

## **State of the Panel** Electrical Technologies Panel

Jason Farmer, Panel Chair

*Huntington Ingalls Industries, Ingalls Shipbuilding*

# Electrical Technologies Panel

## Purpose

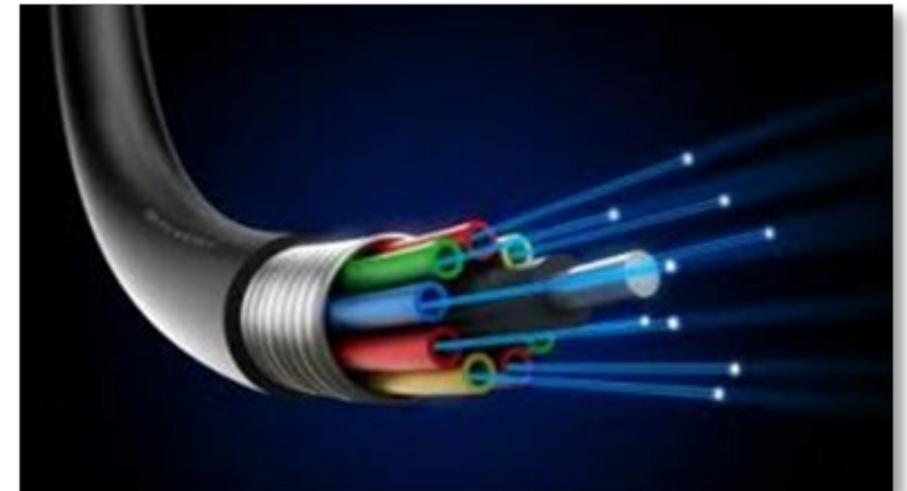
- Evaluate & transition improved electrical system technologies, installation processes, and electrical system specifications.
- Facilitate collaboration with the Navy and industry to identify & implement electrical technologies, processes, and best practices.

## Goal

- The goal of the Electrical Technologies Panel is to improve shipboard electrical systems and installation processes to achieve reduced cost, improved performance, and improved safety.

**Focus Areas:** The panel's focus is to identify and implement technologies and processes that improve:

- Total Ownership Cost
- Energy Efficiency
- Electrical System Performance
- Safety of Workforce and Ship's Crew



# Electrical Technologies Panel Overview

- Typically hold 3 meetings/year
  - Collaboration with other Panels
  - Technology Area Meetings focus
  - Facility Tours where available
- Areas of Interest
  - Electrical Installation & Testing
  - Fiber Optics
  - Solid State Lighting
  - Switchgear Inspection
  - High Temperature Insulated Bus Pipe
- 2022 Panel Meeting Recap
  - Spring Meeting
    - April 28, 2022
    - Virtual Format
  - Summer Meeting
    - Aug 10-11, 2022
    - University of Connecticut (Storrs, CT)
    - Tours: UConn Research Park and CCAT
  - Winter Meeting
    - December 13, 2022
    - Virtual Format

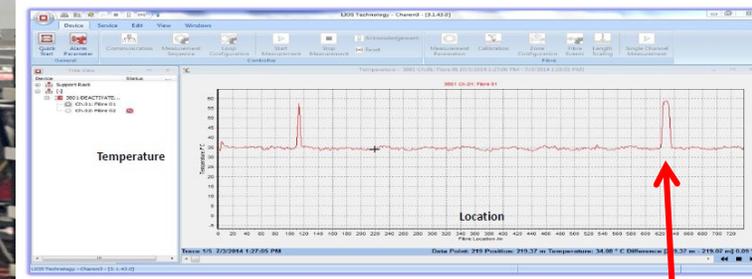
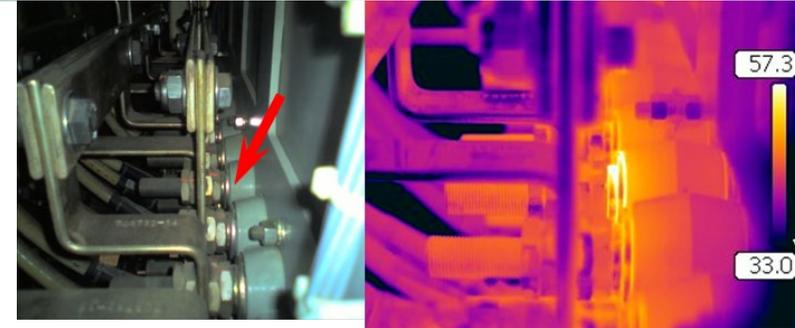


