(c) When doing the calculations in paragraph (a) of this section, the free surface effect of a liquid in a tank must be determined by—

(1) Assuming the vessel is heeled five degrees from the vertical; or

(2) Calculating the shift of the center of gravity of the liquid in the tank by the moment of transference method.

§ 170.295 Special consideration for free surface of passive roll stabilization tanks.

(a) The virtual increase in the vertical center of gravity due to a liquid in a roll stabilization tank may be calculated in accordance with paragraph (b) of this section if—

(1) The virtual increase in the vertical center of gravity of the vessel is calculated in accordance with § 170.285(a); and

(2) The slack surface in the roll stabilization tank is reduced during vessel motions because of the shape of the tank or the amount of liquid in the tank.

(b) The virtual rise in the vertical center of gravity calculated in accordance with § 170.285(a) for a stabilization tank may be reduced in accordance with the following equation:

E.F.S. = (K)(F.F.S.)

where—

E.F.S. = the effective free surface.

F.F.S. = the full free surface calculated in accordance with § 170.285(a).

K = the reduction factor calculated in accordance with paragraph (c) of this section.

(c) The factor (K) must be calculated as follows:

(1) Plot (I/d)tan T on Graph 170.295 where—

(i) (I) is the moment of inertia of the free surface in the roll tank;

(ii) (d) is the density of the liquid in the roll tank; and

(iii) (T) is the angle of heel.

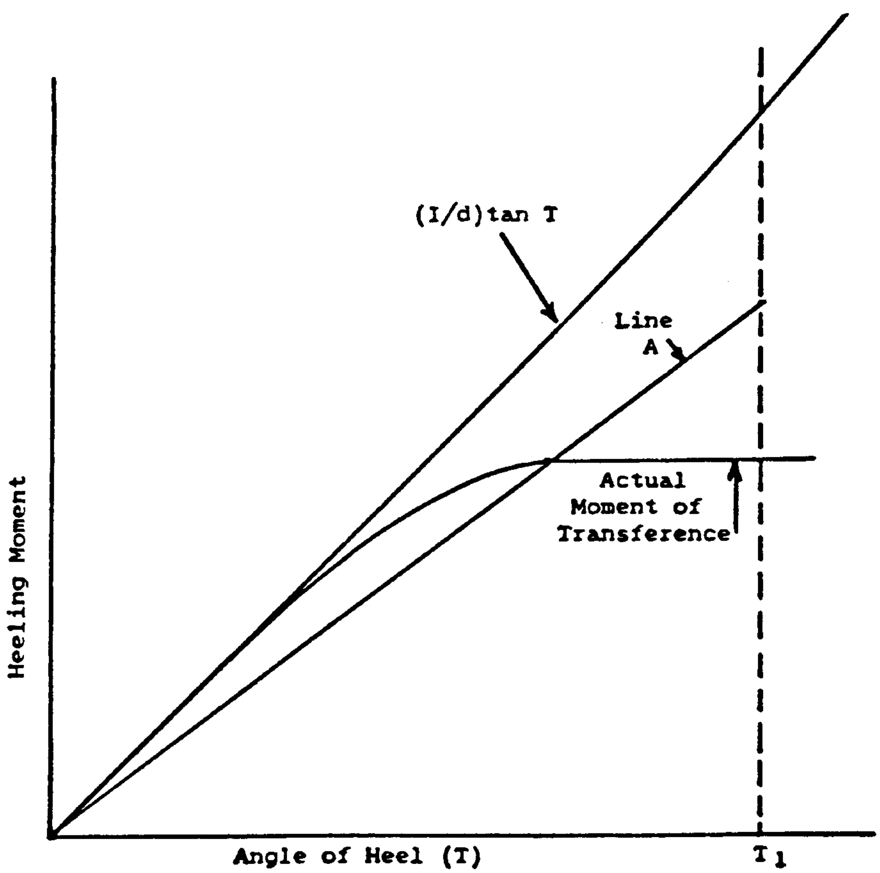
(2) Plot the moments of transference of the liquid in the roll tank on Graph 170.295.

(3) Construct a line A on Graph 170.295 so that the area under line A between T = 0 and the angle at which the deck edge is immersed or 28 degrees, whichever is smaller, is equal to the area under the curve of actual moments of transference between the same angles.

(4) The factor (K) is calculated by determining the ratio of the ordinate of line A to the ordinate of the curve of (I/d)tan T, both measured at the angle at which the deck edge is immersed or 28 degrees, whichever is smaller.

GRAPH 170.295

Special Free Surface Correction
for
Stabilization Tanks



T_1 = the angle at which the deck edge is immersed or 28 degrees, whichever is smaller.