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manufacturing technology program

Test Adapter Efficiency Improvement

Navy ManTech Project S2626

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National Shipbuilding Research Program
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Any opinions, findings, conclusions, or recommendations expressed in this presentation are those of the authors and do not necessarily reflect the views of the Office of Naval Research.

PROBLEM

This project builds on the theme that the complexity of electrical and optical connections in ships is costly. Previous Navy ManTech and NSRP projects have provided some methodology toward decreasing cable test costs.

SOLUTION

The upcoming project will validate methods that reduce the cost of automatic cable test, using the results of the previous projects. New and improved methods will enable Ingalls Shipbuilding to address system requirements of new ship programs. Results of this project are applicable to all ship programs at Ingalls Shipbuilding Gulf Coast operations.

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PROJECT PARTICIPANTS

PennState
Electro-Optics Center

DIT-MCO International

Ingalls Shipbuilding

GENERAL DYNAMICS
Land Systems

ULTRA
COMMUNICATIONS

ORGANIZATION and RESPONSIBILITY	TASK			
	1	2	3	4
Penn State EOC- project management, systems engineering, specific RF cable assembly development, and specific fiber optic development.	X	X	X	X
Ingalls Shipbuilding (Subcontractor)- ILTS integration into shipyard, reduction of connector and test adapter types, selection and testing of RF cable assemblies.	X	X	X	
DIT-MCO International (Purchased Services)- manufacturer of ILTS, ILTS development / updates, ILTS training.	X			X
Ultra Communications (Capital Equipment)- development of fiber optic module with OTDR functions, development of multi-pin fiber optic module.				X

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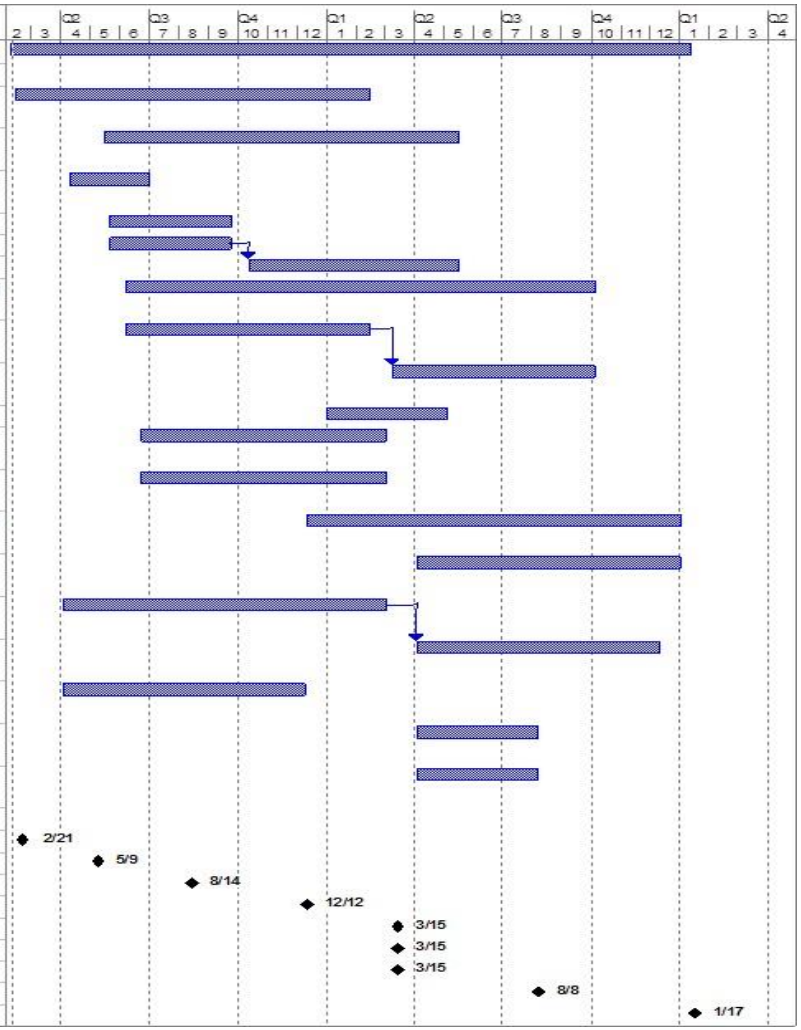
PROJECT SCHEDULE