# Panel Activities

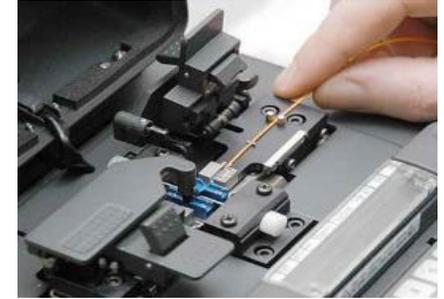
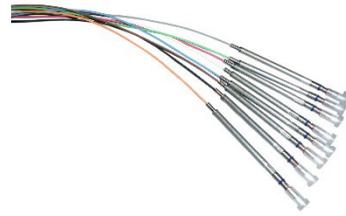
- **Panel Projects:** ETP Projects address many areas of shipboard electrical systems
  - Electrical Connections & Testing Methods
  - Cableways and Cable Installation
  - Fiber Optic Networks
  - Lighting Systems
- **Industry Events:** Panel members participate in industry events in support of Technology Transfer
  - SNAME Maritime Convention
  - MFPT Annual Meeting
  - NAVSEA Working Groups
  - NSRP Day at NAVSEA
  - NSRP Panel Meetings
  - ShipTech

# Electrical Connections

- Panel Projects
  - Improved Methods for Bonding & Grounding
  - Materials & Components for Exterior Electrical Connections
  - Safer Inspection of MV-HV Systems
  - Electrical Connector Standardization
  - Shore Power Connector Testing
  - AMUET 4.0 (2022 RAP Project)
  - DTS Integration Into Ship Electrical Plant Monitoring & Controls



# Fiber Optics



- Panel Projects

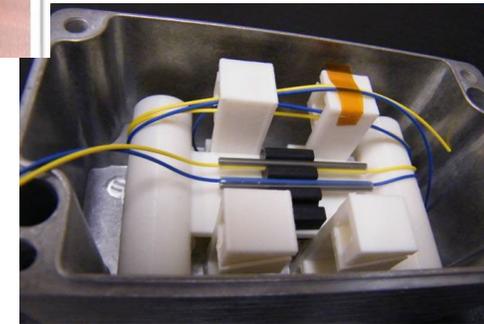
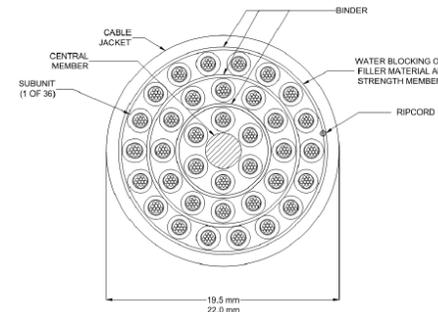
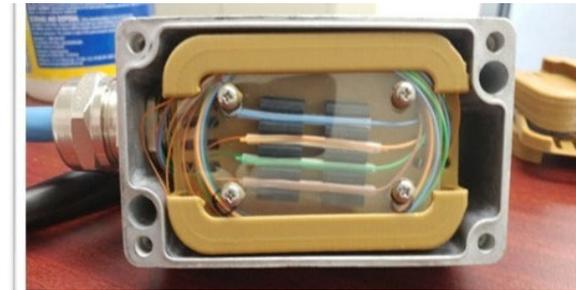
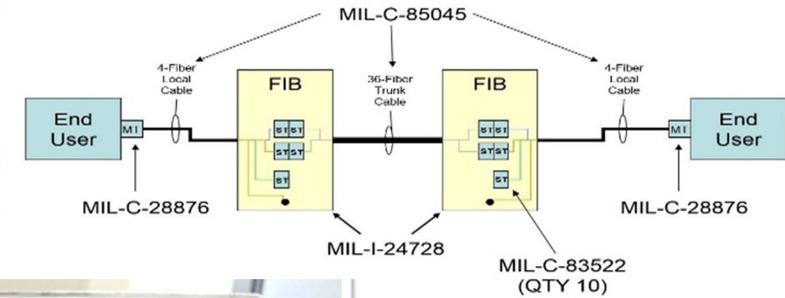
- Alternatives to Fiber Optic Connectors

