

ABSTRACT SUBMISSION FORM

Abstract submission closes on 21st July 2016. Late submission of an abstract may only be accepted subject to the discretion of the HUMS2017 Committee.

Title: Predicting Corrosion on F-35 Joint Strike Fighter

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Abstract (200 words max):

The F-35 Autonomic Logistics System utilises a Corrosion Management System (CMS) incorporating F-35 Corrosion sensors fitted to two locations of each aircraft and a Prognostic Algorithm (PA) to predict future sensor status and an associated corrosion state. The PA has been developed by BAE Systems Australia, in collaboration with Defence Science and Technology Group, and processes data from the sensors, along with data from the aircraft's Prognostics Health Management (PHM) system, such as flight and base location weather data, to provide maintenance advice for the corrosion condition of the monitored bays.

The PA predicts the internal bay corrosion condition and sensor performance through a number of steps. PHM data are analysed by the PA for instances of internal bay wetting. These instances are analysed as individual packets of wetness with respect to the release of corrosion inhibitors from the F-35 non-chromate primer, primer depletion rates. The propensity for corrosion is determined from the predicted inhibitor concentrations and summed over the aircraft lifetime to predict sensor response and resultant corrosion state. Over the course of the F-35 program the PA will be matured to include prediction of the internal corrosion condition in unmonitored bays and, as confidence is gained in the model output, its predictions will be used to optimise corrosion inspections and maintenance. The ability of the CMS to prevent unnecessary physical inspections will enable millions of dollars of maintenance savings throughout the life cycle of the F-35 platform.