

Prioritization in a Maintenance, Repair and Overhaul (MRO) System Based on Fuzzy Logic at Iran Khodro (IKCO)

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Abstract : Maintenance, Repair, and Overhaul (MRO) of machinery are a key recent issue concerning the automotive industry. It has always been a debated question what order or priority should be adopted for the MRO of machinery. This study attempts to examine several criteria including process sensitivity, average time between machine failures, average duration of repair, availability of parts, availability of maintenance personnel and workload through a literature review and experts survey so as to determine the condition of the machine. According to the mentioned criteria, the machinery were ranked in four modes below: A) Need for inspection, B) Need for minor repair, C) Need for part replacement, and D) Need for major repair. The Fuzzy AHP was employed to determine the weighting of criteria. At the end, the obtained weights were ranked through the AHP for each criterion, three groups were specified: shaving machines, assembly and painting in four modes. The statistical population comprises the elite in the Iranian automotive industry at IKCO covering operation managers, CEOs and maintenance professionals who are highly specialized in MRO and perfectly knowledgeable in how the machinery function. The information required for this study were collected from both desk research and field review, which eventually led to construction of a questionnaire handed out to the sample respondents in order to collect information on the subject matter. The results of the AHP for weighting the criteria revealed that the availability of maintenance personnel was the top priority at coefficient of 0.206, while the process sensitivity took the last priority at coefficient of 0.066. Furthermore, the results of TOPSIS for prioritizing the IKCO machinery suggested that at the mode where there is need for inspection, the assembly machines took the top priority while painting machines took the third priority. As for the mode where there is need for minor repairs, the assembly machines took the top priority while the third priority belonged to the shaving machines. As for the mode where there is need for parts replacement, the assembly machines took the top priority while the third belonged to the painting machinery. Finally, as for the mode where there is need for major repair, the assembly machines took the top priority while the third belonged to the painting machinery.

Keywords : maintenance, repair, overhaul, MRO, prioritization of machinery, fuzzy logic, AHP, TOPSIS

Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development

Conference Location : Chicago, United States

Conference Dates : December 12-13, 2020