§ 154.435 General.
(a) The design of a semi-membrane tank, the supporting insulation for the tank, and the supporting hull structure for the tank must be specially approved by the Commandant (CG–ENG).
(b) A semi-membrane tank must be designed to meet:
   (1) § 154.425 through § 154.432;
   (2) § 154.437 through § 154.440; or
   (3) § 154.444 through § 154.449.

§ 154.436 Design vapor pressure.
The \( P_o \) of a semi-membrane tank must not exceed 24.5 kPa gauge (3.55 psig) unless special approval by the Commandant (CG–ENG) allows a \( P_o \) between 24.5 kPa gauge (3.55 psig) and 69 kPa gauge (10 psig).

§ 154.437 General.
An independent tank type A must meet § 154.438 through § 154.440.

§ 154.438 Design vapor pressure.
(a) If the surface of an independent tank type A are mostly flat surfaces, the \( P_o \) must not exceed 69 kPa gauge (10 psig).
(b) If the surfaces of an independent tank type A are formed by bodies of revolution, the design calculation of the \( P_o \) must be specially approved by the Commandant (CG–ENG).

§ 154.439 Tank design.
An independent tank type A must meet the deep tank standard of the American Bureau of Shipping published in “Rules for Building and Classing Steel Vessels”, 1981, and must:
(a) Withstand the internal pressure determined under § 154.407;
(b) Withstand loads from tank supports calculated under §§ 154.470 and 154.471; and
(c) Have a corrosion allowance that meets § 154.412.

§ 154.440 Allowable stress.
(a) The allowable stresses for an independent tank type A must:
(1) For tank web frames, stringers, or girders of carbon manganese steel or aluminum alloys, meet \( \sigma_b/2.66 \) or \( \sigma_Y/1.33 \), whichever is less; and
(2) For other materials, be specially approved by the Commandant (CG–ENG).
(b) A greater allowable stress than required in paragraph (a)(1) of this section may be specially approved by the Commandant (CG–ENG) if the equivalent stress (\( \sigma_e \)) is calculated from the formula in appendix A of this part.
(c) Tank plating must meet the American Bureau of Shipping’s deep tank standards, for an internal pressure head that meets § 154.439(a), published in “Rules for Building and Classing Steel Vessels”, 1981.

§ 154.441 General.
An independent tank type B must be designed to meet §§ 154.445 through 154.449.

§ 154.445 Design vapor pressure.
If the surfaces of an independent tank type B are mostly flat surfaces, the \( P_o \) must not exceed 69 kPa gauge (10 psig).

§ 154.446 Tank design.
An independent tank type B must meet the calculations under § 154.448.

§ 154.447 Allowable stress.
(a) An independent tank type B designed from bodies of revolution must