repeaters under all operational conditions shall not exceed ±0.5°.

(3) To ensure that the maximum error referred to in subclause (2)(c)(iv) of this clause is not exceeded in practice, it will be necessary to pay particular attention to the siting of the master compass.

29. Construction and Installation—(1) The master compass and any repeaters used for taking visual bearings shall be installed in a ship with their fore and aft datum lines parallel to the ship's fore and aft datum line to within ±0.5°. The lubber line shall be in the same vertical plane as the centre of the card of the compass and shall be aligned accurately in the fore and aft direction.

(2) Means shall be provided for correcting the errors induced by speed and latitude.

(3) An automatic alarm shall be provided to indicate a major fault in the compass system.

4) The system shall be designed to enable heading information to be provided to other navigational aids such as radar, radio direction-finder and automatic pilot.

Part V

Performance Standards for Newer Radar Equipment

30. Application—These Performance Standards apply to all ships' radar equipment installed on or after 1 September 1984.

31. General—The radar equipment shall provide an indication, in relation to the ship, of the position of other surface craft and obstructions and of buoys, shorelines and navigational marks in a manner which will assist in navigation and in avoiding collision.

32. All Radar Installations—All radar installations shall comply with the minimum requirements in the following clauses.

33. Range performance—The operational requirement under normal propagation conditions, when the radar antenna is mounted at a height of 15 metres above sea level, is that the equipment shall in the absence of clutter give a clear indication of:

(1) Coastlines

(a) At 20 nautical miles when the ground rises to 60 metres

(b) At 7 nautical mines when the ground rises to 6 metres.

(2) Surface objects

(a) At 7 nautical miles a ship of 5,000 tons gross tonnage, whatever her aspect.

(b) At 3 nautical miles a small vessel of 10 metres in length.

(c) At 2 nautical miles an object such as a navigational buoy having an effective echoing area of approximately 10 square metres.

34. Minimum Range— The surface objects specified in clause 33(2) of this performance standard shall be clearly displayed from a minimum range of 50 metres up to a range of one nautical mile, without changing the setting of controls other than the range selector.

35. Display—(1) The equipment shall without external magnification provide a relative plan display in the head-up unstabilised mode with an effective diameter of not less than:

(a) 180 millimetres on ships of 500 gross tonnage and more but less than 1,600 gross tonnage;