

### Determining the actual operation period when keeping records

The actual duration  $S_i$  for the period of inspection is determined in compliance with FEM 9.755 :

$$S_i = (K_{m1} \cdot T_{o1}),$$

where:

- $I$  is the consecutive number of the inspection;
- $K_{m1}$  is the actual coefficient of the loading conditions during the inspection periods;
- $T_{o1}$  are the working hours during the inspection period.

The theoretical period of operation is reached when:

$$S = \sum_{i=1}^n S_i \leq D,$$

Where  $n$  is the number of inspections performed.

### Calculation of work duration

The time period during which the unit operates is defined as operating duration:

It is determined through the value shown by the counter. The counter counts the time during which the unit has been operating. The measuring unit for time is the hour.

When there is no counter available, the operating duration for the inspection period is calculated as follows:

$$T_{o1} = \frac{2.H.N.T.Dp}{60.V}$$

where:

- $V$  (m/min) – lifting speed;
- $N$  – number of cycles per hour;
- $H$  – the average value of lifting height in meters per cycle. Cycle is meant to denote both lifting and lowering;
- $T$  – working time duration measured in hours per day;
- $Dp$  – working days for the inspection interval.

### Example

Carry out the first inspection check up of the electric hoist( operation duty mode 2m) with the following data:

Lifting speed - 24 m/min;

Number of cycles per hour – 20;

Average lifting height - 11 m;

Working time duration per day – 8 hours.

Number of days for the inspection period - 250 days.

The documentary record as per p. 6.2.3, testifies that the hoist has transported loads as follows :

- 15%** of the time with rated load ;
- 16%** of the time with 3/4 of the rate load;
- 14%** of the time with 1/2 of the rated load;
- 5%** of the time with 1/4 of the rated load;
- 50%** of the time without any load.

According to the recorded data, the operation time for the inspection period is :

$$\frac{2.11.20.8.250}{60.24}$$

$$T_{01} = \frac{2.11.20.8.250}{60.24} = 611.1 \text{ hours}$$

The actual  $Km_1$  coefficient is :

$$Km_1 = 1^3 \cdot 0,15 + 0,75^3 \cdot 0,16 + 0,5^3 \cdot 0,14 + 0,25^3 \cdot 0,05 = 0,2357$$

The actual operation duration for the inspection period is :

$$S_1, = 0,2357 \cdot 611,1 \cdot 1,2 = 172,84 \text{ ,hours}$$

The theoretical operating duration after the inspection period equals:

$$D = 1600 - 172,84 = 1427,16 \text{ ,hours}$$

After all calculations are made, results are entered into the register - Sample 1.

After the theoretical operation duration limit is reached, the hoist is allowed to continue operation only after an overhaul.

When keeping records is done as per p 6.1.2 and p. 6.1.3, the electric hoist should undergo an overhaul no later than 10 years after the date it was put into operation (as per FEM 9.755).