NAVY Transition Assistance Program

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N061-005-0548 - Syncretek LLC dba FE Associates

Automatic Repair Planning and Part Archival System (ARPPAS)

NEED & CUSTOMER REQUIREMENT

Need: Modern aircraft are comprised largely of monolithic, sandwich stiffened, or discretely stiffened composite skins with metallic substructure. In response to localized repairs, composite aircraft parts change shape unpredictably and accrue residual stresses and strains that change the part's margins and may potentially impact performance or flight safety. A tool is needed to enable automated engineering assessment of composite aircraft part damage, nondestructive evaluation, and repair planning.

Value to the Warfighter: ARPPAS will provide a capability to the Warfighter and flight support crew to quickly, efficiently, and accurately assess and plan repairs to worn or damaged composite aircraft parts.

Operational Gap: The current technique for assessing the impact of repairs or weak spots on composite aircraft parts is to generate a work order for a weeks- or months-long engineering analysis. This analysis takes too long to support the operational requirements of modern aircraft repair, resulting in needless expense for replacement parts and potentially unknown flight safety status of repaired components.

Customer Specifications: ARPPAS automatically constructs a valid finite element representation of the repair area using user inputs. It is capable of taking loads from larger global models and accurately applying these loads to the model. ARPPAS also documents, references and enables sharing of completed repair projects.

Technology Description: ARPPAS is a software application that supports inventory management and couples structural analysis to parts in that inventory management system. It automatically recalls part histories, provides engineering drawings showing that history, performs structural analysis of the individual parts with their unique histories, and reports the results to users, all without any specialized knowledge on the part of the user.

SPONSORSHIP of original SBIR/STTR Topic

SYSCOM: NAVAIR

TPOC Phone Number:
301-995-7556

TECHNOLOGY DEVELOPMENT MILESTONES (SBIR/STTR)

Milestone	TRL	Risk	Measure of Success	TRL Date
Demonstrate Finite Element Analysis/Database Integration	2	Low	Coupled Databases	10/2006
Demonstrate Graphical User Interface Integration	3	Low	Successful Data IO via GUI	1/2007
Demonstrate Interchange of Data Between Multiple FEA Systems	4	Low	Successful transfer of Navy-provided model data between Patran and FEMAP	8/2009
Integration of Multiple FEA System Technology into ARPPAS	4	Moderate	Modification of ARPPAS and its GUI to accommodate analysis in either environment for test analysis model	10/2010

Open contract: N68335-09-C-0012 ending 10/10

TECHNOLOGY TRANSITION OPPORTUNITIES (PHASE III)

Other Potential Applications:
Navy and Air Force attack/strike aircraft - Northrop Grumman;
F-22 - Lockheed Martin Co.;
Navy Heavy Lift Helicopters - Sikorsky Aircraft Co.;
Commercial aircraft and MRO centers;
US Government Air Logistics Centers

Business Model:
Direct software sales and teaming. Key to the business will be development of appropriate part and engineering databases, and support for deployment by Air Logistics Centers, Fleet Operations Centers or their equivalent.

Objective:
FE Associates seeks Prime Contractors to team on contracted support for their aircraft programs. We also seek opportunities to expand the contracted scope of analytic support provided in ARPPAS and to integrate ARPPAS into the planned logistics program for a new aircraft.

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