

Pacific Battle Damage Exercise



During the Pacific Battle Damage Exercise, the NAVSEA 05T NESAR (Navy Expeditionary Sustainment and Repair) team will be evaluating advanced technologies for shipboard repair and maintenance. Enclosed is a sample of the technologies.

Key Objectives & Activities

- **Technology Validation Testing:** NESAR uses realistic repair scenarios to test tools for potential permanent placement on ships to enhance self-sufficiency. Validation testing to include ease of operation with limited training to first time users.
- **Strategic Positioning:** Evaluated products may be integrated into future shipboard battle damage support kits distributed globally, ensuring maintenance can be performed at the “point of need”.
- **Operational Readiness:** By vetting these tools in a maritime environment, NESAR aims to reduce reliance on domestic shipyards and maintain deployed assets during active missions.
- **Maintenance Provider Applicability:** Evaluated products may also be integrated into normal planned maintenance to availabilities to reduce mandays and critical path schedule. Implementing new technologies into planned maintenance should increase familiarity in preparation for Battle Damage Assessment and Repair (BDAR) requests.

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2026 Pacific Battle Damage Exercise

PBDE '26 Technology Categories: An Overview

This document outlines the eight primary technology categories being demonstrated and evaluated during the Pacific Fleet Battle Damage Exercise 2026 (PBDE '26). The focus of these evaluations is to integrate advanced, rapidly deployable solutions to enhance expeditionary battle damage assessment, repair, and operational safety.

- 1. Ship and Personnel Safety:** To ensure the continuous safety of repair teams, this category evaluates autonomous and remote monitoring technologies capable of detecting unsafe environmental conditions such as smoke, heat, and poor air quality. Key demonstrations include autonomous firewatch and thermal monitoring by BLACKSTARTECH, STATA, and Consilium; continuous air quality sensors from Industrial Scientific, NIMOY, and Aeroqual; advance fire protection from Firelce Solutions; and critical data transfer communication integration provided by Persistent Systems.
- 2. Power Generation:** When traditional shipboard power is compromised, rapidly deployable alternative energy is critical for recovery. This category assesses portable power systems designed to support repair operations in confined or inaccessible spaces without the use of traditional combustion engines. Evaluated technologies include Nabors' Hydrogen and Electrical Generation System, Sentient's portable power modules, and Western Global's pier-side fuel storage solutions.
- 3. Cold Spray Repairs:** Focused on restoring structural integrity in a maritime environment, this scenario demonstrates high, medium, and low-pressure cold spray technologies for immediate component repair. VRC Metal Systems, SOLVUS, and HAMR will showcase high-pressure systems, while Rosebank/Centerline and Titomic will provide medium and low-pressure solutions. PSU-ARL will support the demonstrations as the cold spray specialist liaison. MACTECH will provide in-place machining support, and HYTORQ tools will be used for expedited disassembly and Reassembly
- 4. Fiber Optic and Electrical Cable Repair:** Restoring shipboard data and power networks is vital for returning a damaged vessel to the fight. This category evaluates the speed and effectiveness of personnel using emergency repair kits to correlate, test, and repair damaged cables, utilizing the Agile Cable Repair System from DIT-MCO International and the Fiber Optic Emergency Repair Damage Control Kit developed by NSWC Dahlgren Division.
- 5. Piping Inspection and Repair:** This scenario focuses on conducting rapid piping assessments and executing battle damage repairs using safe, hot-work alternatives, which will be subsequently validated by hydrostatic testing. The evaluations feature advanced fittings from Viega, LOKRING, and Parker, composite piping from NOV-DXPE, and adhesive or magnetic patches from SUNREZ, 3M, and MAGNASEAL. Eddyfi and ENFASCO will provide the necessary inspection and cold surface preparation tools.

6. **Visualization - Battle Damage Assessment (BDA) Interior:** To safely assess internal battle damage, teams will deploy specialized access and visualization tools rather than risking human entry into unknown environments. CN-Seamless provides portable cutting tools for initial access, allowing interior inspection drones (Modal AI, Skydio, Flyability) and uncrewed vehicles (FLX Solutions, Deep Trekker) to stream real-time 3D assessments. Data integration and handheld scanning are supported by HEXAGON, NESAR, and University of Houston. NESAR team will also transmit audio distant support with 3M provide respirators as required.
7. **Visualization and Scanning – Exterior Drone and ROV Inspection:** For exterior areas that are inaccessible or unsafe for personnel, this category leverages drones and Remote Operated Vehicles (ROVs) to conduct structural inspections, precision draft mark surveys, and underwater hull scans. Participants include Skydio, Flyability, and Modal AI for aerial inspections, OKSI for precision draft readings, and Blueye Robotics for underwater ROV scans, all integrated through NESAR and the University of Houston’s networking systems.
8. **Bulkhead, Hull and Deck Inspection and Repair:** This critical category tackles the rapid inspection and repair of damaged shipboard structures to maintain watertight boundaries and restore structural strength. Solutions range from Kongsberg-Ferrotech’s underwater robotic arms and flood-control adhesives by Magnaseal and TDA Research, to structural overlays provided by Marine Offshore Management. Additional rapid repair and inspection technologies are supplied by Sunrez, 3M, Eddyfi, Composites Automation, CN-SEAMLESS, and Enfasco.

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Bulkhead, Hull and Deck Inspection and Repair Scenario

Basic Plan:

Underwater hull inspection and repair via **Kongsberg-Ferrotech** dry chamber, robotic arm cofferdam on the exterior hull, below the waterline to weld repair damage and validate repair via NDT process through the hull. Stop flooding is needed with **TDA Research’s** flexible underwater curing adhesive applied from the exterior side of the hull. **Magnaseal**, uses a series of high strength magnets embedded in a neothane blanket to instantly seal on a ferrous hull. It can be applied interior or exterior to the hull. **CN-SEAMLESS** can provide a robotic arm used to assist with any of these technologies by going over the side to assist lifting and/or handling. Once internal damage is identified, evaluation of the damage extents can be accomplished by Eddyfi Lyft PEC (Pulse Eddy Current) equipment through **Eddyfi Technologies**. **Sunrez** specializes in UV-activated, rapid-curing resins, prepregs, and putties for structural, composite, and metal repairs, curing in minutes rather than hours. Other technologies include **3M VHB Tape**, that allows patching without mechanical penetrations that could compromise watertight boundaries or introduce corrosion points. Larger repairs to either decks or bulkheads will be accomplished via **Marine Offshore Management** “Sandwich Plate System” (SPS) process to have the crew repair to adequate tightness in through hole damage, becoming load bearing immediately. Minor grinding with an **Enfasco** cold milling power tool for shaping of the hole will assist by allowing quick preparation of the damage. Then overlays will be placed using a fast-curing resin. **Composites Automation LLC** will use their computer algorithm to scan, evaluate laminate weight and orientation with a scheme to repair damage to structure through hole. Once provided, a crew will accomplish a fast-installed repair.

