

**Application of a Data Driven Methodology to Monitor the Operational Status of
Surveillance Radars**

Mohammed Mubarak Said Al-Hinai

Abstract

There are three main types of maintenance that can be conducted for a system: preventive maintenance, corrective maintenance and condition-based maintenance. Condition-based maintenance (CBM) is considered the most important field in maintenance nowadays because it is related directly to minimising cost and time to ensure availability of a certain system. In order to ensure making the correct decision based on the result of CBM, much research has been conducted to continue to develop the accuracy of CBM results. Most of the research used the parameter of failure rate of main subsystems that make the main system as a backbone for their studies. Then these parameters are used to give the probability of failures for each subsystem and to estimate the reliability of the main system. This research aims to monitor health status of a SMART-S radar by identifying the failure probability of the radar, by implementing a data-driven approach with both the radar's main units' failure records and internal fitted sensors (temperature and flowrate /pressure sensors) readings. The contributions of this research are to introduce for first time CBM to Royal Navy of Oman fleet maintenance facilities and to use live sensors' readings (by utilizing software to predict radar unit's conditions using sensors' readings) to prove software predictions results of radar unit's failure probability.