Department of the Navy SBIR/STTR Transition Program

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Topic # N112-111

Analysis and Reporting Capability for Smart Aircraft Data
BGI LLC

WHO

SYSCOM: NAVAIR

Sponsoring Program: AIR-6.8, Aviation Readiness & Resource Analysis

Transition Target: Enterprise Condition Based Maintenance Plus (eCBM+) Initiative

TPOC:
(301)757-2504

Other transition opportunities: PMAs -262 (MQ-4C), -275 (V-22), and -276 (H-1 Y/Z) endorsed the project and are intended recipients of the technology. All platform maintenance data management systems, such as those supporting Fleet Support Teams (FSTs) or similar maintenance operations across defense and commercial enterprises, can benefit.

Notes: An early version of the Analysis and Reporting Client (ARC) tool set has been deployed to the H-53E FST at NAS Cherry Point, and is in operational use. Collaboration between the FST and BGI continues to refine the performance and features of the tools.

DoD image VIRIN:195294-P-UOR35-506.jpg, available at
https://www.defense.gov/observe/photo-gallery/igphoto/2001135702/

WHAT

Operational Need and Improvement: DoD Instruction (DoDI) 4151.22 identifies CBM+ as an essential readiness enabler and a primary strategy for achieving cost-effective weapon system life cycle sustainment by reducing downtime, increasing operational availability, reducing logistics footprint, and reducing overall sustainment costs. CBM+ is facilitated by leveraging operational and maintenance data to identify key events and trends. ARC has demonstrated a capability to natively process smart aircraft and logistics data, which is already collected but underutilized, and provide actionable reports, reducing maintainer workload and turnaround time via the rapid integration of optimized predictive maintenance practices. ARC provides a plug-in based, configurable architecture that integrates with existing maintenance data management infrastructures.

Specifications Required: ARC provides an ability to ingest and synchronize time-series data from disparate sources. Via a graphical interface, analysts can define data processing relevant to their role, including trending, fault processing, prognostics, exceedance management, or other ad hoc criteria. Users can also design actionable reports based on NATOPS or other operational standards. Plug-in modules can be created to adapt ARC to additional platforms' data streams, logistics databases, or enterprise data stores. Experienced users can author advanced analysis scripts directly. A "Field" configuration allows users at the operational level to execute pre-defined analysis scripts to identify required maintenance actions or alert them to potential hazardous conditions.

Technology Developed: ARC provides a flexible, adaptable set of software tools ready to be integrated into your maintenance infrastructure; it is available for both WindowsTM and LinuxTM platforms. ARC features no ITAR-restricted content and so is available to international users.

Warfighter Value: Naval Aviation leadership has identified operational readiness as their number one priority. Advanced data collection capabilities of modern aircraft are only impactful to improved readiness if maintainers and analysts can quickly and efficiently extract insight from the data and execute effective predictive maintenance. Early users of the ARC technology have identified up to a 90% reduction in time required to analyze collected data. They have also cited cases where critical issues have been identified, preventing potential catastrophic mishaps. The data is available; ARC provides the ability to extract critical knowledge to improve operational availability, reduce costs, and save lives.

WHEN

Contract Number: N68335-18-C-0209 **Ending on:** January 14, 2022

Milestone	Risk Level	Measure of Success	Ending TRL	Date
End of Option 1	Low	Full H-53E capabilities	7	January 2020
End of Option 2	Low	Operational in eCBM+ Enterprise System	7	January 2021
End of Option 3	Med	Support for at least two additional platforms	8	January 2022

HOW

Projected Business Model: BGI is an innovative, veteran-owned business, merging the expertise of engineers, data scientists, and operational analysts to best support the warfighter. While ARC can enable CBM+ initiatives as delivered, it provides the greatest benefit to the enterprise when adapted and optimized to the data infrastructure, operational platform, and maintenance processes of the user. BGI seeks to support the deployment of ARC technology into additional US and international defense and commercial maintenance organizations. During initial start-up phases, BGI will execute the creation of required data ingestion plug-in modules, integrate ARC with existing maintenance data infrastructures, and train customer personnel. BGI can also tailor analysis and reporting capabilities to fit customer needs and current practices, easing the transition. In an ensuing sustainment phase, BGI can provide back-up analysis resources and support pop-up analysis needs or tool modifications.

Company Objectives: BGI has a demonstrated capability to collaborate with end-users of the ARC technology to optimize the tools, improve their performance, and expand their applicability. BGI is looking for additional partners within the Navy, other US Services, international services, and commercial aircraft operators to grow ARC capabilities across all domains.

Potential Commercial Applications: Advances in aircraft technology to allow collection of large amounts of maintenance and operational data is not unique to military aircraft. Commercial aircraft operators share the need to leverage the data collected to implement CBM+ initiatives and establish predictive maintenance practices, improving operational availability and reducing cost of operations.

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