Shipboard Location(s): Troop Living (01-41-0-L), Wardroom (02-41-01-L), Helicopter Hangar (1-80-0-A), AFFF Station #5 (1-106-2-Q), and Emer Gen Room No. 2 (01-125-2-E)

Desired Results / Objectives:

- Accomplish quick inspection, evaluation and repair to damaged areas of the ship to maintain tightness or return to adequate strength

Companies and Technologies Involved:

Company	Technology	Role in Scenario	Integration /Interoperability Notes
Kongsberg-Ferrotech	Underwater Robotic Arm	Evaluate/Repair wet side hull damage	Crane/Divers assisted
Magnaseal	Magnetic patch	Stop flooding potential	Quick acting
TDA Research, INC	Underwater Repair	Stop flooding potential	Quick acting
CN-SEAMLESS	Robotic Arm	Cut accesses and provide welding support	mobility
Eddyfi Technologies	Surface inspection	Evaluate damage extents	Internal pipe inspection
Sunrez	UV Cure tape	Fast damage repair	Quick acting
3M	Damage Patching	Fast damage repair	Quick acting
Marine Offshore Mgt	Damage Repair	Fast damage repair	Quick acting
Enfasco	Surface Prep	Cold milling surface prep	Damage preparation
Composites Automation	Damage Repair	Fast damage repair	Quick acting



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Pacific Battle Damage Exercise (PBDE) 2026 Scenario - Cold Spray Repairs

Scenario Title: Cold Spray (High Pressure or Low Pressure) repairs to various ship components

Basic Plan:

High Pressure Cold Spray: VRC will perform in place repair of sealing surface on EDG room cooler face using high pressure cold spray. Solvus/HAMR/PSU-ARL will perform sealing surface repair on 5 inch valve using high pressure cold spray. In addition to the valve, they have the option to work a tank flange face located in the AFFF room.

Medium/Low Pressure Cold Spray: All Medium/Low Pressure system vendors will perform repairs on simulated LCS aircraft tie down cup. There will be a dozen of these cups present for end users to work with. Rosebank with Centerline equipment will perform solo flange repair on battle dressing room tank. Will machine in place/perform standing water test. Aft Battle Dress station. Titomic will perform solo flange repair on battle dressing room tank. Will machine in place/perform standing water test. Aft Battle Dress Station. All Medium/Low Pressure system vendors will perform various component repairs/sprays brought to the Cold Spray Alley which allows users to get familiarized with each of the pieces of gear/experiment. HAZMAT Room FR 100 STBD. All Medium/Low Pressure system vendors will perform repairs on three flanges at different heights/orientations. Perform repair of tank flange face (AFFF Station #4).

Shipboard Locations: Emer Diesel Gen Rm No. 2 (1-128-2-E) / AFFF Station #6 Frame 115 STBD / AFFF Station #4 Frame 87 Aft Aux Battle Dress Station Frame 97 STBD / Frame 100 STBD side (HAZMAT Room) / Upper V

Desired Results / Objectives:

- Desired results include repair to specification for each ship component in maintenance availability. If needed for return to station, then repair for usage

Companies and Technologies Involved:

Company	Technology	Role in Scenario	Integration / Interoperability Notes
PSU-ARL	Cold Spray Specialist	Lead Facilitator	Work with vendors to assist in cold spray functions
VRC Metal Systems	HP, MP and LP Cold Spray Vendor	Technology Provider	Provides equipment and training for various cold spray technologies
SOLVUS	HP Cold Spray Vendor	Technology Provider	Provides equipment and training for cold spray technology
HAMR	HP Cold Spray Vendor	Technology Provider	Provides equipment and training for cold spray technology
Rosebank/Centerline	MP and LP Cold Spray Vendor	Technology Provider	Provides equipment and training for various cold spray technologies
Titomic	MP and LP Cold Spray Vendor	Technology Provider	Provides equipment and training for various cold spray technologies
Mactech	In place machining	Pre and post machining	Assist with cold spray repairs
HYTORQ	Fastener removal	Expedite repair preparation	Assist with cold spray repairs



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Pacific Battle Damage Exercise (PBDE) 2026 Visualization and Scanning Scenario

Scenario Title: Visualization and Scanning – Exterior Drone and ROV Inspection

Basic Plan:

- Deploy drones (OKSI, Skydio X2D, Skydio X10, Modal AI, and Elios 3) to conduct structural inspections on the ship’s exterior that is inaccessible or unsafe for human accomplishment.
- Deploy drones (OKSI, Skydio X2D, Skydio X10, and Elios 3) to conduct survey of all draft mark positions.
- Deploy small boat crew to validated draft mark readings using traditional draft tube method.
- Deploy Blueye X3 ROV to conduct underwater security scan and visual inspection of the hull.

Shipboard Location(s):

Upper Vehicle Storage (3-41-0-A)

Ship’s Exterior (Mast)

Ship’s hull near the water line (FWD and AFT draft mark areas)

Desired Results / Objectives:

- Prove live feed feasibility via drone support using TWINFRA and DSK.
- Validate TWINFRA ability to ID battle damage accurately (before and after models).
- Prove real-time (imaging and analytics) with the goal to achieve desired accuracy .
- Compare drone performance to traditional methods.
- Prove draft mark accuracy readings of 1/16” in controlled pier-side environment and 1/8” while underway.

Companies and Technologies Involved:

Company	Technology	Role in Scenario	Integration / Interoperability Notes
Skydio	X2D drone	Provide video feed	Rugged thermal and optical sensors for inspections.
	X10 drone	Provide video feed	High resolution optical sensors for detailed imaging, ideal for precise exterior assessments.
Flyability	Elios III Drone	Provide video feed	Small caged drone to allow for safe interior flights.
Modal AI	Stinger Drone	Provide video feed	Compact design. Minimal pilot training.
OKSI	Drone with RAPIDD System	Provide video feed	Stereo vision with onboard AI processing for repeatable, precision draft readings.
Blueye Robotics	Blueye X3 ROV	Provide UW video	Under water high resolution visual inspection of hull
NESAR	Distance Support Kit	Sends data off site	Relay live feed and data offsite from various sources.
Univ of Houston	TWINFRA	Data integrator	Processes and live-streams Skydio and GoPro footage for analytics and visualization.



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Fiber Optic and Electrical Cable Repair Scenario

Basic Plan:

- Fiber Optic
 - Prepositioned fiber optic cables will be damaged during detonation onboard ship.
 - Utilize the Fiber Optic Emergency Repair Damage Control (DC) kit to match cables.
 - Repair fiber optic cables utilizing the Emergency Repair DC kit.
- Electrical
 - Cut electrical cable bundle.
 - Utilize the Agile Cable Repair System (ACRS) to match cables.
 - Repair electrical cables.
- Evaluate ability of repair personnel to effectively use the Fiber Optic Emergency Repair DC kit and the ACRS.

Shipboard Location(s):

- Multiple workspaces throughout the ship.

Desired Results / Objectives:

- Fiber Optic
 - Successful repair of fiber optic cables
 - Successful continuity testing.
- Electrical
 - Successful repair of cables
 - Proper matching of damaged cables.
 - Successful testing.
- Repair personnel effectively use the Fiber Optic Emergency Repair DC kit and the ACRS to complete and repair damaged cables.

Companies and Technologies Involved:

Company	Technology	Role in Scenario	Integration / Interoperability Notes
DIT-MCO International	Agile Cable Repair System (ACRS)	Electrical Cable Correlation & Matching	Independent Operation
NSWC Dahlgren Division	Fiber Optic Emergency Repair Damage Control Kit	Fiber Optic Cable Repair	Integrate with portable, point-of-need power supply



Fiber Optic Emergency Repair Damage Control Kits



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Pacific Battle Damage Exercise (PBDE) 2026 Visualization and Scanning Scenario

Scenario Title: Visualization - Battle Damage Assessment (BDA) Interior

Basic Plan:

- Gain access through a bulkhead into battle-damaged areas utilizing CN-Seamless.
- Deploy visualization tools (Modal AI, Skydio X10, Skydio X2D, Elios III, FLX BOT, TWINFRA, Hexagon, Schemata, and DSK with 3M PAPR, for preliminary assessment and 3D scanning.
- Open an interior tank and deploy UUV (Deep Trekker DTG3).
- Conduct BDA within the space using RAPID (TWINFRA) to integrate drone/FLX BOT video and DSK to provide live feeds of the battle damage spaces to local and remote audiences.

