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## **INTEGRATED MAINTENANCE MANAGEMENT SYSTEM OF THE OVERHEAD TRAVELLING CRANES**

### **1. Introduction**

Management of maintenance of transport devices is particularly important at the manufacture where large number of the same class devices is operating. The above problem is observed at the manufacture where overhead travelling cranes are operating. Cranes mostly are operating for a few dozen of years and are representing various-past technical knowledge and experience progressing during the years. The paper's aim is an integrated maintenance management system of the overhead travelling cranes. The optimisation criteria are time and cost.

### **2. Maintenance Management System**

Maintenance management system of overhead cranes includes monitored elements of management structure like: irregularity in the device (1), maintenance range of the device (2), finance - the maintenance expenses (3) - Figure 1.

Rationalisation of maintenance process requires integration of both operation and maintenance phases of the device by use of existing service potential (human and hardware resources, as well as the warehousing of spare parts) and data base arrangement about exploited devices (technical data of device and its units, events accompanying device's exploitation) - Figure2. Systematic data base means information recording enabling its usage.

In module base 1 (Fig.3) it was specified: device's subsystems (KN - supporting structures, MR - movement mechanism), device's units (MP - lifting mechanism, MJM - bridge and truck traversing mechanism) and their units (S - engine, SP - clutch, H - break, R - reducer, EW - operating unit), which were described by exploitation parameters (technical data) and their structure was shown on engineering drawing. On the base of technical data it is possible to build data base 2 concerning elements of exploiting structures (numbers,

addresses), also for the needs of unification the device's units and rationalisation of spare parts control.

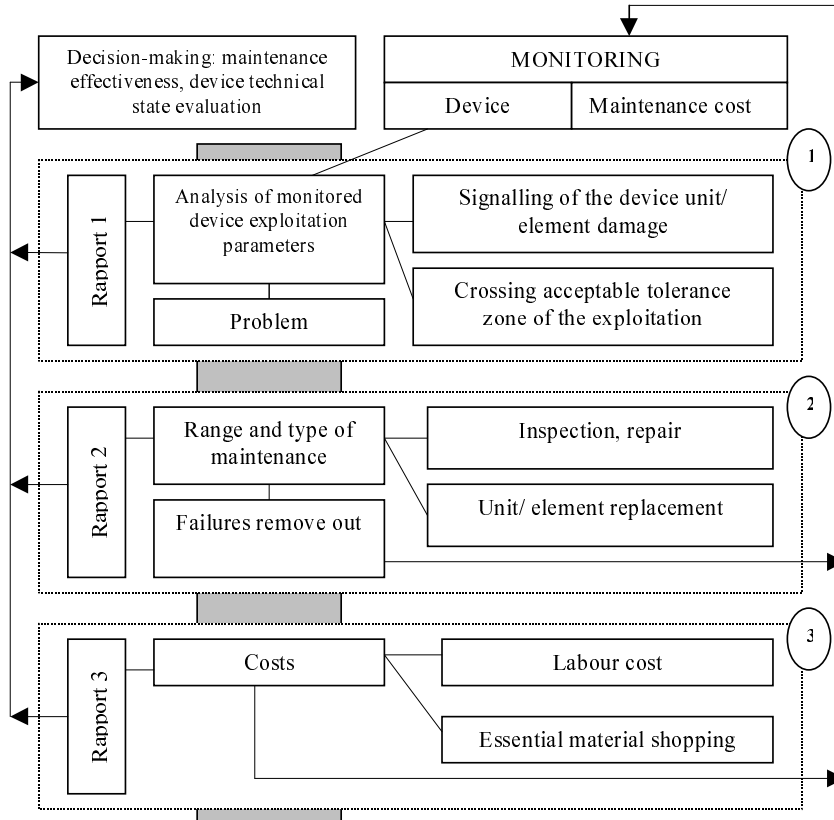


Fig. 1. Maintenance management system of overhead cranes

In module operation on Figure 4 the operating phases of device, loading with useful cargo and the continual evaluation of technical state within operation possibilities is carried on. As a result of above information the diagnosis decision is being made which concerns realisation of maintenance module and time of failure-free operating is being recorded. On this base the devices reliability is determined.

Module maintenance is shown on Figure 5. It comprises sorts of maintenance and the decisions, which are made to restore the devices exploitation state. On that base it is possible to describe qualitative and quantitative maintenance, evaluate the reliability of devices units for needs of rationalisation the warehousing of spare parts and rationalisation the maintenance potential.

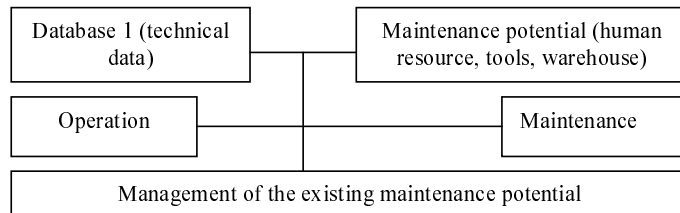


Fig. 2. Management of the existing maintenance potential

<i>Database 1</i>	<b>Device N</b>		Technical data	Drawing
	<b>Device 1</b>			
System	Crane			
Subsystem	KN, MR			
Unit	MP, MJM,			
Element	S, SP, H, R,			

Fig. 3. Module base 1 for needs of exploiting device

<b>Device 1</b>	<b>Device N</b>		
<i>Operation</i>	Work cycle	Usefulness load	Technical state
Crane			
KN, MR			
MP, MJM,			
S, SP, H, R,			

Fig. 4. Operation module for the device exploitation needs

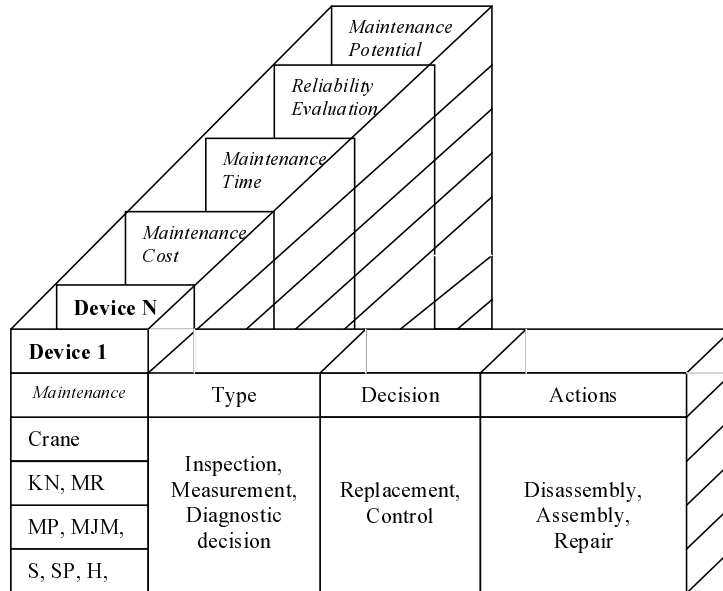


Fig. 5. Maintenance module for exploitation needs of the device

### 3. Final Remarks

The cranes maintenance management system shown above is an integrated platform, which enables the usage of collected information for decision supporting processes. Information collecting requires application of monitoring system. Because of complex relation between structure elements and big number of partial information, effective process` realisation should be supported by computer techniques.

#### ACKNOWLEDGEMENT

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