- Fiber Optic Testing Enhancement for Cost Reduction

- Fusion Splice Enclosure at Equipment

- Splice-On Fiber Optic Connectors and Termini

- High-Density Ribbon Fiber Optic Cable & Tooling



# Cableways & Installation

- Panel Projects
  - Shipboard Cable Trays
  - Shipboard Fiber Optic Cables Design Enhancements
  - Evaluation of Efficacy of Self-Sealing Cable Transit Devices for Aluminum Bulkheads and Decks in Non-Watertight Boundaries
  - AMUET 4.0 (2022 RAP Project)



Figure 12 – Unexposed Side of Cable Tray (100% Cable Fill (A-60))



SAMPLE 1  
Rad - Tset



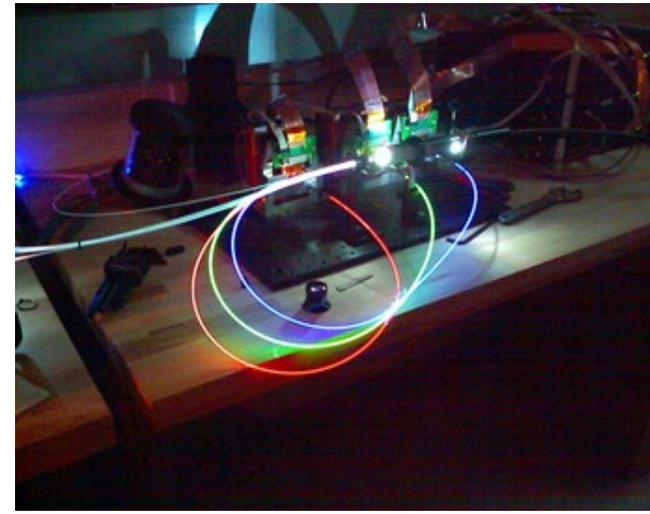
SAMPLE 2  
Mold Cure - Tset



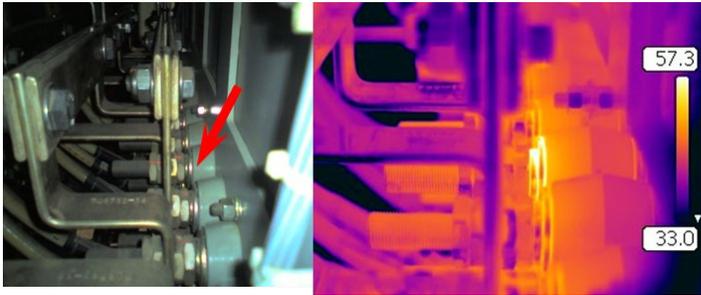
SAMPLE 3  
Tplastic

# Lighting

- Panel Projects
  - Advanced Topside Lighting System
  - Low Voltage Lighting Feasibility
  - OLED, Low Voltage Shipyard Lighting