Shipboard Location(s):

Emergency Gen Rm No. 2 (1-125-2-E) Upper Vehicle Storage (3-41-0-A) Hanger Bay (1-80-0-A)
Troop Living (01-41-0-L) AFFF Station #5 (1-106-2-Q) Wardroom (02-41-01-L)

Desired Results / Objectives:

- Validate CN-Seamless as a viable portable cutting tool for BDA teams to utilize for space entry.
- Prove local BDAT can remote live feed via DSK using drones, FLX BOT and DTG 3.
- Evaluate data limits on DSK from multiple sources.
- Evaluate drone scan and UUV data quality vs human collected data.
- Validate TWINFRA, Schemata and Hexagon’s ability to ID battle damage accurately using digital 3D rendering of affected spaces with temporal before/after for unified situational awareness.

Companies and Technologies Involved:

Company	Technology	Role in Scenario	Integration / Interoperability Notes
Modal AI	Stinger Drone	Provide video feed	Compact design. Minimal pilot training.
Skydio	X2D drone	Provide video feed	Rugged thermal and optical sensors for inspections.
	X10 drone	Provide video feed	High resolution optical sensors for detailed imaging, ideal for precise exterior assessments.
Flyability	Elios III Drone	Provide video feed	Small caged drone to allow for safe interior flights.
FLX Solutions	FLX BOT	Video by personnel	Video using BDAR team of inaccessible areas.
CN-Seamless	Portable Cutting tool	Access cut	Provides access cut to damaged area
NESAR	Distance Support Kit	Sends data off site	Relay live feed and data offsite from various sources.
Univ of Houston	TWINFRA	Data integrator	Processes and live-streams Skydio and GoPro footage for analytics and visualization.
HEXAGON	Lecia BLK2GO	3D Scanning	Handheld 3D scanner.
SCHEMATA	Gaussian Splatting Tech	3D Scanning	AI scene understanding and 3D space reconstruction
3M	PAPR Respirator	Safety / Comms	Integrated microphone for DSK operator
Deep Trekker	DTG 3	Live feed from tank	Tethered ROV with LED lighting and 4K camera



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Pacific Battle Damage Exercise (PBDE) 2026 Piping Inspection and Repair Scenario

Scenario Title: Piping Inspection and Repair Hot Work Control Alternatives

Basic Plan:

- Conduct battle damage piping system assessments.
- Execute piping repairs utilizing hot work alternatives to include Viega, LOKRING, Parker, NOV, SUNREZ, Clarus, 3M, MAGNASEAL, Eddyfi, and ENFASCO technologies to restore systems to operational status.
- Perform hydrostatic test on repaired piping areas to document and validate each repair.

Shipboard Locations:

Emergency Generator Room No. 2 (1-125-2-E) Upper Vehicle Storage (3-41-0-A)
Troop Living (01-41-0-L) AFFF Station #5 (1-106-2-Q) Wardroom (02-41-01-L)

Desired Results / Objectives:

- Document and report findings to NAVSEA 05 in the below areas:
 - Mechanic’s evaluation for battle damage repair installation process as compared to other fittings. Evaluation to include surface prep and NDT requirements, fitting installation process (time and ease of installation), and tooling requirements (temp services and tool clearance requirements).
 - Hydro test results of each repair installation.
 - Training requirements for qualifications on tooling and fitting.
 - EMRF feasibility: Variety required, stock availability, cost, training method, tooling complexity and hazmat material restrictions.

Companies and Technologies Involved:

Company	Technology	Role in Scenario	Integration / Interoperability Notes
Viega	MegaPress and ProPress PCF	Piping Fittings	Med pressure for larger diameter CNA pipe.
LOKRING	CN-1650 and MAS 3000 MAF	Piping Fittings	High pressure Steel and CNA piping.
Parker	Phastite and FastSeal MAF	Piping Fittings	High pressure hydraulic tubing and smaller hydraulic piping.
NOV-DXPE	Bondstrand 7000 (GRE)	Piping and Fittings	Light weight. Large diameter piping. Able to connect to CNA and steel piping
SUNREZ	Fiberglass resin piping patches	Piping Patch	Repair holes. UV light cured resin patch.
3M	VHB adhesive piping patches	Piping Patch	Adhesive Tape for elevated strength or environmental resistance
MAGNASEAL	Magnet Urethane patch	Piping Patch	Low pressure for med to large steel piping
Eddyfi	Lyft Pulsed Eddy Current (PEC)	UT Piping	External and internal inspection for thickness
ENFASCO	Cold milling and cutting tool	Surface prep and pipe cutting	Prepare piping for fitting installation without hot work.
CLARUS	Fluid System Cleanliness	Flush and Hydro	



Power Generation Scenario

Basic Plan:

- The ship returns to port with no power or backup diesel generator.
- Power needs to be provided pier side and shipboard to support habitability, assessments and repairs, including welding machines, any equipment charging stations and EMRF containers.
- Confined spaces create difficulty in running power from topside traditional Internal Combustion Engines (ICEs).
- Power generation below deck presents emissions hazard for traditional ICEs.

Shipboard Location(s):

- Hangar bay and various compartments and spaces.

Desired Results / Objectives:

- Rapidly deployable power to support pier side and shipboard assessments and repair operations where traditional power sources cannot reach or support.
- Validate effectiveness of remote support technologies and use in confined spaces.
- Capture any maintenance challenges encountered with running equipment over two-week period.
- Evaluate feasibility to run low amp tools (Sawzall's/grinders/hand tools) vs larger draw items such as a welder or cold spray equipment.

Companies and Technologies Involved:

Company	Technology	Role in Scenario	Integration / Interoperability Notes
Nabors	Hydrogen & Electrical Generation System	Provide power for pier and ship repair services.	Uses solar power and distilled water to run electrolysis. The resulting hydrogen is stored safely in low-pressure hydrides that can support power supply.
Sentient	Meteor - Portable Power Generation	Provide portable, reliable, scalable power	Modules can be quickly combined to create larger systems (i.e., 240v), or distributed as smaller point-of-need systems (i.e., 110v) at distance for power to suit specific battle damage repairs
Western Global	Fuel Storage	Provide pier side fuel storage	Provide fuel for diesel generators and other fuel powered technologies.



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Ship and Personnel Safety Scenario

Basic Plan:

- Verify spaces to be used during exercise and determine locations for monitors and “command center”.
- Install remote monitors and command center.
- Perform conductivity checks to both command center and selected remote offsite locations to compare technology provider communication systems with NESAR’s Distance Support Kit.
- Evaluate performance and assess effectiveness of technology provider ability to detect unsafe air quality, particulate matter, heat and smoke.

Shipboard Location(s):

- Hanger Bay (command center) and multiple workspaces throughout the ship. Personal monitors available during work operations.

Desired Results / Objectives:

- Assess ease of setup, integration, and monitoring.
- Equipment easy to run and maintain in working order? Ruggedness? Easily networked?
- Effectiveness and accuracy of data transmission from ship command center to remote sites.
- Effectiveness of alarms (including number of false alarms) and notifications.
- Manning requirement and practicality of use during an expeditionary environment.

