DINALOG
Dutch Institute
for Advanced Logistics

PREVENTIVE MAINTENANCE

THE SETUP OF A PLANNED PREVENTIVE MAINTENANCE SERVICE AT ALEWIJNSE MARINE ROTTERDAM

The perception of maintenance of technical assets has been subject to considerable change since the 1940s. Where it was first considered as a necessary evil, to be carried out only after an asset breaks down, in more recent years maintenance is considered as a business function which a company can benefit from. Within the maritime sector there seems to be interest in the benefits of maintenance as well. Therefore Alewijnse Marine Rotterdam has commissioned a research project the objective of which is to contribute to the setup of a third party preventive maintenance service.

ALEWIJNSE MARINE ROTTERDAM

As an electrotechnical service provider Alewijnse Marine Rotterdam (AMR) is already familiar with the concept of corrective maintenance of electrotechnical assets of ship-owners. AMR's Service and Maintenance department takes care of the repair of electrotechnical assets whenever ship-owners are in need of assistance. With respect to a future preventive maintenance service it is important for Alewijnse Marine Rotterdam to know which preventive tasks are required, how to organize such a service logistically and which classification regulations need to be followed.

ELECTROTECHNICAL ASSETS AND THEIR FAILURE MECHANISMS

Before one can elaborate on the preventive maintenance tasks it needs to be clear how electrotechnical assets fail. The focus has been on the failure mechanisms of switch gear, transformers, electric motors, generators and power cables. A study of the Failure Modes and Effects analyses performed by P. Gill (2009) reveals that the failure of electrotechnical assets is primarily related to the intrusion of moisture and dirt, and mechanical or electrical stress. In turn these stressors primarily cause corrosion of metal components, deformation of components and damaged insulation. On the outside these failure modes manifest themselves by degrading the structural integrity of assets, elevated operating temperatures, improper operation and loss of asset functionality.

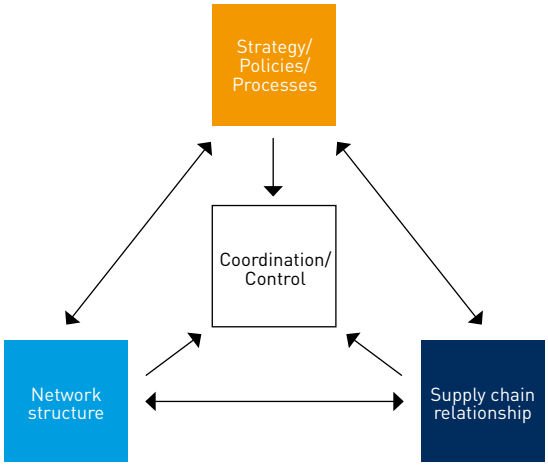
PREVENTIVE TASKS

The preventive tasks required to prevent the failure mechanisms described above can be summarized as follows. Keep electrotechnical assets clean, dry, cool and tight. This is translated into periodical periodic inspections, the focus of which is to ascertain that the equipment is still dry, clean, cool, and that connections are still tight.

SPARE PARTS MANAGEMENT

In line with Huiskonen (2001), spare parts management should be approached as a system containing four basic elements:

1. Strategy/policies/processes (e.g. service levels to offer)
2. Network structure (e.g. locations in the logistics system)
3. Supply chain relationships (e.g. degree of cooperation)
4. Coordination/control (e.g. performance measurement, incentive systems)



It is the interplay between the above elements that determine aspects such as: which parts to stock as spares; where to stock spares; when to order spares; the number of spares. However, information about the future expectations is not available to the author and neither is historical data. Therefore no statements could be made regarding which parts to stock, when to order and how many parts to order. Further research is required to properly address these issues.

CLASSIFICATION REGULATIONS

Finally, ship-owners need to comply with the regulations of classification societies. All ship-owners registered at a classification society need to respect some rules concerning maintenance (of electrotechnical assets). As a pilot study the regulations of the American Bureau of Shipping (ABS) were studied. Ship-owners registered at ABS need to conform to yearly and five-yearly maintenance surveys, the latter type being more extensive than the former. The objective of these surveys is to demonstrate the correct functioning of ship-owners' electrotechnical assets.

RECOMMENDATIONS

Since no concrete statements have been made about the management of spare parts, this is an important subject for further study. More input from potential customers will be required in order to make statements about how to manage spare parts, especially considering the global nature of the maritime sector.

Furthermore additional research is to be conducted into the cooperation between Alewijnse as an electrotechnical service provider and service providers with different specializations (e.g. mechanical service). After all, not every asset aboard ships is of an electrotechnical nature.

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