

CASE STUDY

Testing New Shore Ties for Ship to Shore Communications

A Case Study in Using **MELTRIC®** Multipin Plugs and Receptacles for Rugged Longevity, Reduced Cost, and Improved Man Hour Demands

"This unique conductor capacity feature cuts the cost of replacing shore ties in half, saving countless man hours in repairing and constructing new shore ties."

*Daniel P. McGregor – USCG ESD
Guam, IT1*



ZERO FAILURES



SIGNIFICANT COST SAVINGS



REDUCED MAINTENANCE



ENHANCED DURABILITY



IMPROVED OPERATIONAL EFFICIENCY

INTRODUCTION:

The US Coast Guard in Guam operates in one of the most challenging environments on the planet. With its proximity to Typhoon Alley, Guam experiences extreme weather conditions, including heavy rainfall, high temperatures, and extreme humidity. These conditions place immense stress on electrical connections, which are crucial for maintaining operations and communications for moored cutters. To address ongoing issues with their current shore tie connectors, the Coast Guard conducted a study to evaluate the performance of MELTRIC® multipin plugs and receptacles compared to their regular standard (RS) connectors.

THE PROBLEM/GOAL:

The primary issue faced by the US Coast Guard was the high failure rate and maintenance demands of their RS shore tie connectors. These connectors, originally designed for indoor electrical applications, were not suited for the harsh marine environment of Guam. Specifically, the connectors:



- Had a **high failure rate** with a maximum average service life of just 8 months.
- Required **significant maintenance**, consuming dozens of man hours for fabrication and repair.
- Were constructed from aluminum, making them **vulnerable to corrosion and degradation** in marine conditions.
- Had a **limited conductor capacity**, necessitating the use of multiple shore ties for larger cutters, thus increasing costs and failure points.

The goal of the study was to find a more durable and reliable solution that could withstand the harsh conditions, reduce maintenance time and costs, and improve overall operational efficiency.

SOLUTION: MELTRIC MULTIPIN DEVICES

The Coast Guard implemented a 13-month study to test the performance of MELTRIC multipin plugs and receptacles. These connectors were chosen for their robust construction, which included:

- Fiberglass reinforced thermoplastic nylon **designed specifically for harsh outdoor and marine environments.**
- Up to **36 conductor capacity**, significantly more than the 12 conductors (6 pairs) of the RS connectors, thereby reducing the number of shore ties needed.
- A **Type 4X watertight rating** to prevent saltwater intrusion and enhance durability.
- **Environmental resistance** to electrical shock, chemicals, and UV rays.



13 MONTHS
USAGE

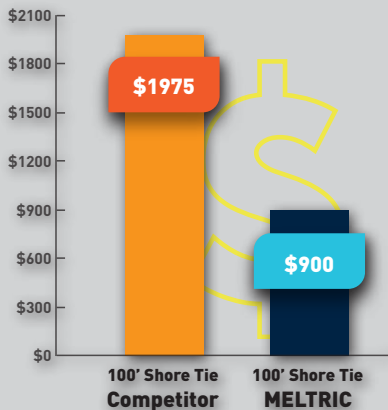


RESULTS: 50% TOTAL REDUCTION

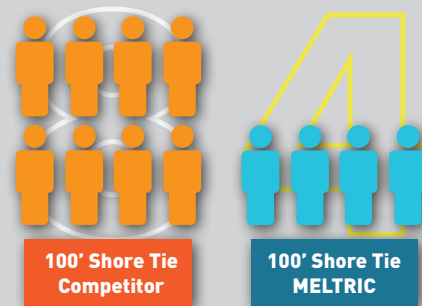
The results of the study were overwhelmingly positive, demonstrating the clear advantages of MELTRIC connectors over the existing RS connectors:

- **Zero Failures:** Throughout the 13-month study, the MELTRIC connectors did not fail once, maintaining performance and appearance as if they were new.
- **Cost Savings:** The MELTRIC connectors reduced the average cost per shore tie from \$1975 to \$900. This cost reduction was due to the longer lifespan and higher conductor capacity, which minimized the need for multiple shore ties.
- **Reduced Maintenance:** The study showed a significant decrease in man hours required for fabrication and maintenance. The time needed to fabricate a shore tie using MELTRIC connectors was cut in half, from 8 hours to 4 hours.

COST COMPARISON



MAN HOUR COMPARISON



Adjusted for inflation, 2008-2024, rounded to the nearest dollar.

BENEFITS:

- **Improved Operational Efficiency:** With the increased conductor capacity, larger cutters no longer required two shore ties, simplifying the setup and reducing potential failure points.
- **Enhanced Durability:** The MELTRIC connectors' construction materials provided superior resistance to the harsh marine environment, including protection against saltwater, UV rays, and physical impacts.

Overall, the adoption of MELTRIC multipin plugs and receptacles provided the US Coast Guard with a more reliable, cost-effective, and durable solution, ensuring uninterrupted operations while significantly reducing maintenance burdens.



ABOUT USCG ESD GUAM:

ESD Guam operates as part of USCG Sector Guam, which is a tenant command of US Naval Forces Marianas (COMNAVMAR). Situated on the island of Guam at 13°N, 143°E, ESD Guam is responsible for supporting the Information Technology and Electronics needs of Coast Guard assets across Guam, Saipan, Japan, and Singapore, both ashore and afloat. The team consists of a Chief Electronics Technician as the Supervisor, alongside three IT Specialists and three Electronics Technicians. ESD Guam's parent command is ESU Honolulu, located in Honolulu, Hawaii.

THE WORDS OF DANIEL P. MCGREGOR – IT1:

Daniel P. McGregor, IT1 of USCG ESD Guam, showcased the innovative use of MELTRIC shore tie connectors at the USCG Innovation Expo in November 2008. His interest in MELTRIC stemmed from recurring issues with their existing RS connectors, which caused **“compatibility problems when cutters [were] deployed to other districts.”** McGregor observed that the hardware used in fabricating these RS connectors was fundamentally ill-suited for the harsh marine environment, compounding the challenges posed by the lack of standardization.

He further highlighted that the RS connectors' limitations significantly restricted **“the number of connections that can be configured for each cutter,”** which is crucial in such demanding settings. During the testing phase, McGregor noted that the MELTRIC multipin devices **“provide[d] two times the available conductors, eliminating the need for a second shore tie.”** This feature alone cut **“the cost of replacing shore ties in half”** and saved **“countless man hours in repairing and constructing new shore ties.”**

At the end of the test period, McGregor was thoroughly impressed with the results, stating that **“the MELTRIC connectors appeared almost new”** and exhibited **“none of the corrosion, rust, or saltwater damage that was”** prevalent on the RS connectors. Overall, McGregor expressed his satisfaction with the MELTRIC connections, which demonstrated a **“zero failure rate during testing”** and remained in place **“for 13 months with no degradation in performance or maintenance required.”**



Based on USCG ESD Guam's experiences, we recommend that those in harsh marine environments explore MELTRIC devices for their robust and rugged build quality.



Contact MELTRIC to try a **free plug and receptacle** today. Make safety and efficiency top priorities in wastewater treatment. Your community and environment depend on it.

meltric.com

4765 W. Oakwood Park Drive • Franklin, WI 53132
414-433-2700 • mail@meltric.com

©2024 MELTRIC Corporation. All rights reserved. CS GUAMSHORTIE

 **MELTRIC**
A COMPANY OF MARECHAL ELECTRIC