Companies and Technologies Involved:

Company	Technology	Role in Scenario	Integration / Interoperability Notes
BLACKSTARTECH	Robotic firewatch and thermal monitoring	Autonomous firewatch	Flame and Smoke Video Analytics Alarm and Remote Notification
STATA Technologies	Remote firewatch and thermal monitoring	Autonomous firewatch	Real-time thermal detection with automatic alerts
Consilium	Remote firewatch and thermal monitoring	Autonomous firewatch	Real-time thermal detection with automatic alerts
Industrial Scientific	Radius BZ1 Area monitor Ventis Pro5 personnel monitor	Continuous area gas monitoring	Communicates air quality readings and alarms with other units and personal gas monitors
Northeastern University	NIMOY ECSM Environmental and space monitor	Continuous gas area monitoring	Continuous atmospheric monitoring and reporting
Aeroqual	AQS1 space monitor Ranger handheld monitor	Safety & perimeter particulate monitoring	Handheld environmental monitoring
Persistent Systems	Communication integrator	Data transfer	Mobile ad hoc wi-fi network
Firelce Solutions	Fire safety products	Welding Blankets and Fire Retardant Gel	Fire safety and suppression





3M Scott Fire & Safety C420+ Powered Air Purifying Respirator (PAPR)

The Scott Safety C420 Plus PAPR is designed for use in demanding CBRN environments that require a dependable, powered air-purifying respirator. The PAPR blower is EMI shielded to Mil-STD 461C and will not interfere with radio communications. It is protected from water and dust damage and can be easily decontaminated. The C420 Plus PAPR is ideal for fire departments, law enforcement agencies and federal first responders who require non-IDLH respiratory protection over an extended period of time. The Powered Air Purifying Respirator (PAPR) is a blower assisted air purifying respirator. It is designed for individuals working in industrial, first responder and law enforcement environments that are considered not Immediately Dangerous to Life and Health (non-IDLH), including atmospheres containing not less than 19.5% oxygen. Ambient air is drawn through two (2) canisters where airborne contaminants are captured by particulate filter and/or sorbent bed. The cleaned air is sent from the PAPR to the user through a breathing tube that is connected to the user's facepiece.

Key Applications

The C420+ PAPR can be used in non IDLH environments that have been compromised environments that may contain contaminants. The C420+ would be ideal for the following applications aboard USN vessels:

1. Battle Damage Survey
2. Protection against grinding and welding off gases
3. Command & Control Personnel during prolonged CBRN operations
4. Respiratory protection during exothermic torch cutting operations
5. Tank and Void Inspection & Repair (once deemed non IDLH)
6. Shipyard applications



C420+ PAPR

For the Pacific Battle Damage Exercise, the NAVSEA 05T NESAR (Navy Expeditionary Sustainment and Repair) team will utilize the 3M Scott Safety C420 Plus PAPR to allow for safe respiratory protection during actual battle damage grinding and welding repairs by multiple vendors. NESAR plans to evaluate this safety equipment during multiple test scenarios to determine if it should be considered with future shipboard battle damage support technology and positioned in various parts of the world to increase the Navy's ability to maintain deployed assets throughout assigned missions.



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3M VHB Tape High-Strength Bonding for Demanding Applications Reliable, Long-Term Performance



3M VHB Tape provides a proven, durable bonding solution for industrial, transportation, electronics, and construction applications. This acrylic-foam tape technology delivers strong, permanent bonds that replace mechanical fasteners in a wide range of assemblies. Its viscoelastic properties distribute stress, absorb vibration, and maintain bond integrity under challenging conditions. For many maintenance, repair, and assembly scenarios, 3M VHB Tape enables clean, fast, and consistent joining without the sparks, noise, or debris associated with mechanical fastening or welding. This makes it suitable for workspaces with strict safety controls or limited access for traditional tools.

Key Benefits: High-strength bonding suitable for metals, composites, glass, and many plastics. No mechanical fasteners, drilling, or welding are required. Helps reduce noise, vibration, and stress concentrations. Creates clean bond lines with no curing time. Excellent durability in outdoor and industrial environments. Supports streamlined assembly and rework processes.

Potential use cases:

- Use on damaged or a compromised section of a bulkhead that requires a lightweight temporary or semi-permanent patch, or the installation of sensors, plates, or protective shielding, without disturbing adjacent systems.
- Use on a section of piping that requires reinforcement, bracket attachment, or installation of a protective patch in a location where hot work authorization is limited or unavailable.
- Used for non-critical non-shock qualified mounting applications.

For the Pacific Battle Damage Exercise, the NAVSEA 05Ts **NESAR** (Navy Expeditionary Sustainment and Repair) team has developed specific evaluation and repair scenarios for the technology, allowing NAVSEA to test for potential expanded shipboard use.

3M technology will undergo piping and bulkhead repair scenario testing to demonstrate and assess its ability to bond to various materials and provide high structural integrity for rehabilitating pipe and repairing bulkheads.

NESAR plans to evaluate this product in comparison to other composite technologies to determine if it should be added to future shipboard battle damage repair lockers and pier side expeditionary repair containers that can be positioned in various parts of the world to increase the navy's ability to maintain deployed assets throughout assigned missions.



3M Points of Contact:



Andrej Staré Navy Business Development,
Manager
Government Markets
Mobile: 571-597-8997

Mike D'Andrea Global Business Development
Manager
Industrial Adhesives & Tapes Division
Mobile: +1 715 629 0982

Safety & Perimeter Particulate Monitoring

Real-Time, Near Reference particulate measurement and data platform for accurate and actionable insights

Full integration



Dust Sentry
Particulate:
PM1; 2.5, 4, 10, TSP



Ranger
Particulate:
PM1; 2.5, 4, 10, TSP



Continuous, real-time monitoring with Alerts

For the Pacific Battle Damage Exercise, the NAVSEA 05T **NESAR** (Navy Expeditionary Sustainment and Repair) team will utilize Aeroqual continuous and on demand particulate monitoring equipment to assist other Battle Damage Assessment and Repair (BDAR) technologies in the execution of the scenarios to ensure satisfactory space ventilation and exhaust services during BDAR response. This capability will complement **NESAR's** other space monitoring initiatives to improve personnel safety.

NESAR plans to evaluate this product by utilizing the mobile ad hoc network (MANET) from Persistent Systems in comparison to other remote monitoring systems to support implementation of this technology into the waterfront maintenance community. **NESAR** believes this capability would be a good addition to current Ships Force damage control lockers as well as maintenance provider's temporary service portfolio.



Real-time
air quality
monitoring solutions





FIRESIGHT®
Robotic Fire Watch Series

BLACKSTARTECH
A Division of Studsvik



Automate Hot Work and Degraded Fire Zone Monitoring

Proprietary Triple IR Flame and Smoke Video Analytic Detection

- Onboard UL Fire Panel Alarm and Remote Notification Solutions
- FM Global Approved with integrated battery backup operation
- Optional Thermal Camera for up-close Hot-Work and Temp Monitoring

Remote Wi-Fi or BlackStarTech Private LTE Broadband Interconnection

For the Pacific Battle Damage Exercise, the NAVSEA 05T **NESAR** (Navy Expeditionary Sustainment and Repair) team will utilize BlackStarTech remote firewatch capability to assist other Battle Damage Assessment and Repair (BDAR) technologies in the execution of the scenarios as gas free engineers and firewatch personnel may not be on site during actual BDAR response. Combining FIRESIGHT with other monitoring technologies will reduce safety risks.

The BlackStarTech FireSight® Robotic Fire Watch Series is a deployable, independent fire watch detection system that protects an area from emergent fire damage that can result from hot work and/or incendiary fires. FireSight monitors flammable and explosive hazards in fire susceptible and hot work areas as well as augments existing fire protection protocol. When FireSight detects an event, it activates the onboard horn and strobe for local area warning. It immediately notifies remote personnel or first responders via an internal NFPA-compliant alarm panel and associated fault dry contact relays. The relay contacts can be connected to existing building fire alarm panels or other comparable facility alarm systems to actuate and enhance remote detection capabilities.

NESAR plans to evaluate this product by utilizing the mobile ad hoc network (MANET) from Persistent Systems in comparison to other remote monitoring systems to support implementation of this technology into the waterfront maintenance community.



For more information, scan the QR code or contact us at info@blackstartech.com



BLUEYE UNDERWATER ROVS

YOUR EYES BELOW THE SURFACE

Professional underwater ROVs designed, developed, produced, and serviced in Norway. Reliable and user-friendly underwater technology for frictionless access to what's below the surface.

