



Case Studies

Setting Maintenance Priorities at a Power Generation Site

SUMMARY:

In December 2007, OMDEC completed a Maintenance Assessment Review for a New York Power Generation company. Site Management had two key goals – first to obtain an objective, independent assessment of their maintenance function, and second, to use the results to develop a road map for future maintenance performance improvement. The assessment took two weeks and resulted in a report to Management which included detailed findings and recommendations, an assessment of priorities based on impact, benefit and task precedence, and a Microsoft Project Plan showing task sequence and interdependence.

Three key priorities emerged:

- 1. the imperative of having a reliable and well-functioning maintenance management system to maintain and control the maintenance best practices and act as the core of the maintenance knowledge base;*
- 2. the requirement for an active program to enhance working co-operation between maintenance and operations;*
- 3. the need to establish and nurture a reliability center tasked with evaluating and developing new reliability analyses and maintenance practices.*

Site Management now has a well-documented forward path to follow in setting internal goals and budgets. As their target is to remain clearly the leader in the company's fleet, Management has adopted the report as a road-map for priorities and for the allocation of resources.

BACKGROUND AND OBJECTIVES:

The Power Generation site is a two unit, combined-cycle gas and steam turbine plant with a small on-site workforce. Rated at about 1000MW, it operates on a peak demand mode – which means that the emphasis is on having power available when called for from the power dispatch center at Head Office.

The site is recognised as the operations and maintenance leader in the company's overall fleet of about 20 units; despite this, Site Management had set a number of specific objectives:

1. To complete an objective review of the current maintenance function by an experienced outside organization.

2. To identify the gaps between the Site's current maintenance status and industry best practice, and with OMDEC experience at other power generators.
3. To develop a clear roadmap for setting action priorities to ensure their leading position in the fleet is maintained – but strongly emphasising what is realistically achievable.
4. To identify opportunities for cost and reliability improvements, subject to a “no layoff” condition.
5. To propose a means by which maintenance continuous improvement could become the standard practice.

PROCESS AND METHODOLOGY:

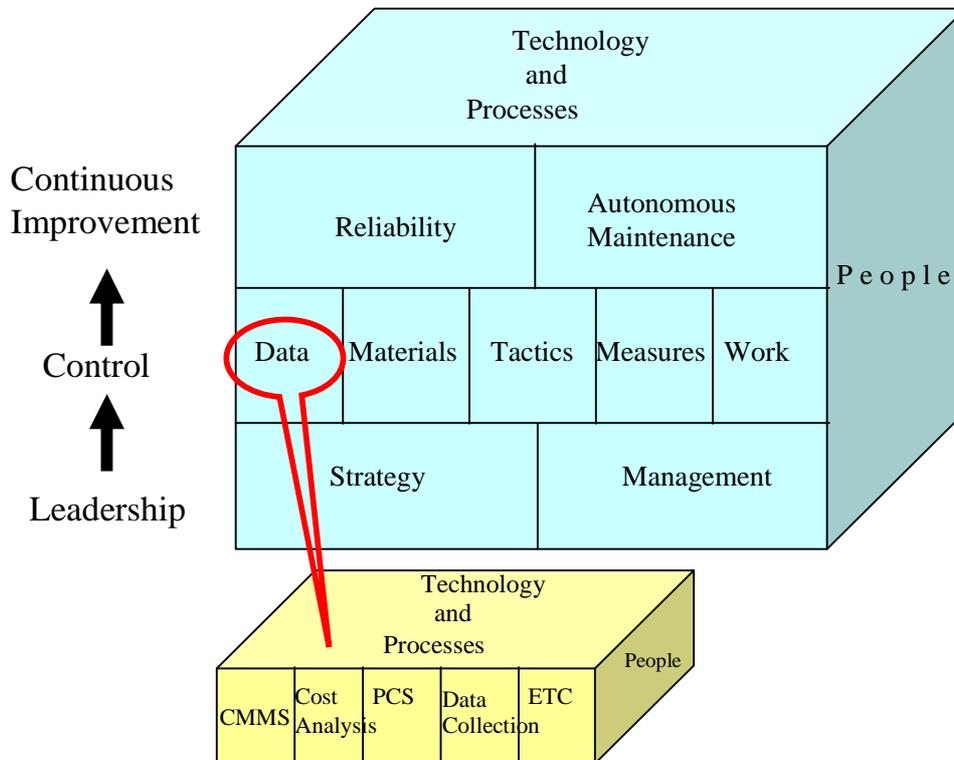


Early discussions with Site Management to discuss the scope and the objectives, produced OMDEC's initial recommendation to delay the assessment until some pending improvements had been made to the Maximo system. Instead, Site Management elected to proceed immediately with the assessment scope to include both pending and recommended Maximo upgrades. Management emphasized the basic rules: “tell it like it is, no subjects off-limits.”

