



Impact of corporate culture on plant maintenance in the Nigerian electric-power industry

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Abstract

Comparisons have been made of modern maintenance-practices, i.e. in the more developed economies, with what occurs in Nigeria. Significant differences arise due to variations in corporate culture, pertinent learning opportunities and effectiveness of strategic planning. The managerial implications of these divergences are discussed. A systematic, total productive-maintenance (TPM) approach needs to be adopted to allow corporate changes to be implemented at a rate commensurate with each organization's evolving culture. This paper advocates that maintenance should be managed better, in each organization, so as to cultivate a sense of ownership in the operators. Also autonomous maintenance-teams, consisting of operators, engineers and managers, should be set up with the aims of improving personnel competence and equipment performance.

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Abbreviations: EFQM, European foundation for quality management; JIT, Just-in-time; MBNQA, Malcolm Baldrige national quality-award; NEPA, Nigerian Electric-Power Authority; OEE, Overall equipment-effectiveness; RCM, Reliability-centred maintenance; TPM, Total productive-maintenance; TQM, Total-quality management.

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Introduction

Maintenance should renovate each physical system so that it is able to fulfil the function or functions for which it was designed: otherwise effort, time and hence energy may be wasted. Maintenance of equipment depends not just on those who undertake the maintenance function, but also on designers, purchasers and operators of the equipment. Thus, to achieve the optimal performance of the system, all of these should possess a detailed understanding of what needs to be done, and be able to and willing to do whatever is needed when required.

The development and execution of a maintenance strategy involves three processes:

- Formulate an effective maintenance-procedure for each component (i.e. via purpose and fault identification).
- Acquire the resources (i.e. appropriately trained people, spares and tools) needed to execute the strategy effectively.
- Execute the strategy (i.e. acquire and deploy the means needed to manage and maintain the resources efficiently) [1].

The need to increase equipment “uptime” (i.e. the periods when it is functioning normally) at least cost has necessitated a radical change in the tactics of maintenance. The organization should implement a proactive profit-focused approach to narrow the gap between actual and ideal costs for maintenance. Excessive “downtime” has always adversely affected the productive capability of the Nigerian electric-power industry, thereby increasing operating costs and leading to a deterioration of customer service and satisfaction. The effect of downtime has become more apparent by the worldwide movements towards just-in-time (JIT), lean operations and total-quality management (TQM) processes.

Maintenance, being a significant occupation for personnel, can account for up to 40% of the total cost of Nigerian electric-power generation. According to the annual International Competitiveness Report, there are *major* differences in maintenance effectiveness and individual outputs between individual countries. Consultants frequently quote 15% as being the maintenance cost gap between those of field leaders and the world-class average performance. In addition, the average potential for improving production, by implementing a proper maintenance scheme, has been estimated to be 6 → 8% [2]. For Nigeria, the corresponding figure is far greater.

Two strategies, which offer a path for achieving long-term continual improvement, rather than the promise of a quick fix, have attracted increasing interest within modern industries. These are reliability-centred maintenance (RCM) and total productive-maintenance (TPM).

RCM is a process which helps determine what must be done to ensure that any physical asset continues to do whatever its designers, and subsequently its users, want it to do [1]. In essence, two objectives are met: (i) determination of the maintenance requirements of the physical system and (ii) then ensuring that these requirements are met as cheaply and effectively as feasible.

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