Blueye has its roots in the highly renowned Centre for Autonomous Marine Operations and Systems (AMOS) at Norwegian University of Science and Technology (NTNU) in Norway. Exceptional ease of use and robustness have been the overarching design goals since the beginning. Drawing on competence from world-leading marine engineers, seasoned software developers and award-winning industrial-, mechanics- and electronics designers, we have created what we strongly believe are the world's best underwater drones.



The Blueye X3 is a professional-grade underwater drone built for detailed inspections and challenging underwater operations. Fast shipping from Norway.

- HD Tilt Camera Tilt
- 256 GB Storage
- Powerful LED Lights
- Thin Tether
- Up to 5-hour battery

Key Features

- Automatic Heading and Depth
- 3X Guest Ports
- Below 20 lbs.
- Wireless controller
- 3 Knots Forward Speed
- 1000 Ft Depth Rating
- Live stream to Teams

For the Pacific Battle Damage Exercise, the NAVSEA 05T NESAR (Navy Expeditionary Sustainment and Repair) team will use the BLUEYE ROV technology to inspect the externals of a damaged hull or steering area to demonstrate the equipment's versatility and internal NDT capability.

NESAR plans to evaluate this equipment to determine if it should be considered with future shipboard battle damage support technology and positioned in various parts of the world to increase the Navy's ability to maintain deployed assets throughout assigned missions.





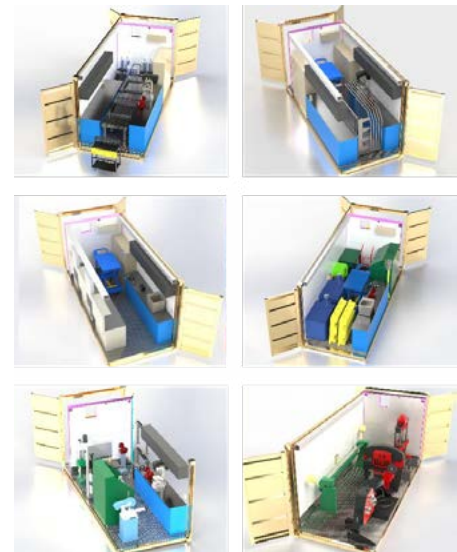
Fluid Solutions:

- Remediation and contamination control services.
- Custom manufacturing services.
- We specialize in fast-response worldwide services.
- Water removal from oil systems.
- Varnish removal
- High-velocity flushing.
- Cleaning of hydraulic, lube-oil and mission-critical systems, habitability, cooling and air systems.
- US Navy contractor since 2001 serving on all vessel classes.

For the Pacific Battle Damage Exercise, the NAVSEA 05T NESAR (Navy Expeditionary Sustainment and Repair) team has not developed a specific assessment and repair scenario for this technology; however, we will be utilizing their capability to accomplish testing and evaluation for all the piping repair technologies used in the event.

Clarus has a reputation as the gold standard for fluid system expeditionary restoration and will provide pre-detonation fabrication and installation recommendations for the piping spool pieces that enable them to be segregated, pressurized and contained until the start of the kinetic phase. Following the battle damage repair phase of the exercise, Clarus will hydrostatically test all the fittings used during this event to document their performance through normal hydro pressures and up to destruction. They will provide a detailed report on the fitting's failure containing failure pressure and failure mode.

NESAR will utilize Clarus as an advisor for the design of expeditionary containers which will be positioned in various parts of the world to increase the navy's ability to maintain deployed assets throughout assigned missions.





MACH 1

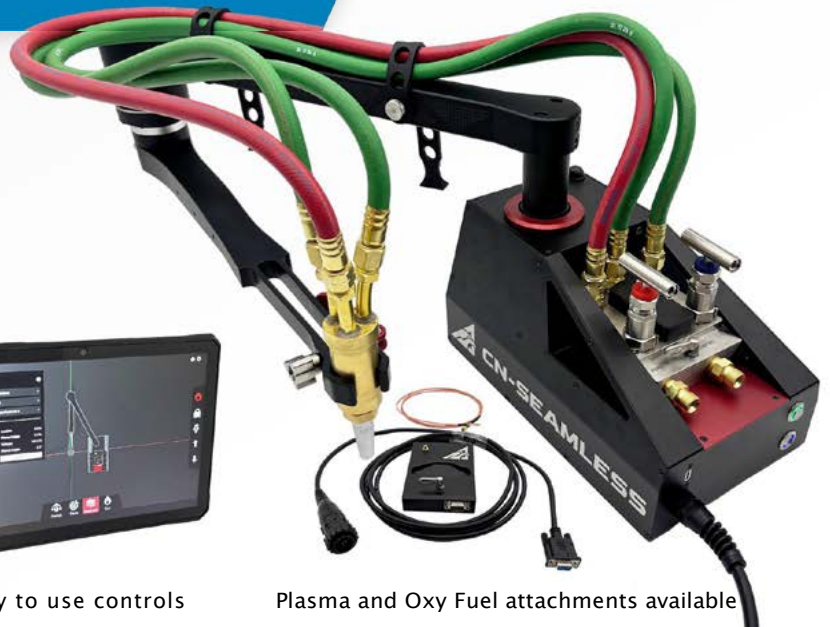


EASY-TO-USE PORTABLE CNC SHAPE CUTTING

- On-the-fly fabrication of padeyes, lifting lugs, wedges, and tools
- Quick deck penetrations and hull access cuts
- Point-to-point tracing of critical components
- Confined-space automated cutting
- Bulkhead modifications
- Battle damage repair

SPECS

- Base machine weight: **20 lbs**
- 68"** working area diameter
- 2.25"** vertical adjustment
- Cuts up to **12"** thick steel



Transports in a rolling case



Easy to use controls

Plasma and Oxy Fuel attachments available

For the Pacific Battle Damage Exercise, the NAVSEA 05T NESAR (Navy Expeditionary Sustainment and Repair) team has not developed a specific scenario for this technology, however we will utilize their capability (CNC cutting) to assist other technologies in battle damage assessments and repairs.

The CN-Seamless MACH 1 is an affordable, ergonomic, ruggedized, highly portable, precision controlled, all-inclusive automated product. This technology has interchangeable industrial attachments for oxy-fuel cutting and plasma cutting. Future development of the modular platform will add end effectors for arc gouging, bevel cutting, mag drilling, laser engraving, mechanical probing, laser scanning, digital camera scanning, MIG welding, waterjet cutting, oxy-fuel lancing, plasma cleaning, laser cleaning, laser cutting, paint marking, and chalk marking, and more.

NESAR plans to evaluate this technology during this exercise to determine if it should be included with future shipboard battle damage support technology and positioned in various parts of the world to increase the navy's ability to maintain deployed assets throughout assigned missions.

Composite Automation, LLC

Innovative Composites Manufacturing Solutions

Glass UV Prepreg: Emergency Repair of Ship Hull Penetrations

UV Prepreg for emergency repair

- Simplifies storage
- Rapid < 60 minutes repair time
- Repeatable structural performance
- Co-Pilot guides Navy personnel through repair process



For the Pacific Battle Damage Exercise (PBDE 26), the **NAVSEA 05T's NESAR** (Navy Expeditionary Sustainment and Repair) team has developed specific evaluation and repair scenarios, pre-detonation and post-detonation for damaged structure temporary repair, allowing NAVSEA to test for potential expanded use during remote repair evolutions.

Composite Automation (CA) uses a different areal weight, orientation and lamination scheme with a UV curable **resin** that cures within 60 minutes. CA concept uses prepackaged plies that have predefined properties that allow for rapid application, with use of computer algorithm, **Co-Pilot**. With the prepackaging that CA uses, the repair solution is applicable to more flat, curved, or corner configurations such as hull or bulkhead damage. Currently the UV **prepreg fiber** is for application to small damaged areas (approx. 2 sq feet).