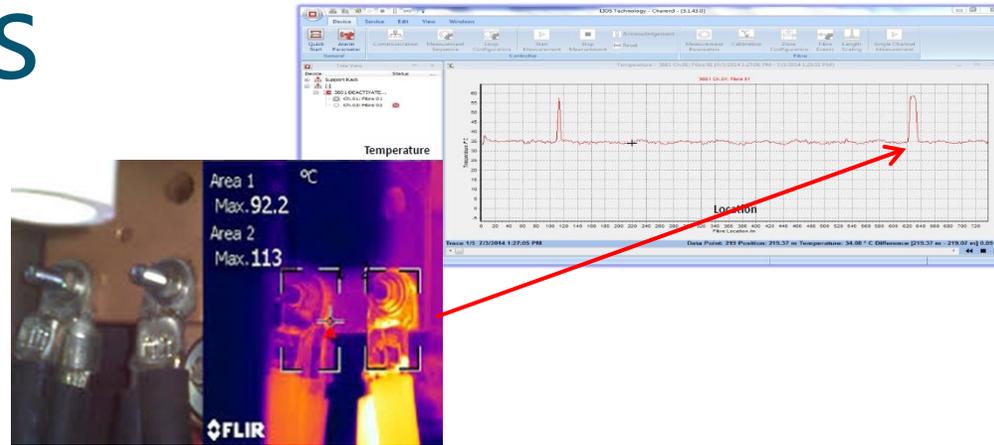


# Project Benefits



## Electrical Switchgear Inspection

- ✓ Improved Safety
- ✓ New Methods Implemented in MIL-DTL-32483
- ✓ New Technologies Identified & being implemented in current NSRP tech development efforts
- ✓ Significant time savings for inspections



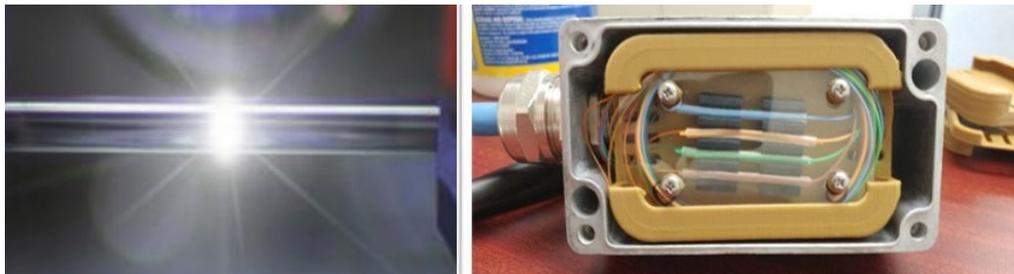
## Improved Electric Plant Monitoring

- ✓ Reduce Life-Cycle Costs
- ✓ Reduced Detection Time
- ✓ Supports CBM initiatives



## Flexible Test Adapters – Circuit Testing

- ✓ 3D Printed Designs
- ✓ Significant Cost & Schedule Improvements
- ✓ >75% Reduction in connectors



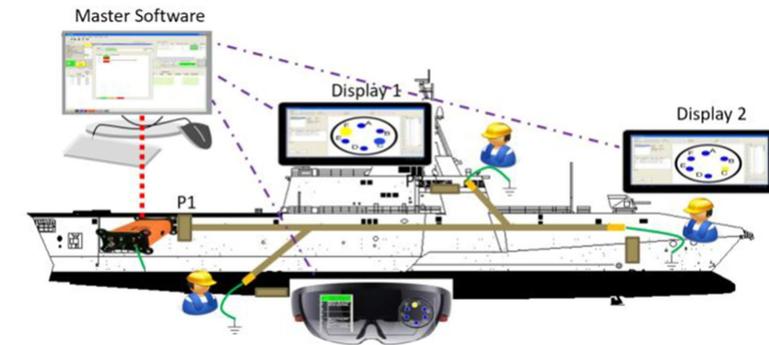
## Fiber Optic Connections

- ✓ Installation Efficiency
- ✓ Acquisition Savings
- ✓ >70% Improvement



## Shipboard Cableways

- ✓ New Hardware Evaluated
- ✓ Improved Efficiency
- ✓ >10% Improvement Target



## Circuit Testing and Installation

- ✓ Automated circuit testing
- ✓ Improved cableway installation tool
- ✓ Successfully transitioned to shipyard

# Near Term Activities

- Electrical Technologies Panel Break-Out Meeting
  - Thursday, March 30, 2023
  - 8:00 am – 4:30 pm
  - Room #6
- Planning underway for Summer Panel Meeting

# Questions?

