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Reduction in Outage Durations at ESKOM Power Plants in South Africa

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ABSTRACT

Inefficiencies and capacity constraints in the power industry, managed by government-owned ESKOM, has led to load-shedding across South Africa, and affected many consumers. Outage maintenance projects within the ESKOM environment revolves around shutting down units, disassembling machine components, refurbishing these components, dependent on the condition after inspections, reassembling the machine components, commissioning and synchronisation to the national grid. This research report sought to investigate the factors that are leading to increased durations of outages and increased costs, limited to the study of outage projects specific to the turbine, generator and auxiliary components. The critical aspects of performing an outage was determined, the constraints of the processes was reviewed and compared to best practice methods, and finally recommendations were stated to improve efficiency. A comprehensive literature review was completed with content specific to planned maintenance activities showing the optimum level of maintenance based on a balance between preventive and corrective maintenance. Previously published research pertaining to ESKOM was reviewed and results showed there are significant challenges in risk management, procurement practices as well as skills and training. Different types of best practice project management techniques were considered, such as 'Project Management Body of Knowledge' PMBOK, agile and lean methodologies. An exploratory approach was taken using participant observation at a specific outage project on a power plant. In order to triangulate results and ensure reliability and validity, secondary methods of research were conducted namely, interviews conducted with subject matter experts, and a document analysis. It was found that challenges experienced in terms of poor workmanship, lack of skills/training, variation from standard procedures/ processes, spares not being procured and supplied in time, and general overall poor planning, led to delays in the outage project. An emergent factor of poor cultivated culture amongst workforce leads to complacency and no importance on focused results. Further recommendations such as a review of outage philosophies, application of PMBOK for more structure in project management processes, application of lean techniques using the Timken South Africa model, and automated systems can lead to improved overall performance on outage projects by reducing time, and costs.