NESAR plans continued use of this technology applications expanding its capabilities and functions for use in battle damage occurrences and ship maintenance needs as a proven technology.

sales@compositesautomationllc.com

302-831-8898

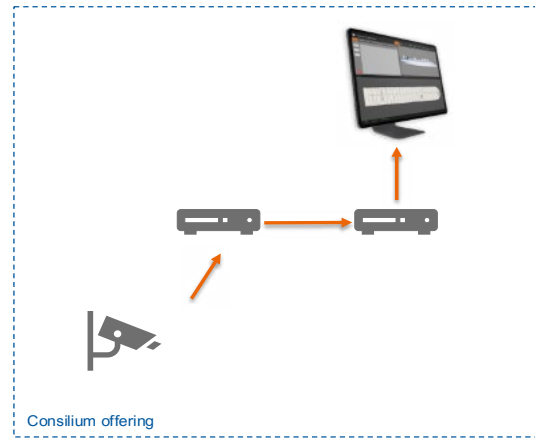




Consilium SensEye

AI Camera technology and SMiG's safety management system to create a collaborative system that gives you more time when you need it the most.

Our AI-powered smart camera does the watching for you — detecting threats, fire risks, and safety issues as they happen. Monitor vast areas in real-time, across multiple cameras, with unmatched accuracy and zero fatigue.



DETECTS DANGER IN SECONDS

SensEye utilizes traditional CCTV to create an intelligent safety tool that helps predict and prevent incidents before they escalate.

FASTER ACTION WITHOUT PHYSICAL CHECKS

View the situation instantly in SMiG, without having to send personnel to verify the situation – reducing response time in critical situations.

ACTIONABLE INSIGHTS IN REAL TIME

Your crew can act faster and more decisively, backed by the certainty of dual-verified detection.

ACCURACY THAT BUILDS TRUST

AI validation through camera analytics helps confirm or dismiss alarms instantly, reducing unnecessary disruptions.

SENSEYE OFFERING

Fire Detection

- Smoke detection
- Flame detection
- Thermal Abnormality

Sensor-triggered live view: Utilize cameras for quicker response to existing sensors

Operational efficiency: Streamline workflows and cut manual checks

- IP Camera Support: Works with any IP cameras; 1080p HD recommended.
- No Added Bandwidth Load: Utilizes existing CCTV video streams.
- Scalability: Additional cameras can be added as needed.
- Server Setup: One Smart Camera Server required. Should be installed near CCTV system.

For the Pacific Battle Damage Exercise, the NAVSEA 05T NESAR (Navy Expeditionary Sustainment and Repair) team will utilize Consilium remote firewatch capability to assist other Battle Damage Assessment and Repair (BDAR) technologies in the execution of the scenarios as firewatch personnel may not be on site during actual BDAR response. Combining Consilium equipment with other monitoring technologies will reduce safety risks.

The Consilium system delivers real-time thermal monitoring for hot work and high-risk sites. The SensEye utilizes CCTV and AI to create an intelligent safety tool that helps predict and prevent incidents before they escalate. AI validation through camera analysis helps confirm or dismiss alarms instantly, reducing unnecessary disruptions.

NESAR plans to evaluate this product in comparison to other remote monitoring systems to support implementation of this technology into the waterfront maintenance community.





ACRS

Agile Cable Repair System

DIT-MCO International
 5612 BRIGHTON TERRACE
 KANSAS CITY, MO 64130-4530
 (800) 821-3487
 (816) 444-9700
 Fax (816) 444-9737
 www.ditmco.com



Agile Cable Repair System (ACRS) User Manual
 Pelican Case - 1630 Waterproof Transport Case
 2 First Tactical Tactix Backpack
 2 HT-128 B Handheld, 915Mhz INLINE
 MIL-SPEC Li-Polymer Batteries and Charger
 HT-128 Pigtail Adapter Cable
 MIL-SPEC 16-26 AWG Daniels Custom Stripmaster Tool
 MIL-SPEC 10-14 AWG Daniels Custom Stripmaster Tool
 MIL-SPEC General Purpose Crimp Tool for Environmental Splices
 7 Compartment Small Parts Organizer

Wire Marking Decal Set
 48 8" Cable Ties
 Utility Knife
 Rechargeable Magnetic Flashlight
 3 ft, 128 Wire Daisy Chain Cable
 6 ft, 128 Wire Daisy Chain Cable
 9 ft, 128 Wire Daisy Chain Cable
 12 ft, 128 Wire Daisy Chain Cable
 20 ft, 128 Wire Daisy Chain Cable

For the Pacific Battle Damage Exercise, the NAVSEA 05T **NESAR** (Navy Expeditionary Sustainment and Repair) team has developed a specific assessment and repair scenario for this technology. A bundle of cables will be cut, and this kit will identify the correct cable mate and repair or splice in new wires for unrestricted operation.

As the capabilities of this technology were validated during **NESAR's** REPTX 24 SALV-EX exercise, this exercise will primarily be used to train attendees and receive additional input from the repair and maintenance community. **NESAR** recommends that this device be added to future shipboard battle damage lockers.



Bring the solution to the problem



NAVSEA 05T DISTANCE SUPPORT KIT (DSK)

- **Independent Network**
Does not rely on local infrastructure – works in the middle of the ocean
- **Resilient Communications**
Long-range, reliable communications in difficult environments where traditional methods like 5G or Wi-Fi fail
- **Portable**
Modular cases allow one-person transport for global deployment
- **Simple**
Familiar tablet hardware and a web-based connection, integrated with DoD-approved Microsoft Teams

DSK serves in multiple capacities. Aboard the ship, it provides crucial backhaul communications to mainland and CONUS commands, facilitating situational reports (SITREPs), particularly during the kinetic phase. Teams aboard the USS Peleliu will have an instant connection to critical communications, while off-site teams will receive real-time progress and remediation updates through interactive video and audio. Throughout the exercise, the DSK will be on-site to connect with technology developers and manufacturers for immediate training and communication, ensuring the successful completion of repairs. Further SITREPs will be conducted to keep off-site personnel and officials informed of repair and exercise progress.



LYFT® CORROSION ASSESSMENT: NAVAL APPLICATIONS

By Lloyd Graham, Product &
Applications Expert
lgraham@eddyfi.com



WHAT IS PEC?

Electromagnetic inspection technology to detect wall loss due to corrosion in ferromagnetic materials.

Inspect through various non-conductive coverings:

- Insulation covered with aluminum, stainless or galvanized steel weather jackets
- Floor coverings, concrete, composite wraps, coatings, etc.
- External corrosion product (scab, blisters, etc.)
- Marine growth
- Also referred to as liftoff (LO) throughout presentation

Listed in industry standards:

- ASME BPVC
- ISO 20669
- API RP 583



For the Pacific Battle Damage Exercise, the NAVSEA 05T NESAR (Navy Expeditionary Sustainment and Repair) team has developed specific evaluation and repair scenarios for the technology, allowing NAVSEA to test for potential expanded shipboard use.

Eddyfi Lyft PEC technology will be used to inspect small ($\geq 1''$) and large (6'' to 8'') corroded pipes (both internally and externally) as well as performing inspections of decking coated with non-skid to determine the extent of any corrosion.

Pulsed Eddy Current (PEC) is an electromagnetic inspection technique used to detect wall loss on ferromagnetic structures such as carbon steel and cast iron. It provides a relative volumetric measurement converted into an average thickness measurement based on the calibration area. Lyft is a state-of-the-art high-performance PEC system offering an easy to deploy solution. It is quick and simple to set up. There is no surface preparation needed including coating/insulation removal. The inspection can be performed while the asset is in-service even if the temperature in contact is up to 120° C (250° F).

NESAR plans to evaluate this equipment to determine if it should be added to future shipboard battle damage repair lockers and EMRF containers that can be positioned in various parts of the world to increase the navy's ability to maintain deployed assets throughout assigned missions.



