(1) For the step landing case

$$n_w = \frac{C_1 V_{S0^2}}{\left(\text{Tan}^{\frac{2}{3}} \beta\right) W^{\frac{1}{3}}}$$

(2) For the bow and stern landing cases

$$n_w = \frac{C_1 V_{S0^2}}{\left(\text{Tan}^{\frac{2}{3}} \beta\right) W^{\frac{1}{3}}} \times \frac{K_1}{\left(1 + {r_x}^2\right)^{\frac{2}{3}}}$$

(b) The following values are used:

(1) n_W=water reaction load factor (that is, the water reaction divided by seaplane weight).

(2) C_1=empirical seaplane operations factor equal to 0.012 (except that this factor may not be less than that necessary to obtain the minimum value of step load factor of 2.33).

(3) V_{S0}=seaplane stalling speed in knots with flaps extended in the appropriate landing position and with no slipstream effect.

(4) β=angle of dead rise at the longitudinal station at which the load factor is being determined in accordance with figure 1 of appendix B.

(5) W= seaplane design landing weight in pounds.

(6) K_1=empirical hull station weighing factor, in accordance with figure 2 of appendix B.

(7) r_x=ratio of distance, measured parallel to hull reference axis, from the center of gravity of the seaplane to the hull longitudinal station at which the load factor is being computed to the radius of gyration in pitch of the seaplane, the hull reference axis being a straight line, in the plane of symmetry, tangential to the keel at the main step.

(c) For a twin float seaplane, because of the effect of flexibility of the attachment of the floats to the seaplane, the factor K_1 may be reduced at the bow and stern to 0.8 of the value shown in figure 2 of appendix B. This reduction applies only to the design of the carrythrough and seaplane structure.

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§25.529 Hull and main float landing conditions.

(a) *Symmetrical step, bow, and stern landing*. For symmetrical step, bow, and stern landings, the limit water reaction load factors are those computed under §25.527. In addition—

(1) For symmetrical step landings, the resultant water load must be applied at the keel, through the center of gravity, and must be directed perpendicularly to the keel line;

(2) For symmetrical bow landings, the resultant water load must be applied at the keel, one-fifth of the longitudinal distance from the bow to the step, and must be directed perpendicularly to the keel line; and

(3) For symmetrical stern landings, the resultant water load must be applied at the keel, at a point 85 percent of the longitudinal distance from the step to the stern post, and must be directed perpendicularly to the keel line.

(b) *Unsymmetrical landing for hull and single float seaplanes*. Unsymmetrical step, bow, and stern landing conditions must be investigated. In addition—

(1) The loading for each condition consists of an upward component and a side component equal, respectively, to 0.75 and 0.25 tan β times the resultant load in the corresponding symmetrical landing condition; and

(2) The point of application and direction of the upward component of the load is the same as that in the symmetrical condition, and the point of application of the side component is at the same longitudinal station as the upward component but is directed inward perpendicularly to the plane of symmetry at a point midway between the keel and chine lines.

(c) *Unsymmetrical landing; twin float seaplanes*. The unsymmetrical loading consists of an upward load at the step of each float of 0.75 and a side load of 0.25 tan β at one float times the step landing load reached under §25.527. The side load is directed inboard, perpendicularly to the plane of symmetry midway between the keel and chine lines of the float, at the same longitudinal station as the upward load.