

**35. Steam boilers and boiler feed systems**—(1) Every steam boiler and every unfired steam generator shall be provided with not less than two safety valves of adequate capacity. However, having regard to the output or any other features of any boiler or unfired steam generator, the Chief Surveyor may permit only one safety valve to be fitted if the Chief Surveyor is satisfied that adequate protection against overpressure is thereby provided.

(2) Each oil-fired boiler which is intended to operate without manual supervision shall have safety arrangements which shut off the fuel supply and give an alarm in the case of low water level, air supply failure or flame failure.

(3) Water tube boilers serving turbine propulsion machinery shall be fitted with a high-water-level alarm.

(4) Every steam generating system which provides services essential for the safety of the ship, or which could be rendered dangerous by the failure of its feedwater supply, shall be provided with not less than two separate feedwater systems from and including the feed pumps, noting that a single penetration of the steam drum is acceptable. Unless overpressure is prevented by the pump characteristics means shall be provided which will prevent over-pressure in any part of the systems.

(5) Boilers shall be provided with means to supervise and control the quality of the feedwater. Suitable arrangements shall be provided to preclude, as far as practicable, the entry of oil or other contaminants which may adversely affect the boiler.

(6) Every boiler essential for the safety of the ship and designed to contain water at a specified level shall be provided with at least two means for indicating its water level, at least one of which shall be a direct reading gauge glass.

**36. Steam Pipe Systems**—(1) In every ship every steam pipe and every fitting connected thereto through which steam may pass shall be so designed and constructed as to withstand the maximum working stresses to which it may be subjected, with a factor of safety which is adequate having regard to:

- (a) the material of which it is constructed, and
- (b) the working conditions under which it will be used.

(2) Without prejudice to the generality of the foregoing, every steam pipe or fitting shall, before being put into service for the first time, be subjected to a test by hydraulic pressure to a pressure suitably in excess of the working pressure to be determined having regard to the requirements of (a) and (b) of the preceding sub-clause and every such steam pipe or fitting shall be maintained in an efficient condition.

(3) Steam pipes shall be adequately supported.

(4) Provision shall be made which will avoid excessive stress likely to lead to the failure of any such steam pipe or fitting, whether by reason of variation in temperature, vibration or otherwise.

(5) Efficient means shall be provided for draining every such steam pipe so as to ensure that the interior of the pipe is kept free of water and that water hammer action will not occur under any condition likely to arise in the course of the intended service of the ship.

(6) If a steam pipe may receive steam from any source at a higher pressure than it can otherwise withstand with an adequate factor of safety, an efficient reducing valve, relief valve and pressure gauge shall be fitted to such pipe.

**37. Air Pressure systems**—(1) In every ship in which machinery essential for the propulsion and safety of the ship or of persons on board is required to be started, operated or controlled solely by compressed air, there shall be provided an efficient air system which shall include a sufficient number of air compressors and compressed air storage vessels to ensure that an adequate supply of compressed air is available under all conditions likely to be met in service.

(2) (a) The parts of each compressed air system which are subjected to air pressure shall be designed and constructed to withstand, with an adequate factor of safety, the maximum working stresses to which they may be subjected, and every air pressure pipe or fitting in such system, other than a pneumatic control system, shall, before being put into service for the first time, be subject to a hydraulic test suitably in excess of the maximum working pressure to which it may be subjected and be maintained in an efficient condition.

(b) Means shall be provided to prevent overpressure in any part of any such compressed air system and, where water jackets or casings of air compressors and coolers might otherwise be subjected to dangerous overpressure due to leakage into them from air pressure parts, suitable pressure relief arrangements shall be provided.

(c) Provision shall be made to reduce to a minimum entry of oil into any such compressed air system and to drain the system. Provision shall also be made to protect the system from the effects of internal explosion.

(d) All discharge pipes from starting air compressors shall lead directly to the starting air receivers, and all starting air pipes from the air receivers to main or auxiliary engines shall be entirely separate from the compressor discharge pipe system.

**38. Cooling Water Systems**—In every ship in which cooling water services are essential for the running of the propelling machinery there shall be at least two means of operating such water services.

**39. Oil and Fuel Installations**—(1) Any oil fuel used in boilers or machinery shall have a flash point of not less than 60°C, except in the case of the following:

(a) In emergency generators oil fuel with a flashpoint of not less than 43°C may be used.

(b) Subject to such additional precautions as the Chief Surveyor may consider necessary and on condition that the ambient temperature of the space in which such oil fuel is stored or used shall not be allowed to rise to within 10°C below the flashpoint of the oil fuel, the Chief Surveyor may permit the general use of oil fuel having a flashpoint of less than 60°C but not less than 43°C.

(c) In cargo ships the use of fuel having a lower flashpoint than otherwise specified in this paragraph, for example crude oil, may be permitted provided that such fuel is not stored in any machinery space and subject to the approval by the Chief Surveyor of the complete installation.

The flashpoint of oils shall be determined by an approved closed cup method.

(2) The arrangements for the storage, distribution and utilisation of the oil fuel shall be such as to ensure the safety of the ship and persons on board and shall at least comply with the following provisions:

(a) As far as practicable, parts of the oil fuel system containing heated oil under pressure exceeding 180kPa shall not be placed in a concealed position such that defects and leakage cannot readily be observed. The machinery spaces in way of such parts of the oil fuel system shall be adequately illuminated.

(b) The ventilation of machinery spaces shall be sufficient under all normal conditions to prevent accumulation of oil vapour.

(c) As far as practicable, oil fuel tanks shall be part of the ship's structure and shall be located outside machinery spaces of category A. Where oil fuel tanks, other than double bottom tanks, are necessarily located adjacent to or within machinery spaces of category A, at least one of their vertical sides shall be contiguous to the machinery space boundaries, and shall preferably have a common boundary with the double bottom tanks, and the area of the tank boundary common with the machinery spaces shall be kept to a minimum. Where such