

# *NSRP ETP Project*

## *Enhanced Fiber Optic Testing for Cost Reduction*

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*San Diego, CA*

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# Project Scope

- This project will investigate the potential for fiber optic testing enhancement for cost reduction by evaluating the use on an Optical Time Domain Reflectometer (OTDR) to replace the Optical Loss Test Set (OLTS) and Optical Return Loss Meter (ORLM) in performance of Mil-Std-2042-6B required testing for shipboard installations.
- The commercial industry has adopted a source light launch condition for Multimode (MM) fiber called Encircled Flux (EF) that provide more accurate and repeatable loss measurements and have begun adopting OTDR testing results for full fiber optic network verification and acceptance for both Multimode and Single Mode (SM) systems. This project would determine the potential for transitioning this technology development to the shipboard environment.



# Project Scope Continued

- If determined feasible, the OTDR could be used in place of the OLTS and ORLM to perform multiple tests at the same time that are currently performed separately and eliminate the need for several tests that must be performed at various stages during the construction process. In addition, the OTDR test results would provide enhanced data that is not currently captured resulting in reduced time for system acceptance and identification of potential faults for expedited troubleshooting and repair during construction.
- Primary investigation will take place to verify that test results obtained with the OTDR provide the precision and repeatability that would allow the elimination of separate OLTS and ORLM testing as required in Methods 6C1, 6E1, 6K1 and 6L1. The enhanced OTDR testing could be used to perform each of these test at the same time resulting in significant labor cost savings.



# Project Value Expectation

- The labor reduction that could result from successful findings for this project will show significant cost savings relative to current manpower required for shipboard testing in adherence to Mil-Std-2042-6B. Fiber Optic Testing Manpower requirements could be reduced by as much as 77% if OTDR testing could be fully implemented in place of the existing requirements.



# Project Task Areas

1. Evaluation of current manpower requirements, by platform and test method, in performance of current Mil-Std-2042-6B mandated testing.
2. Forecasted manpower reductions if OTDR testing could be used in place of current Mil-Std requirements.
3. Evaluation of current Navy approved fiber optic test equipment specifications for comparison against commercial industry test equipment specifications with a focus on launch conditions.
4. Test Plan Development to identify Test configurations and material requirements.
5. Material procurement and test plant configuration.
6. Testing of various fiber optic link and channel configurations common to shipboard topologies using: A) Current Navy approved test equipment, B) commercial EF complaint OLTS test equipment (for MM), and commercial OTDR equipment complaint with an EF launch condition.
7. Comparison of the test results to identify the reliability and repeatability for each test equipment configuration.
8. Careful analysis to determine if the OTDR test results provide the precision, reliability and repeatability required for adoption for shipboard mandated testing.
9. Final Report

# Project Team

- KITCO Fiber Optics
- NSWCDD
- EXFO
- HII-Ingalls
- HII-NNS



# Current Status

- KITCO Fiber Optics under contract 11-19-15
  - EXFO

SCRA pursuing contracts for remaining team members:

- NSWCDD
- HII-Ingalls
- HII-NNS

Anticipated Project Kickoff Jan 2016 with completion  
NLT 12/2016.



# Contact information

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