ID	Task Name
1	**PROJECT PERIOD OF PERFORMANCE**
2	SOW TASKS:
3	2.1. (EOC) System integration into Ingalls infrastructure
4	2.1 (Ingalls) System integration into Ingalls infrastructure
5	2.1 (DIT-MCO) Return prototype to baseline configuration
6	2.1 (DIT-MCO) Requirements definition
7	2.1 (DIT-MCO) Software modifications
8	2.1 (DIT-MCO) Training
9	2.2 (EOC) Reduce number of connector and adapter types
10	2.2 (Ingalls) Reduce number of connector and adapter types (development)
11	2.2 (Ingalls) Reduce number of connector and adapter types (production)
12	2.2 (DIT-MCO) Test adapter construction
13	2.3 (EOC) Mitigate sustainment risk for specific RF cable assemblies
14	2.3 (Ingalls) Mitigate sustainment risk for specific RF cable assemblies
15	2.4 (EOC) ILTS Optical IL / RL Methods and OTDR Transceiver
16	2.4 (Ingalls) ILTS Optical IL / RL Methods and OTDR Transceiver
17	2.4 (Ultra-Com) Multimode OTDR transceiver and IL / RL methods
18	2.4 (Ultra-Com) Single mode transceiver and multi termini transceiver
19	2.4 (Ultra-Com) Measure multiple fibers simultaneously.
20	2.4 (DIT-MCO) Integrate OTDR transceiver into ILTS
21	2.4 (DIT-MCO) Integrate optical IL / RL methods into ILTS
22	MEETINGS
23	Kickoff Phase 1
24	Interim Review
25	Interim Review
26	Interim review
27	Final Review Phase 1
28	Milestone: Go / Nogo
29	Kickoff Phase 2
30	Interim Review
31	Final Review

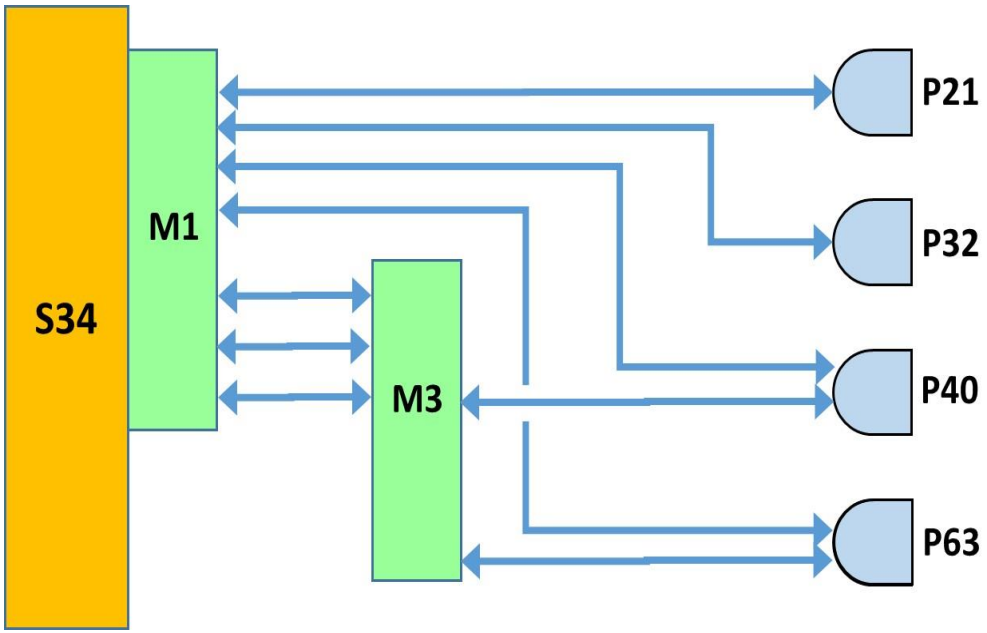


TASK: ILTS Integration into Shipyard

Using project results from the previous Navy ManTech S2306 Integrated Link Test System (ILTS) project, integrate the ILTS system into the Ingalls Shipbuilding data infrastructure. This consists of two technical parts: a) the hardware and test procedures which must comply with existing requirements, and b) shipyard data storage of link information, test procedures, acceptance criteria, test results, and diagnostics. This task occurs within the first phase (Base) of the project.

TASK: Reduction of Test Adapter Types

Using results from the ManTech ILTS project and the NSRP Flexible Interface for Automated Circuit Tester project, reduce the number of electrical connector and test adapter types. This project will develop algorithms for generally reducing connector types. Development activity is contained in the first (Base) phase of the project, and integration activity is contained in the second phase (Phase 2) of the project.



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TASK: Sustainment Risk for RF Cable Assemblies

Mitigate sustainment risk for specific obsolete RF cable assemblies by developing or identifying new components. There are many RF cable and connector types that are near obsolete. This project will identify acceptable replacements subject to ship and program qualification. This task occurs within the first phase (Base) of the project.

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TASK: OTDR and Multi Terminus Fiber Optic Unit

Develop insertion / return loss methods using a new type of Optical Time Domain Reflectometry (OTDR) arrayed transceiver developed under Navy SBIR projects. Development activity is contained in the first (Base) phase of the project, and integration activity is contained in the second phase (Phase 2) of the project.

