



Reducing the cost of preventive maintenance (PM) through adopting a proactive reliability-focused culture

M.C. Eti ^a, S.O.T. Ogaji ^{b,*}, S.D. Probert ^b

^a *Department of Mechanical Engineering, Rivers State University of Science and Technology, PMB 5080 Nkpohu, Oroworukwo, Port Harcourt, Rivers State, Nigeria*

^b *School of Engineering, Cranfield University, Bedfordshire MK43 0AL, United Kingdom*

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Abstract

The economic and political realities of the 1990s forced managers to reverse long-standing organizational cultures in order to reduce costs and energy expenditures in their organisations. For instance, these can be achieved, with respect to maintenance, by replacing a reactive repair-focused attitude by a proactive reliability-focused culture. Thereby far less (i) human effort is expended and (ii) energy would be wasted, both of which lead to increased profitability.

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1. Introduction

Within many large-scale plant-based industries, maintenance costs can account as much as 40% of the operational budget [1], and therefore improving maintenance effectiveness is

Abbreviations: CBP, current best-practice; CM, corrective maintenance; CMMS, computerized maintenance management system; FTM, fixed-term maintenance; HR, human relations; JIT, just-in-time; PDM, predictive maintenance; PM, preventive maintenance; RCA, root-cause analysis; RCFA, root-cause failure analysis; RCM, reliability-centred maintenance; ROFA, return on fixed assets; TPM, total productive maintenance; TQM, total quality management.

* Corresponding author.

a potential source for making financial savings. Today's competitive environment requires that industries try to sustain full production capabilities, while minimizing capital investment. From the maintenance perspective, this involves maximizing equipment reliability (i.e. uptime) including prolonging the equipment's life. Wise operation and careful maintenance should together deliver cost-effective production reliability: this should be the basis for shrewd management decision-making. Unfortunately many industries have been slow to implement preventive maintenance (PM) initiatives. For instance, in Nigeria:

- ~80% of maintenance costs are spent on facilities with a mean time between failures of 30 days or less,
- 30–40% of PM costs are spent on assets with negligible failure track-records, i.e. incorrect priorities are chosen and implemented.

Overall, the goal for an organization is to increase profitability. The maintenance and asset-management functions can increase profits in two main ways, i.e. by decreasing running costs and increasing capability. If the annual maintenance cost exceeds 5% of the asset value, the organization is probably in financial difficulties. The total maintenance cost depends on the quality of the equipment, the way it is used, the maintenance policy and the business strategy. The wise business owner buys equipment that will subsequently need little maintenance, i.e. is highly unlikely to fail [2].

By *automatically* monitoring multi-functional printers (displaying the behaviour parameters of the components being assessed), eMaintenance programs can continually track the performance of each component. eMaintenance can provide a customised solution and implement the corresponding preventive process, which can be tailored to satisfy the individual needs, by providing highly-accurate 'prior' information, as and when required, about the performance (and degradation) of each component. With this information, maintenance costs can be reduced, and the production process becomes more effective.

2. Maintenance

This should preserve components so that they fulfil their function(s). However continuing operation depends on the designers of the equipment, as well as its constructors and its operators, i.e. not just on the maintainers.

Developing and executing a maintenance strategy consist of three steps:

- formulate a plan of what needs to be done for each component (i.e. work identification);
- acquire the resources (skilled personnel, spares and tools) needed to execute the proposed procedure effectively;
- implement the strategy (i.e. acquire and deploy the systems needed to manage the resources effectively) [3].

To increase the equipment's uptime, at least cost, is the aim. A proactive profit-focused approach is needed to narrow the gap between actual costs and ideal costs. Downtime seriously bedevils the productive capability of Nigerian industries, so reducing average rates of output, increasing operating costs and interfering with customer service. Downtime can so easily increase as a result of the ineffective implementation of just-in-time (JIT) and lean

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