

Proceedings of the 5th Annual World Conference
of the Society for Industrial and Systems Engineering,
San Francisco, CA, USA
October 13-14, 2016

Application of Reliability Centered Maintenance (RCM) Considering Uncertainty and Reduced Sample

M. Fuentes¹, D. González- González^{1,2}, M. Cantú³, and R.J. Praga-Alejo^{1,2}

¹Corporación Mexicana de Investigación en Materiales (COMIMSA), Calle Ciencia y Tecnología #790, Col. Saltillo 400
C.P. 25290, Saltillo, Coahuila, México. Phone: (+52) 01 844 411 32 00.

²Facultad de Sistemas, Universidad Autónoma de Coahuila, Ciudad Universitaria, Carretera a México Km. 13, Arteaga,
Coahuila, México. Phone: (+52) 01 844 689 10 30.

³Universidad Autónoma Agraria Antonio Narro, Calzada Antonio Narro #1923, Buenavista, CP. 25315, Saltillo, Coahuila,
México. Phone: (+52) 01 844 411 02 09.

Corresponding author's Email: marco.fuentes@comimsa.com

Abstract: Nowadays the industry applies maintenance methodologies in order to increase availability and reduce costs. In this way the RCM (Reliability Centered Maintenance) could be used due to its characteristics. The RCM methodology is based on equipment reliability; this is usually modeled using lifetime distributions. These models are used widely in engineering applications for assessing the reliability of some components. However, these kind of models need complete information and some assumptions for build probability density function. In engineering practice, it is well known that data sometimes cannot be recorded or collected precisely due to various uncertainties such as human and machine mistakes, incomplete information. In this way, the maximum entropy has shown to be useful for modeling uncertainty, this can be used to calculate the maximum entropy density function of uncertainty parameters more accurately for it does not need any additional information and assumptions. Finally, comparing traditional reliability models with maximum entropy model. In order to reliability assessment and define maintenance activities program of Injection molding machine. The results, considering dependence between failure modes, have shown 66 % of savings in the annual maintenance cost. That is a direct benefit for company.

Keywords: Reliability Centered Maintenance, Maximum Entropy, Maintenance Based on Time, Weibull Model