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TRANSITION PLANNING & RISK MITIGATION

Two processes are used within Navy ManTech projects to guide project implementation and integration and to reduce associated risk:

TECHNOLOGY TRANSITION PLAN (TTP)

The TTP provides a sequence that is followed for implementation of project results. It includes required actions and resources. Signatures of key stakeholders are added upon plan approval. A Transition Event is identified- marking when the project results are owned by the shipyard.

RISK ASSESSMENT

The Risk Assessment is a weighted assessment of eleven risk factors including elements of technology, logistics, expense, and ecosystem. Different factors apply, depending on whether the project is a process change or a change to the final condition of a system or platform, and progress of the project. A mitigation plan is requested for risk items.

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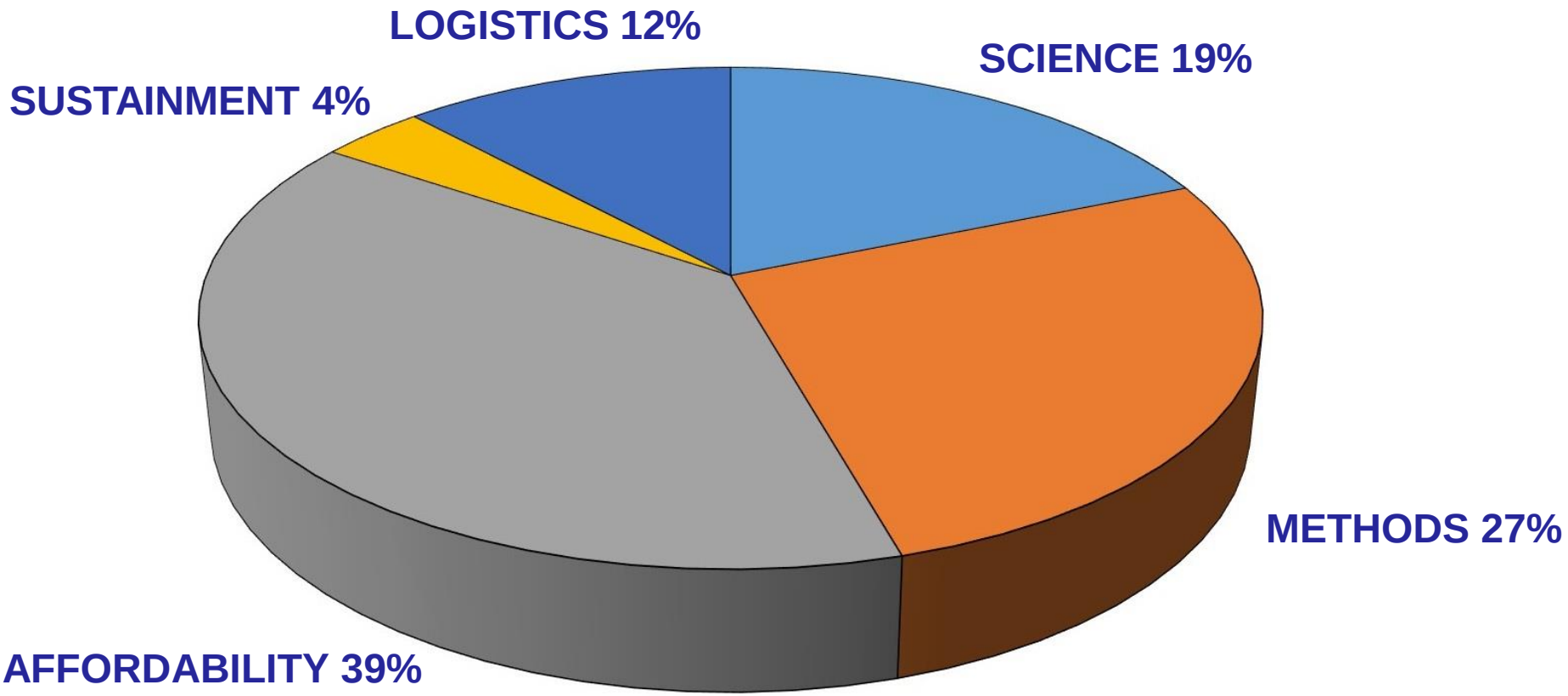
INNOVATION:



THANK YOU!

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ABSTRACT

This project builds on the theme that the complexity of electrical and optical connections in ships is costly. Previous Navy ManTech and NSRP projects have provided some methodology toward decreasing cable test costs, a) the Integrated Link Test System (ILTS) under Navy ManTech, and b) Flexible Interface for Automated Circuit Tester under the NSRP. This project introduces the ILTS to the Ingalls Gulf Coast shipyard, will further reduce the varieties of test adapter types, solve an RF connector sustainment issue, and add Optical Time Domain Reflectometry (OTDR) to the ILTS fiber optic test functions.