

Congressional Response

Executive Summary

05 October 2021: The Office of the Under Secretary of Defense for Acquisition and Sustainment submitted a 28-page formal response to Senate Report 116-236, page 176, and accompanying H.R. 6395 to National Defense Authorization Act for Fiscal Year 2021.

The full report was sent to:

U.S. Senate

- Committee on Armed Services
- Committee on Appropriations

U.S. House of Representatives

- Committee on Armed Services
- Committee on Appropriation

The report examines the Department of Defense's strategic approach to address the persistent maintenance issue of intermittent electrical failures in DoD weapon system components.

- DoD and the Military Services are also applying "Big Data" analytics (e.g., DoD's Maintenance and Availability Data Warehouse (MADW)) and tailored toolsets to both better scope the intermittence problem and identify specific implementation opportunities.
- Intermittent electronics failures continue to be a leading contributor to DoD's \$3 billion annual No Fault Found (NFF) problem, unnecessarily consuming approximately 25% of the electronics maintenance budget annually and is a leading contributor to weapon system materiel availability issues.
- Intermittent faults occur as a result of various operational environmental stimuli, including, but not limited to, thermal stress, vibrational stress, gravitational G-force loading, moisture, and/or contaminant exposure. These circuit path disruptions are frequently caused by cracked solder joints; intermittent coax lines (e.g., shield corrosion, damaged center conductor, etc.); broken, cracked, or frayed wires; loose clamps; and unsoldered pins.
- One main symptom of an intermittent fault failure (IFF) mode problem is a high rate of Cannot Duplicate (CND or A-799), NFF, No Trouble Found (NTF), and Re-test OK (RETOK) reported by the maintenance activities and is characterized by decreasing reliability and Time-on-Wing (TOW) and has been conclusively identified as a major contributor to NFF costs and decreased materiel availability.
- OO-ALC's utilization and data results from the Intermittent Fault Detection & Isolation System (IFDIS) were presented at the Maintenance Innovation Challenge (MIC) which leveraged Reduction in Total Ownership Cost (RTOC) funding to help industry develop and demonstrate the first IFDIS application in DoD. OO-ALC became the early adopter of this technology and implemented IFDIS to improve materiel availability and reduce costs for the F-16 MLPRF Line Replaceable Unit (LRU). Success and potential demonstrated at OO-ALC created a breakthrough moment at the DoD enterprise-level and led to the formation of the holistic strategy described in this report.

Intermittent Fault Implementation Strategy

Chart 3



- The IFDIS and Portable Intermittent Fault Detector (PIFD) are the only objectively proven solutions to meet the requirements cited in MIL-PRF-32516 because of their ability to continuously and simultaneously detect and isolate random intermittent faults. IFDIS and PIFD automatically interrogate, through the use of Artificial Intelligence (AI), and store the as-designed wiring configuration of a known good unit, greatly reducing the time and cost associated with developing Test Program Sets (TPS), which are required for conventional testing.

(Note: throughout the report, Universal Synaptics is referred to eight (8) times, IFDIS 92 times, and the PIFD 22 times)