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Paper Title: Software Tool for Apache Maintenance Picture (STAMP)

Author:

Brian Stehle

Apache Development & Modernization

Alabama

( 313 )256 4779

[brian.c.stehle.mil@mail.mil](mailto:brian.c.stehle.mil@mail.mil)

Abstract: The Smart Tool for Apache Maintenance Picture (STAMP) application is an innovative solution to provide off-board Warning, Caution, Advisory, Fault and Exceedance (WCAFE) messages to maintenance personnel on the ground, enabling maintenance activities to start before aircraft return from missions. STAMP leverages the existing Apache helicopter System Level Embedded Diagnostics (SLED) capability by converting SLED data into plain text messages and then transmitting them real time over the current BFT network. Maintenance personnel receive these messages on the computer based STAMP application which enables pre-planning and posturing of necessary maintenance personnel, parts and tools. This capability also provides the command a real time view of which assets are available, enabling accurate posturing for on-going missions.

STAMP revolutionizes aviation maintenance operations by providing real time fault information based on high fidelity aircraft generated reports. Instead of waiting for aircraft to return home and counting on the pilots to remember and write up faults after landing, STAMP provides real time observation, enabling earlier maintenance preparation and posturing. Having actual aircraft information earlier in the process does three main things: 1) Helps reduce or eliminate possible misdiagnoses, 2) Enables necessary personnel, tools and parts to be correctly identified and assembled, and 3) Reduces trips and unnecessary equipment transport to and from the hangar. All of which contribute to a faster maintenance turnaround time.

By reducing misdiagnoses, STAMP also helps eliminate unnecessary tool and part usage, therefore optimizing the logistics footprint. This benefits users by reducing required on-hand quantities and lowering operational costs resulting from removing and replacing serviceable equipment. However, the most significant contribution is that STAMP enables maintainers to immediately begin bringing aircraft to an operational condition upon return as well as providing critical maintenance data for responding to Precautionary Landings requiring a Downed Aircraft Recovery Team (DART). STAMP changes the traditional serial process to a parallel maintenance planning and problem identification process while aircraft continue operations.

The value of STAMP is quantified by the many collateral benefits it brings. As mentioned, the most significant savings is time. Every flight utilizing STAMP will save approximately one hour of maintenance labor. This is estimated as the standard time to understand the problem and collect necessary tools and parts.

STAMP was demonstrated during the August 2014 AH-64E Apache Lot 4 Follow-On Operational Test & Evaluation (FOTE) and was very well received. The development cost for STAMP was less than \$500,000 and it can be classified at a Technology Readiness Level 7.

STAMP provides the aviation maintenance community a tool that enables faster, more appropriate decisions for aircraft repair. The foresight into aircraft maintenance posture prior to return gives maintainers a head start they have never had until now. Though aircraft quantities will remain constant within units, the ability to return them to operational status sooner creates greater flexibility to the command to provide operational mission assurance and support.

During the FOTE After Action Review, one maintenance Non-Commissioned Officer stated "I wish we had this at the unit now."