A ten-step process was agreed on:

1. A review and analysis of basic documentation – such as Site objectives, capital plans, maintenance budgets, maintenance management reports, reliability data etc.
2. An introductory session with key staff to explain and discuss the objectives and process of the assessment.
3. A safety briefing, safety test and plant tour to familiarize with the layout, equipment, overall condition of the plant, maintenance shops and stores.
4. A series of group and individual interviews with all available staff – maintenance, operations, administration and management to understand the practical dynamics of the business. This is a key activity of the assessment as it provides an invaluable source of opinions, issues, successes, process details and opportunities.
5. A detailed questionnaire was delivered to all staff with the invitation to complete it anonymously. This provided a second opportunity for staff to share their views in confidence – and excellent views they were too!! The questionnaire followed the analysis model of the Excellence Cube (shown below, and developed from John Campbell's “Uptime”) to ensure full coverage of all maintenance subjects and their enablers. The results of the questionnaire were analysed to detect any

significant variances among the on-site departments, and variances from other similar organizations. These variances were verified and integrated into the final recommendations.



The Excellence Cube

6. To ensure maximum information sharing and feedback, daily debriefs were held with Site Managers to explore the findings and discuss the opportunities.
7. The collation of data led to the preparation of an interim report covering findings and recommendations.
8. The interim report was submitted to and discussed with Site Management to validate the key facts.
9. The final report consisted of three sections – (a) the report on the findings and recommendations, (b) a spreadsheet showing each recommendation qualified by the amount of effort required to complete it, the expected benefits, an indication of the required sequence of the tasks and the proposed priority, (c) a Microsoft Project plan showing the task precedence's and dependencies.
10. A final debrief presentation in which all staff were invited to question and comment.

This process was followed carefully, with numerous back-tracks to verify findings and test the applicability of the recommendations. Participation from the staff was enthusiastic, and the debates lively; and by no means were all of the suggestions and recommendations accepted without challenge.

RECOMMENDATIONS:

The Maintenance function was not broken; nevertheless there were many improvements that could realistically be introduced. These were summarized into five categories:

- A. The need to upgrade the content and use of Maximo was urgent. Without a solid base of reliable data, further improvements would be on very shaky ground. Specific recommendations included training local super-users who in turn have the mandate to help others in their area, cheat sheets for system tasks, focusing on correct data for critical equipment, concentrating on work order quality improvement and stores record accuracy.
- B. The balance of work and the on-going friction between Operations and Maintenance requires close and active attention. Clarification of who does what, combined with focused skills training, better matching of jobs with skills and improved feedback about tasks required and tasks completed were the major recommendations.
- C. Concentrate on continuous improvement through closer monitoring of work order and task quality, job performance and data review. Key proposals included formal debriefs and systematic root cause analysis on complex jobs completed, challenging targets for work planning, regular reviews of work order content and work processes to ensure improved practices, repatriating selected outsourced jobs and development of improved KPI's.
- D. Prepare to introduce reliability based maintenance. The first step is a cost/benefit analysis, but in parallel, plugging key gaps in data collection process will start to lay the right foundation. Following this, consistently linking PM's to failure modes and expanding condition-monitoring program are the next steps towards introducing reliability based maintenance.
- E. Some opportunities were identified for cost reduction, related to stores optimization and reduction in the use of external contractors.

CONCLUSIONS:

The level of co-operation from the on-site personnel was outstanding, opinions were freely given and thoroughly and openly debated; this augurs very well for the implementation of the improvement program. The results were closely examined for acceptability and the implementation program is well underway. Management's comment at the conclusion of the project: "The results far exceeded our expectations".