

## **An Approach for Improvement the Reliability Centered Maintenance (RCM) Based on Copulas Theory**

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**Abstract:** Nowadays the industry applies maintenance methodologies in order to increase availability and reduce costs. In this way it could be use the RCM (Reliability Centered Maintenance) could be used due to its characteristics. The RCM methodology is based on equipment reliability. This paper shows the drawbacks of the Log-Normal multivariate reliability assessment model, when there are correlative failure modes. And proposes copula theory in order to improve reliability assessment, considering dependence between failure modes. In this paper, the Gumbel copula is used to determine the replacement time and include these estimations on RCM methodology in order to improve the operative performance, reduce maintenance costs and improve work order. This work studies the effect of considering dependence between failure modes for the reliability assessment and maintenance activities program of Injection molding machine. Results considering dependence between failure modes, shown 66 % of savings in the annual maintenance cost. That is a direct benefit for company.

*Keywords:* Reliability Centered Maintenance, Copulas Theory, Maintenance Based on Time