For technical support requests, please contact support@eddyfi.com



ADVANCED ULTRASONIC PHASED ARRAY TECHNOLOGY For Ships & Submarines using the Cypher



What Is Ultrasonic Phased Array (UTPA)?

Ultrasonic Phased Array uses multiple electronically controlled ultrasonic elements to steer and focus sound waves, enabling fast, high-resolution inspection of ship structures without disassembly or damage.

Key Applications

Structural Inspection & Integrity:

- Detects cracks, voids, and internal defects.
- Inspects welds in hulls, bulkheads, and frames.
- Identifies early signs of fatigue and stress.

Hull & Underwater Component Assessment:

- Measures hull thickness and corrosion.
- Inspects rudders, shafts, and underwater fittings.
- Supports dry dock and scheduled maintenance programs.

Pipe, Tank & Pressure System Inspection:

- Evaluates fuel, steam, and hydraulic systems.
- Detects corrosion, erosion, and wall thinning.
- Helps prevent leaks and system failures.

Non-Destructive Testing (NDT):

- Inspects metal and composite materials with no damage.
- Verifies repair quality and new installations.
- Complements radiographic and magnetic particle testing.

Operational Benefits:

- High-resolution imaging
- Faster inspection times
- Improved safety
- Reduced maintenance downtime
- Enhanced fleet readiness



REMOTE WELD SCANNING



CYPHER: PORTABLE PAUT INFO

Supporting a Ready & Resilient Fleet

UTPA technology strengthens the structural health, safety, and mission readiness of ships and submarines—ensuring reliability in every operating environment.

For the Pacific Battle Damage Exercise, the NAVSEA 05T NESAR (Navy Expeditionary Sustainment and Repair) team has not developed a specific evaluation and repair scenarios for Cypher UTPA technology.

Cypher Ultrasonic Phased Array technology can be used to inspect welds or surfaces for integrity or determine the extent of defects. Cypher Ultrasonic Phased Array is portable inspection unit that is fast to set-up and designed to operate under various weather or industrial environmental conditions. The inspection results have reduced noise with high resolution imaging to find small defects.

NESAR plans to evaluate this equipment to determine if it should be considered with future shipboard battle damage support technology and positioned in various parts of the world to increase the Navy's ability to maintain deployed assets throughout assigned missions.



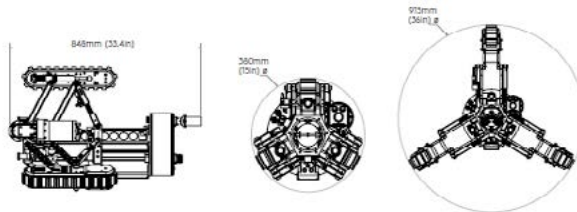
For technical support requests, please contact support@eddyfi.com



VersaTrax™ Y-Series Inspection Crawler



VT-Y380



VersaTrax™ can perform difficult internal inspections over a wide range of pipe sizes in virtually any orientation. This tethered pipe crawler can travel up to 3,300ft in a single run. The unique three-tracked design allows vertical travel, and even through multiple bends. The crawler can carry a variety of sensors or tooling to support inspection or troubleshooting.



VersaTrax™ is equipped with LED lighting to support the available cameras ranging in full PAN, Tilt and Zoom (PTZ) to the full PT Spectrum. The equipment's unique tracks offer pulling force to pull a payload through bends. An optional front rotating tooling arm is ideal for positioning tools or sensors precisely on the pipe's circumference. VersaTrax™ utilizes Eddyfi Technologies ICON™ software which includes crawler operation, project tagging and annotation, video recording, sensor data recording, plugins providing automation, and more.

SPECIFICATIONS

DESCRIPTION	VT-Y200	VT-Y380
Pipe opening range	200mm (8in) - 400mm (16in)	380 (15in) - 915mm (36in)
Maximum tether length	300m (1000ft)	1000m (3300ft)
Maximum Speed	3.6m (12ft) per minute	6.4m (21ft) per minute
Vehicle weight	8.5kg (19lb)	46kg (102lb)



For the Pacific Battle Damage Exercise, the NAVSEA 05T NESAR (Navy Expeditionary Sustainment and Repair) team will use the EddyFi VersaTrax™ technology to inspect the internals of a damaged or cut pipe to demonstrate the equipment's versatility and internal NDT capability.

NESAR plans to evaluate this equipment to determine if it should be considered with future shipboard battle damage support technology and positioned in various parts of the world to increase the Navy's ability to maintain deployed assets throughout assigned missions.

GET THE **FIRE** OUT OF THE SHIP MAINTENANCE

ENFASCO Cold Milling Surface Preparation Technology

- Non-Sparking, Non-Static Producing
- No Fire Watch Required
- No Hot Work Controls
- Weighs under 7 pounds
- Proprietary Carbide Composite wheel
- Noise level less than 85dBA



1000-HR SERVICE LIFE
AVERAGE PER WHEEL



For the Pacific Battle Damage Exercise, NAVSEA 05T's **NESAR** (Navy Expeditionary Sustainment and Repair) team has not developed a specific assessment and repair scenario for this technology; however, we will be utilizing this unique capability to accomplish non-sparking surface preparation evolutions for various assessment and repair scenarios. Unlike other grinding and cutting tools, this capability has been proven to be used without fear of creating a spark which could introduce a fire safety risk to the repair site. This tool can also be used for application of adhesive mounted studs and removal of excessive weld splatter, cold spray application or corrosion.

This tool includes a Chicago style quick disconnect fitting and is designed to operate from a supply from a 90 psi (minimum) 3/8" air supply hose. The speed limitations designed into this pneumatic tool allow use without having to require hot work controls which limit use case applicability; however, this tool may be the best option for specific cases (i.e.. small prep areas, other competing work in space, increased fire risk already in space). **NESAR** recommends that this device be added to future shipboard battle damage lockers.

sales@enfasco.com

866-363-2726



Adhesive Mounted Studs and Tie Downs for the Deck Plate



- Emergent Repairs and Sustainment at Sea without HOT WORK and GAS-FREEING tanks
- Rapid Response Solutions installed by Shipsforce
- Can be used as a temporary or permanent solution

- Secure Ammo Lockers
- Secure Emergency Berthing during a casualty event
- Secure HEPA filters in quarantine space during a biological event
- Secure medical berthing and chair tie downs

For the Pacific Battle Damage Exercise, NAVSEA 05T **NESAR** (Navy Expeditionary Sustainment and Repair) team developed a specific assessment and repair scenario for this technology as the ENFASCO Click Bond Studs will be used in conjunction with the SWRMC shoring patch. Additionally, these studs can be used to support other scenarios if needed to attach items to structure, bulkheads, or equipment.

The ENFASCO studs are already approved for use by NAVSEA (NAVSEA Dwg 803-8436636). **NESAR** recommends that these studs be added to future shipboard battle damage support technology which can be positioned in various parts of the world to increase the Navy's ability to maintain deployed assets throughout assigned missions.



Firelce XT 20 oz. Aerosol Spray



Cost Efficient, Safe Personal Fire Protection for Immediate Intervention



**HHA
Tested/Navy
Approved
Agent**



In a structural fire, should ships force be using an agent that is safe for use around people, plants and pets OR one that requires SCBA?

