Publication C684

Cost standards for dredging equipment (2009)

Errata

Readers are advised that the calculations on pages 59 to 61 are incorrect. Please see accompanying pages with the correct information.

We apologise for any inconvenience this may have caused.

A2   Example computation

A2.1   Trailing suction hopper dredger

A worked example of computation of depreciation and interest, and maintenance and repair for a trailing suction hopper dredger using the cost standards.

Particulars:

The trailing suction hopper dredger has the following characteristics:

* lightweight (W) of 7000 tonnes

* 4500 kW of power on the dredge pumps (P_t)

* 1600 kW of power to the jet pumps (J_t)

* 12 000 kW of propulsive power when sailing (S).

It is assumed that the indexation for this type of dredger has been established as 1.05 for the year in question.

The dredger will be working 126 service hours that could, for example, represent about 110 operational hours, per week.

The equation for the value of the dredger is given in Table 100 and, without indexation, is:

$$V = 6\ 000 \times W + 1\ 212\ 000 \times W^{0.35} - 6\ 464\ 000 + 1900 \times P_t + 785 \times J_t + 910 \times S$$
$$= €83\ 133\ 192$$

This value has to be increased by the indexation figure of 1.05 to €87 289 852 to obtain the current value. The weekly D+i is then given by taking 0.292 per cent of this figure **= €254 886**

For computing the M+R, the base value should be used and compared with the example table for TSHDs (Table 100). The base value lies between two base value figures in the example table, namely €80 400 000 and €89 800 000. The percentage M+R for these two values are 0.1117 per cent and 0.1088 per cent respectively. The true percentage for €83 133 192 is given by:

$$(83\ 133\ 192 - 80\ 400\ 000)/(89\ 800\ 000 - 80\ 400\ 000) \times (0.1088 - 0.1117) + 0.1117 = 0.1109\ \%$$

Giving a weekly M+R of €92 195 for the base value and an M+R for the current value of 90 948 × 1.05 = €96 804. This does not include M+R for wear and tear of soil conveying components of the dredger.

From § 3.7.2 it is derived that 40 per cent of this figure is fixed and 60 per cent is variable. Using the formula F = 1 + 0.6 × (A – H)/H, this means that the multiplication factor for M+R is 1 + 0.6 × (126 – 168)/168, which in this case is 85 per cent for 126 service hours. Total M+R excluding wear and tear of dredging components is now 85 per cent of €96 804= €82 283.

A2.2   Cutter suction dredger

A worked example of computation of depreciation and interest, and maintenance and repair for a sea-going self-propelled cutter suction dredger using the cost standards.

Particulars:

The cutter suction dredger has the following characteristics:

- power of cutter engines (C) is 2300 kW
- weight of the cutter gearbox (W_{cgb}) is 65 tonnes
- 8000 kW of power (P+J) to the pumps
- a total lightweight (W) of 5000 tonnes
- 3000 kW of propulsive power (S) when sailing.

The dredger is completely diesel-electric and is equipped with a flexible spud carrier.

It is assumed that the indexation for this type of dredger has been established as 1.10 for the year in question.

The dredger will be working a 112 hours gross service time (as an example this could represent about 80 operational hours) per week.

The equation for the value of the dredger is given in Table 200 and, without indexation, is:

V = 2000 × C + 80 000 × W_{cgb} + 1400 × (P + J) + 8500 × W + 141 000 × $W^{0.35}$ + 950 × S

plus 2 % of the equation for the flexible spud carrier

plus 6 % of the equation for the diesel-electric drivers

= €74 659 113

This value has to be increased by the indexation figure of 1.10 to €82 125 024 to obtain the current value. The weekly D+i is then given by taking 0.371 per cent of this figure = €304 684.

For computing the M+R, the base value should be used and compared with the example table for CSDs (Table 200). The base value lies between two base value figures in the example table, namely €71 700 000 and €81 200 000. The percentage M+R for these two values are 0.1259 per cent and 0.1217 per cent respectively. The true percentage for €74 659 113 is given by:

(74 659 113 – 71 700 000)/(81 200 000 – 71 700 000) × (0.1217 – 0.1259) + 0.1259 = 0.1246 %

Giving a weekly M+R of €93 025 for the base value and an M+R for the current value of €93 025 × 1.10 = €102 328.

From § 3.7.2 it is derived that 40 per cent of this figure is fixed and 60 per cent is variable. Using the formula F = 1 + 0.6 × (A – H)/H, this means that the multiplication factor for M+R is 1 + 0.6 × (112 – 168)/168 = 0.80, which in this case is 80 per cent for 112 service hours.

Total M+R excluding wear and tear of dredging components is now 80 per cent of €102 328 = €81 862.