

## Reliability centred maintenance approach for the enhancement of reliability of process industries

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### **Abstract:**

RCM provides simple, precise and easily understood criteria for deciding technical feasibility of PM/PdM task in the particular context. This means that PM/PdM tasks are only specified for failures which really need them. This in turn leads to substantial reduction in routine workloads. Less routine work also means that the remaining tasks are done properly. This together with the elimination of counterproductive tasks leads to more effective maintenance. RCM creates awareness in Maintenance professionals regarding six patterns of failures. A maintenance professional as such comes to terms with the reality of randomness after decades in bathtub. Maintenance professionals thus realize that the idea of age related failures simply does not apply to random failures (Pattern D, E and F). An awareness of these facts has led some organizations to abandon the idea of PM altogether for failures with minor consequences. The complex nature of modern equipment and systems often leads to failures and, as a consequence, an increase in machine downtime, thus affecting production. The failures of machines cause disruptions in production, resulting in the loss of availability of the system and increase the cost of maintenance. This paper presents a reliability centered maintenance (RCM) methodology to improve the availability of carding machine in textile industry. The main objective of this paper is to present a RCM approach for improving the availability of the carding machine and thus maximize the production output. Failure mode and effect analysis (FMEA) is used for analyzing the failures in the machine. The preventive measure to reduce the failure frequency and its impact are proposed. The proposed preventive measures result in reduction of about 26% of the total downtime and availability improvement of approximately 1.7%, as

compared with the availability due to current maintenance practices. The purpose of this paper is to study the relationship between the reliability centered maintenance (RCM) implementation factors and productivity enhancement in the Indian process industries. Data for the analysis collected through a structured questionnaire from processing companies of India. Statistical analysis using bivariate correlation and one-way ANOVA techniques have been carried out. The study establishes the impact of RCM implementation factors on the productivity improvement in process industry and highlighted that the proactive maintenance technique can considerably improve the productivity and profitability of the enterprise. The emphasis on extracted factors will help processing companies in realizing the benefits of adopting RCM in their maintenance approach and achieving the key manufacturing performance parameters. The study is equally important and relevant in global scenario for risk reduction and providing the better safety climate with higher employee morale. Reliability Centered Maintenance (RCM) is a process that ensures maintenance tasks are performed in an efficient, cost-effective, reliable, and safe manner. Maintenance tasks may be preventive, predictive, or involve nondestructive inspections in order to identify or monitor flaws. RCM is one component of a comprehensive cradle-to-grave asset integrity management program. Likewise, an effective RCM program is one that will document the entire process throughout the system, equipment, or component life-cycle for every asset in the facility. The purpose of RCM is to ensure maintenance and inspection tasks are centered around improving the reliability and safety of equipment.