

NSRP | National Shipbuilding Research Program

Alternatives to Fiber Optic Connectors

2015 Electrical Technologies Panel Project



Distribution Statement A: Approved for public release.

Motivation

PROBLEM

Fiber optic connectors are meant for situations where frequent mate / demate is required. In Navy ships, present fiber optic link margin could be reduced if the connector loss and its instability were reduced. Fusion splicing is a useful alternative, but few cable restoration methods and splice enclosures are available.

OPPORTUNITY

Splices (particularly fusion splices) are a low loss / high stability alternative to fiber optic connectors, and are commonly used in commercial applications.

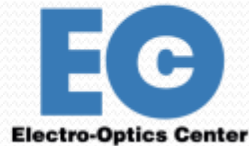
OBJECTIVE- Increase number of situations where fusion splices can be used.

Identify accepted splice methods, cable restoration methods, and splice enclosures.

BENEFIT- Decrease link budgets and margins for fiber optic links. Increase stability and reliability of fiber optic connections over lifetime. Increase maintainability.

Project Team

PENNSSTATE



Ingalls Shipbuilding

A Division of Huntington Ingalls Industries



DAHLGREN

PANDUIT



GENERAL DYNAMICS

Electric Boat

GENERAL DYNAMICS

Bath Iron Works

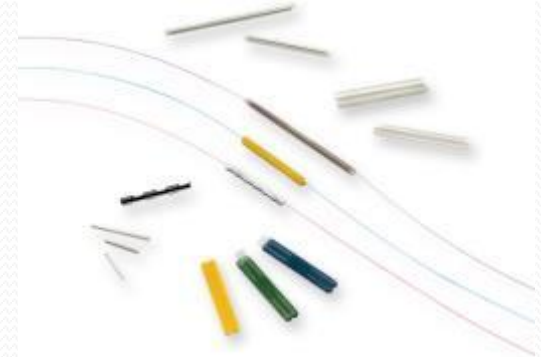
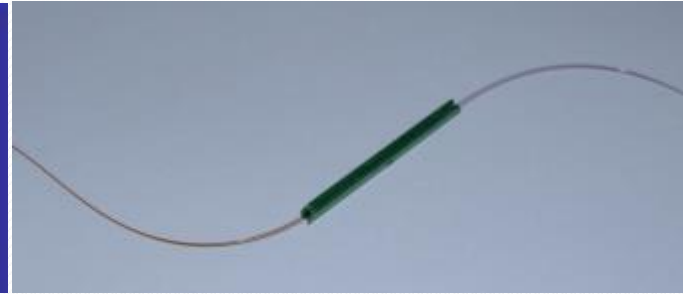
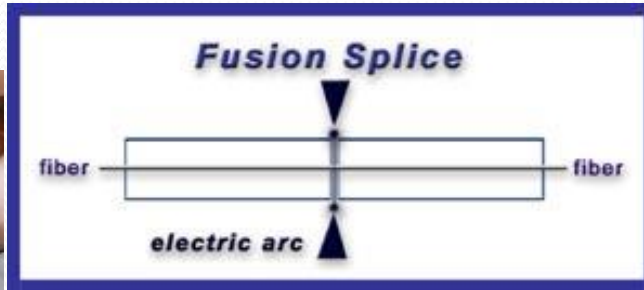
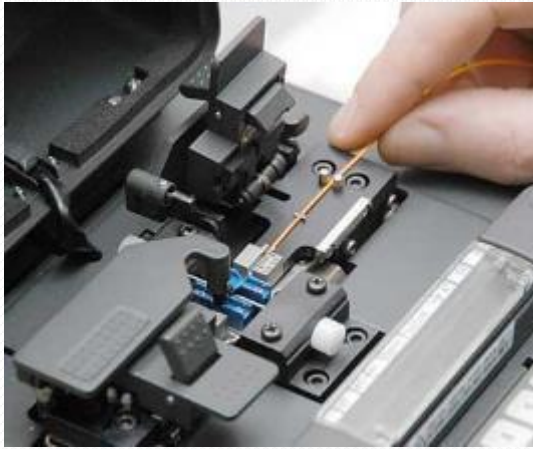
Technical Approach

For SPLICES, CABLE RESTORATION, and SPLICE ENCLOSURES:

- Identify alternate solutions and applications
- Identify qualified devices and qualification gaps
- For promising devices, conduct testing for shock and vibration tolerance

Emphasis on replacing CONNECTORS with FUSION SPLICES to improve loss performance, stability, and reliability.

