

4. The level of knowledge required under the different paragraphs of the Appendix may be varied according to whether the certificate is being issued at chief engineer officer or second engineer officer level.

#### APPENDIX TO REGULATION III/2

##### Minimum knowledge required for certification of chief engineer officers and second engineer officers of ships powered by main propulsion machinery of 3 000 kW propulsion power or more

1. The syllabus given below is compiled for examination of candidates for certification as chief engineer officer or second engineer officer of ships powered by main propulsion machinery of 3 000 kW propulsion power or more. Bearing in mind that a second engineer officer shall be in a position to assume the responsibilities of a chief engineer officer at any time, examination in these subjects shall be designed to test the candidate's ability to assimilate all available information that affects the safe operation of the ship's machinery.

2. With respect to paragraph 4(a) below, the Administration may omit knowledge requirements for types of propulsion machinery other than those machinery installations for which the certificate to be awarded shall be valid: A certificate awarded on such a basis shall not be valid for any category of machinery installation which has been omitted until the engineer officer proves to be competent in these items to the satisfaction of the Administration. Any such limitation shall be stated in the certificate.

3. Every candidate shall possess theoretical knowledge in the following subjects:

- (a) thermodynamics and heat transmission;
- (b) mechanics and hydromechanics;
- (c) operational principles of ships' power installations (diesel, steam and gas turbine) and refrigeration;
- (d) physical and chemical properties of fuels and lubricants;
- (e) technology of materials;
- (f) chemistry and physics of fire and extinguishing agents;
- (g) marine electrotechnology, electronics and electrical equipment;
- (h) fundamentals of automation, instrumentation and control systems;
- (i) naval architecture and ship construction, including damage control.

4. Every candidate shall possess adequate practical knowledge in at least the following subjects:

- (a) operation and maintenance of:
  - (i) marine diesel engines;
  - (ii) marine steam propulsion plant;