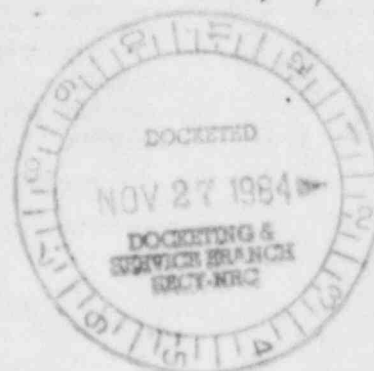


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# Rules and Regulations for the Classification of Ships

## Part 5

### Main and Auxiliary Machinery

#### Chapter 1

#### General Requirements for the Design and Construction of Machinery

#### NUCLEAR REGULATORY COMMISSION

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# General Requirements for the Design and Construction of Machinery

Effective from 29 January, 1983

Part	8
Chapter	1
Section(s)	3 & 4
Page	2

5.2.2 For emergency generator engines, fuel having a flash point of not less than 43°C may be used.

5.2.3 Fuels with flash points lower than 60°C, but not less than 43°C unless specially approved, may be used in ships intended for service restricted to geographical limits where it can be ensured that the temperature of the machinery and boiler spaces will always be 10°C below the flash point of the fuel. In such cases, safety precautions and the arrangements for storage and pumping will be specially considered.

5.2.4 The use of fuel having a lower flash point than specified in 5.2.1 to 5.2.3 as applicable may be permitted provided that such fuel is not stored in any machinery space and the arrangements for the complete installation are specially approved.

5.2.5 For engines operating on 'boil-off' vapours from the cargo, see the Society's *Rules for Ships for Liquefied Gases*.

## 3.3 Power ratings

3.3.1 In the Chapters where the dimensions of any particular component are determined from shaft power,  $P$ , in kW ( $H$ , in shp), and revolutions per minute,  $R$ , the values to be used are to be derived from the following:—

For main propelling machinery, the maximum shaft power and corresponding revolutions per minute giving the maximum torque for which the machinery is to be classed.

For auxiliary machinery, the maximum continuous shaft power and corresponding revolutions per minute which will be used in service.

## 3.4 Definitions

3.4.1 Units and formulae included in the Rules are shown in SI units followed by metric units in brackets, where appropriate.

3.4.2 Where the metric version of shaft power, i.e. (shp), appears in the Rules, 1 shp is equivalent to 75 kgf m/sec or 0,735 kW.

3.4.3 Pressure gauges may be calibrated in bar, where:—  
1 bar = 0,1 N/mm<sup>2</sup> = 1,02 kgf/cm<sup>2</sup>

## 3.5 Ambient reference conditions

3.5.1 The rating for classification purposes of main and essential auxiliary machinery intended for installation in sea-going ships to be classed for unrestricted (geographical) service is to be based on a total barometric pressure of 1000 mbar, an engine room ambient temperature or suction air temperature of 45°C, a relative humidity of 60 per cent and a sea water temperature or, where applicable, the temperature of the charge air coolant at the inlet of 32°C. The engine manufacturer is not expected to provide simulated ambient reference conditions at a test bed.

3.5.2 In the case of ships to be classed for restricted service, the rating is to be suitable for the temperature conditions associated with the geographical limits of the restricted service. See Pt 1, Ch 2

## 3.6 Power conditions for generator sets

3.6.1 Auxiliary engines coupled to electrical generators are to be capable under service conditions of developing continuously the power to drive the generators at full rated output (kW) and, in the case of oil engines and gas turbines, of developing for a short period (15 minutes) an overload power of not less than 10 per cent (see Pt 6, Ch 2).

3.6.2 Enginebuilders are to satisfy the Surveyors by tests on individual engines that the above requirements, as applicable, can be complied with, due account being taken of the difference between the temperatures under test conditions and those referred to in 3.5. Alternatively, where it is not practicable to test the engine/generator set as a unit, type tests (e.g. against a brake) representing a particular size and range of engines may be accepted. With oil engines and gas turbines, any fuel stop fitted is to be set to permit the short period overload power of not less than 10 per cent above full rated output (kW) being developed.

## 3.7 Astern power

3.7.1 Sufficient astern power is to be provided to maintain control of the ship in all normal circumstances.

3.7.2 Astern turbines are to be capable of maintaining in free route astern 70 per cent of the ahead revolutions, corresponding to the maximum propulsion shaft power for which the machinery is to be classed, for a period of at least 30 minutes without undue heating of the ahead turbines and condensers.

• End of Section

## SECTION 4

### Machinery room arrangements

#### 4.1 Accessibility

4.1.1 Accessibility, for attendance and maintenance purposes, is to be provided for machinery plants.

#### 4.2 Machinery fastenings

4.2.1 Bedplates, thrust seatings and other fastenings are to be of robust construction, and the machinery is to be securely fixed to the ship's structure to the satisfaction of the Surveyor.

#### 4.3 Ventilation

4.3.1 All spaces, including engine and cargo pump spaces, where flammable or toxic gases or vapours may accumulate, are to be provided with adequate ventilation under all conditions.

#### 4.4 Fire protection

4.4.1 All surfaces of machinery where the surface temperature may exceed 220°C and where impingement of flammable liquids may occur are to be effectively shielded to prevent ignition. Where insulation covering these surfaces is oil-absorbing or may permit penetration of oil, the insulation is to be encased in steel or equivalent.

#### 4.5 Means of escape

4.5.1 For means of escape from machinery spaces see Pt 3, Ch 3, 4 and Pt 6, Ch 4, 25.