Splice



Mechanical Splice



Corning CAM Splice



TE Corelink



Siemon Ultrasplice

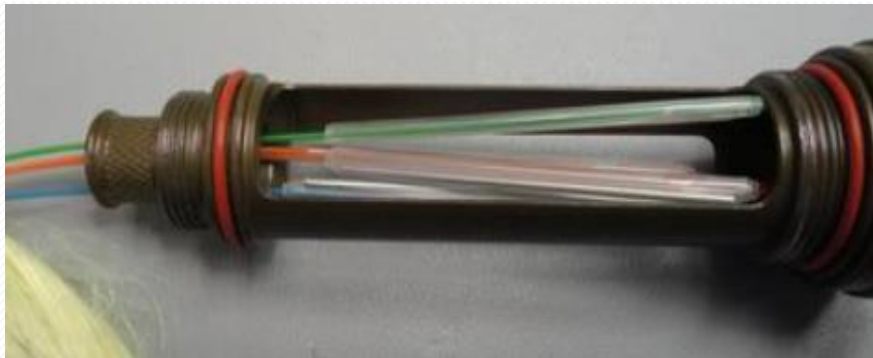
Cable Restoration



3M Large / XL Splice Case



Panduit FOSM



Glenair Corporation



TE Connectivity

Splice Enclosure



Present Splice Enclosure



TE Connectivity FOSC 450



Starfighter Enclosure



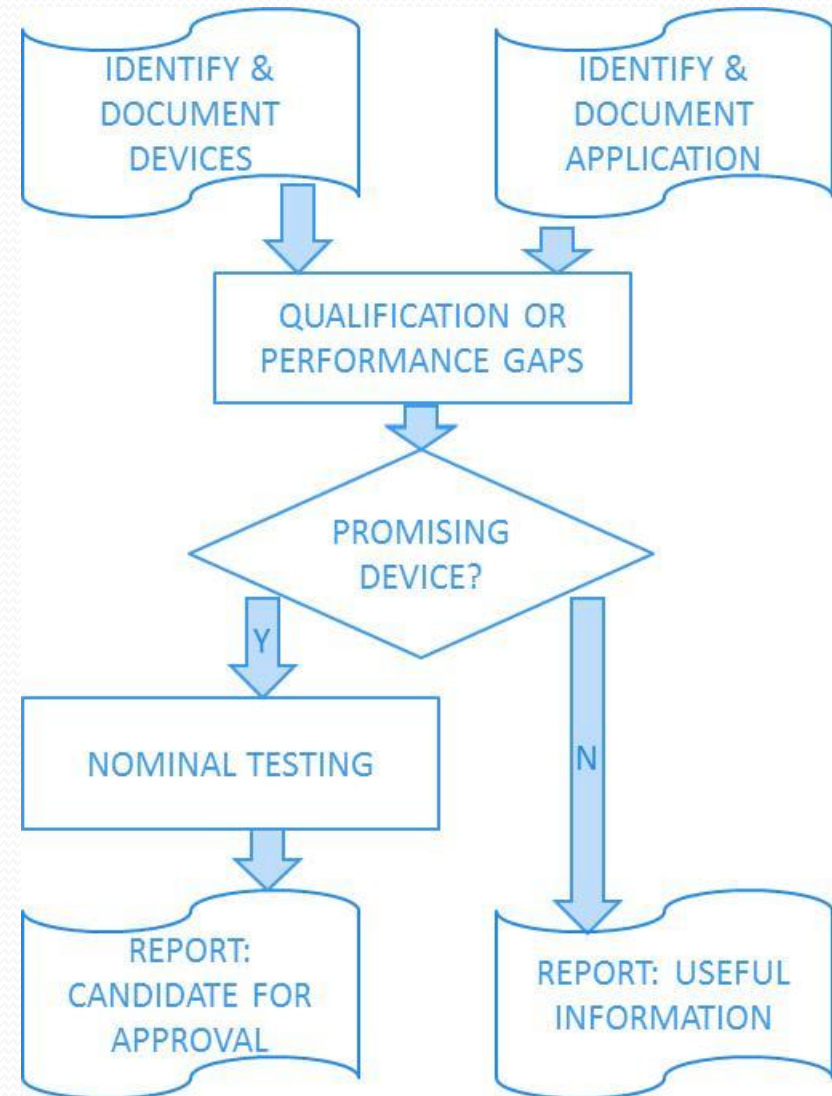
3M Small Fiber Optic Splice Case

Project Flow

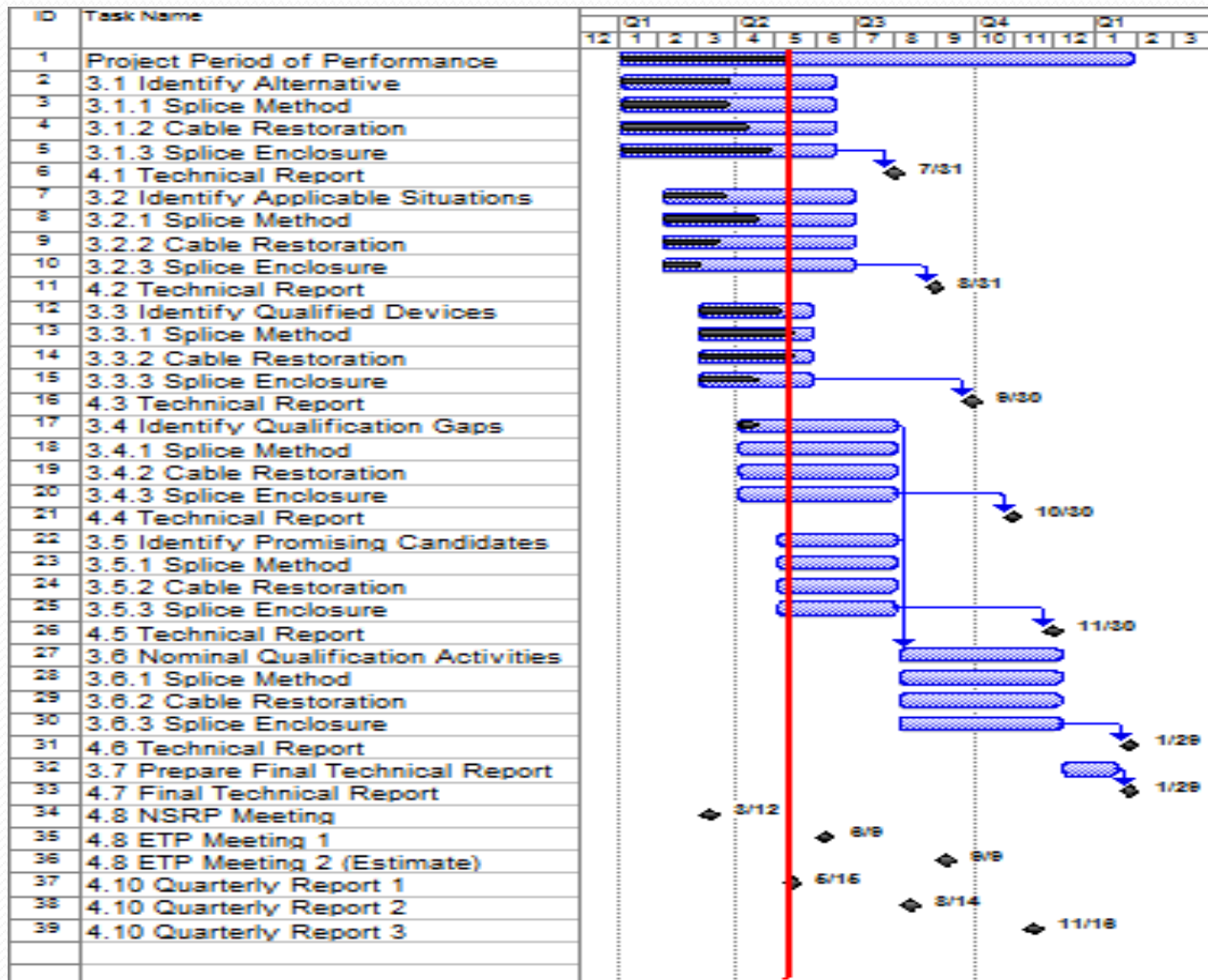
Two technical phases:

- 1) Divergent- gather information.
 - 2) Convergent- downselection.
- >> Nominal testing.

Information sharing via SharePoint site.



Project Schedule



Project Accomplishments

- Kickoff teleconference April 1.
- Work meetings April 22, May 14, June 3.
- Device and application data on SharePoint site.
- Helpful data:
 - Link distance summary from KITCO.
 - Decision matrix from Ingalls Shipbuilding.

Project Deliverables

✓	5/15/15	Quarterly Report 1
	8/15/15	Quarterly Report 2
	11/15/15	Quarterly Report 3
	7/31/15	Technical Report- Alternatives
	8/31/15	Technical Report- Applicable Situations
	9/30/15	Technical Report- Qualified Devices
	10/31/15	Technical Report- Qualification Gaps
	11/30/15	Technical Report- Promising Candidates
	1/31/16	Technical Report- Nominal Testing
	1/31/16	Final Project Report



Thank you!