Trans RINA, Vol 159, Part A1, Intl J Maritime Eng, Jan-Mar 2017

INTERVAL-VALUED INTUITIONISTIC FUZZY TOPSIS-BASED MODEL FOR TROUBLESHOOTING MARINE DIESEL ENGINE AUXILIARY SYSTEM

(DOI No: 10.3940/rina.ijme.2016.a1.402)

D O Aikhuele and **F M Turan**, Faculty of Manufacturing Engineering, Universiti Malaysia Pahang, Malaysia, **S M Odofin**, Department of Physics and Electrical, Northumbria University Newcastle, UK and **R H Ansah**, Faculty of Industrial Management, Universiti Malaysia Pahang, Malaysia

SUMMARY

In this paper, we present an interval-valued Intuitionistic Fuzzy TOPSIS model, which is based on an improved score function for detecting failure in a marine diesel engine auxiliary system, using groups of experts' opinions to detect the root cause of failure in the engine system and the area most affected by failures in the diesel engine. The improved score function has been used for the computation of the separation measures from the intuitionistic fuzzy positive ideal solution (IFPIS) and intuitionistic fuzzy negative ideal solution (IFNIS) of alternatives while the criteria weight have been determined using an intuitionistic fuzzy entropy. The study is aimed at providing an alternative method for the identification and analysis of failure modes in engine systems. The results from the study show that although detection of failures in Engines is quite difficult to identify due to the dependency of the engine systems on each other, however using intuitionistic fuzzy multi-criteria decision-making method the faults/failure can easily be diagnosed.