1.3.2 Hydrodynamic pressures for HSM load cases

The hydrodynamic pressures, P_W, for HSM-1 and HSM-2 load cases, at any load point, in kN/m^2, are to be obtained from Table 2. See also Figure 2 and Figure 3.

Table 2 : Hydrodynamic pressures for HSM load cases

	Wave pressure, in kN/m^2		
Load case	$z \le T_{LC}$	$T_{LC} < z \le h_W + T_{LC}$	$z > h_W + T_{LC}$
HSM-1	$P_W = max\ (-P_{HS}, \rho g\ (z - T_{LC}))$	$P_W = P_{W,WL} - \rho g(z - T_{LC})$	$P_W = 0.0$
HSM-2	$P_W = max\ (P_{HS}, \rho g\ (z - T_{LC}))$		

where:

$$P_{HS} = f_\beta\ f_{ps}\ f_{nl}\ f_h\ k_a\ k_p\ f_{yz}\ C_w \sqrt{\frac{L_0 + \lambda - 125}{L}}$$

f_{nl} : Coefficient considering non-linear effects, to be taken as:

- For extreme sea loads design load scenario:

  f_{nl} = 0.7 at f_{xL} = 0

  f_{nl} = 0.9 at f_{xL} = 0.3

  f_{nl} = 0.9 at f_{xL} = 0.7

  f_{nl} = 0.6 at f_{xL} = 1

- For ballast water exchange design load scenario:

  f_{nl} = 0.85 at f_{xL} = 0

  f_{nl} = 0.95 at f_{xL} = 0.3

  f_{nl} = 0.95 at f_{xL} = 0.7

  f_{nl} = 0.80 at f_{xL} = 1

Intermediate values are obtained by linear interpolation.

f_{yz} : Girth distribution coefficient, to be taken as:

$$f_{yz} = \frac{z}{T_{LC}} + f_{yB} + 1$$

f_h : Coefficient to be taken as:

$$f_h = 3{,}0(1{,}21 - 0{,}66\ f_T)$$

k_a : Amplitude coefficient in the longitudinal direction of the ship, to be taken as:

$$k_a = (0{,}5 + f_T)\left\{(3 - 2\sqrt{f_{yB}}) - \frac{20}{9} f_{xL}(7 - 6\sqrt{f_{yB}})\right\} + \frac{2}{3}(1 - f_T) \quad \text{for } f_{xL} < 0{,}15$$

$$k_a = 1{,}0 \quad \text{for } 0{,}15 \le f_{xL} < 0{,}7$$

$$k_a = 1 + (f_{xL} - 0{,}7)\left\{\left(\frac{40}{3} f_T - 5\right) + 2(1 - f_{yB})\left[\frac{18}{C_B} f_T (f_{xL} - 0{,}7) - 0{,}25(2 - f_T)\right]\right\} \quad \text{for } f_{xL} \ge 0{,}7$$