Suppresses approximately 64 square feet of fire at temperatures up to 5000 degrees F

Intuitive handling with foolproof single "handle-direction" orientation

Designed to coat, cool, and contain heat-related events quickly and efficiently

Effective on exotic metals including magnesium, lithium and titanium

Cleans with water

Passed custom UL711-40A listing equivalent testing and is compliant with DOT 2Q DSCM5749

Eco-Friendly, non-toxic, non-corrosive

For use on virtually any surface

Slim, lightweight profile can be stored anywhere or worn by ships force with the available holster



See the Firelce XT 20 oz Aerosol in action



SCAN ME

Maintaining a ready and capable fleet is paramount to national security yet increasingly challenged by the growing complexity of modern naval warfare and the vast distances inherent in maritime operations. Ship repair in contested maritime environments is hampered by the lack of abundant firefighting resources. In these situations, response time is critical to ensure safe shipboard repairs. For the Pacific Battle Damage Exercise, the NAVSEA 05T NESAR (Navy Expeditionary Sustainment and Repair) team will demonstrate the advantages of Firelce's expanded firefighting capacity. NESAR plans to outfit their Expeditionary Maintenance and Repair Facility (EMRF) deployable system comprised of ISO-standard containers, each housing a specialized suite of maintenance and repair capabilities. Deployable afloat or ashore, EMRF supports Theater Combatant Commanders and increased operational tempo, delivering comprehensive repair capacity for Hull Mechanical and Electrical (HM&E) and combat systems in robust and austere environments. NESAR will also socialize the advantages of this product for possible use through the entire NAVSEA waterfront community.



Firelce Lithium Battery Suppression Locker

A Customized Storage Solution for Battery Storage Needs Large and Small

Lithium-ion battery technology, once a novelty, is now omnipresent. Li-ion batteries are more resilient to damage, can cycle more times without significant loss of capacity and have a higher energy density than traditional batteries. However, these advantages carry significant risks. Failure of a single Li-ion battery can generate dangerously high heat, initiate thermal runaway, and produce toxic, flammable gases that pose a serious inhalation danger that is especially hazardous in confined space environments. The proliferation of Li-ion batteries demands effective solutions to safe storage.

The Firelce Lithium Battery Suppression system is a simple, and effective way to disburse a Navy approved agent to the battery storage module affected by high temperature. Firelce ST rapidly cools the affected batteries below ignition temperature and suppresses any fire thereby preventing runaway, reignition, and extension to adjacent batteries. It is designed to accommodate the limited space available in shipping containers and on vessels.

The customizable locker system contains a pressurized tank of Firelce ST and a configuration of tubing, connecting the modules in series with a fusible plug or heat detector in each module.

The fusible plug/heat detector is a temperature above the normal operating temperature of the module with a modest buffer to prevent false dispersion. When the fusible plug/heat detector melts, the pressure in the tubing is released which opens a valve that deploys agent only to the affected module.

<https://www.youtube.com/watch?v=o4RBZenL4FE>



SCAN ME



Maintaining a ready and capable fleet is paramount to national security yet increasingly challenged by the growing complexity of modern naval warfare and the vast distances inherent in maritime operations. Ship repair in contested maritime environments is hampered by the lack of forward maintenance facilities. This critical gap forces vessels needing significant maintenance or repair to return to distant maintenance depots and suspend forward presence for extended periods. Responding to this challenge, the NAVSEA 05T NESAR (Navy Expeditionary Sustainment and Repair) team is pioneering a transformative approach to naval sustainment: the Expeditionary Maintenance and Repair Facility (EMRF). EMRF is a rapidly deployable system comprised of ISO-standard containers, each housing a specialized suite of maintenance and repair capabilities that sit side-by-side or stacked and are connected by power cables of a unified power distribution system. Deployable afloat or ashore, EMRF supports Theater Combatant Commanders and increased operational tempo, delivering comprehensive repair capacity for Hull Mechanical and Electrical (HM&E) and combat systems in robust and austere environments. This isn't simply about deploying containers; it's about delivering a comprehensive, self-sufficient maintenance solution to the fleet, capable of performing intermediate-level (I-Level) repairs. NESAR is working with Firelce Solutions to design and test a lithium battery storage locker prototype to add to NESAR's EMRF portfolio that may also be a solution across the NAVSEA waterfront community.



Firelce Shield Spray



Helps Stop Fire Before it Starts



The ONLY Navy Compliant FRG

Fire Retardant Gel

The Essential Assistant Tool for Hot Work Jobs Large and Small



Firelce Shield Welding Highlights

Firelce Shield Spray Demo



SCAN ME



Videos

*Instantly cools
Capable of withstanding temperatures over 5000 F*

Has excellent adhesion including on vertical surfaces

Exceptionally effective in confined spaces

Eco-Friendly, non-toxic, non-corrosive agent capatable with marine environment

Reduces risk of accidental charring, burning, or igniting of flammable material

Long shelf life ideal for lengthy deployments

Provides a lasting and protective layer to protect adjacent surfaces

Prevents heat transfer

Maintaining a ready and capable fleet is paramount to national security yet increasingly challenged by the growing complexity of modern naval warfare and the vast distances inherent in maritime operations. Emergent welding repairs have an inherent risk of damaging equipment and systems that cannot be temporarily deenergized and/or removed until all hot work repairs are complete. Firelce fire retardant gel products have been approved for use by NAVSEA and provide superior protection in these cases. The NAVSEA 05T NESAR (Navy Expeditionary Sustainment and Repair) team will demonstrate the advantages of Firelce Shield Welding Blankets and Firelce Shield Spray during PBDE hot work repairs. The NESAR team plans to outfit their Expeditionary Maintenance and Repair Facility (EMRF) deployable system comprised of ISO-standard containers with these capabilities. NESAR will also socialize the advantages of these products for use throughout the entire NAVSEA waterfront community.

Firelce Shield Welding Blanket



***Hot Work Fire Prevention
Is A Navy Imperative***



**The ONLY
Navy
Compliant
FRG**

**Fire Retardant Gel
Third Party Tested
to ANSI/FM 4950**



**Traditional Single Use Fire
Cloth Versus Firelce Shield
Welding Blanket**



***Firelce Welding
Blanket Efficacy***

***Long shelf life
Prevents heat transfer
Instantly cools***

***Capable of withstanding
temperatures over 5000 F***

***Exceptionally
effective in confined
spaces***

***Cost-effective and
reliably reusable***

***Prevents fires caused by
falling slag and errant
sparks***

***Eco-Friendly, non-
toxic, non-corrosive***

***Provides a lasting and
protective layer
on any medium to
protect adjacent
surfaces***



SCAN ME



Videos

Maintaining a ready and capable fleet is paramount to national security yet increasingly challenged by the growing complexity of modern naval warfare and the vast distances inherent in maritime operations. Emergent welding repairs have an inherent risk of damaging equipment and systems that cannot be temporarily deenergized and/or removed until all hot work repairs are complete. Firelce fire retardant gel products have been approved for use by NAVSEA and provide superior protection in these cases. The NAVSEA O5T NESAR (Navy Expeditionary Sustainment and Repair) team will demonstrate the advantages of Firelce Shield Welding Blankets and Firelce Shield Spray during PBDE hot work repairs. The NESAR team plans to outfit their Expeditionary Maintenance and Repair Facility (EMRF) deployable system comprised of ISO-standard containers with these capabilities. NESAR will also socialize the advantages of these products for use throughout the entire NAVSEA waterfront community.



FLX BOT: Intelligent Robot for Tight Space Inspections & Maintenance

Reaching the "last meter" for inspections & maintenance can be time-consuming, unsafe, or require costly dismantling of equipment

The solution is FLX BOT: a patented, handheld, articulating snake-like robot

- Navigates complex, confined spaces without disrupting operations or hazards
- High-resolution visual inspections with real-time data for faster decision-making, distance support, availabilities preparation, and advanced work package development
- Non-destructive testing and measurements in inaccessible, hard-to-reach areas and confined spaces
- 90% time & cost savings in Navy pilots + multiple days of scaffolding saved at Navy shipbuilder



Scan QR Code for Demo



REVOLUTIONIZING MARITIME, DEFENSE, CONSTRUCTION, ENERGY, & TRANSIT
MAINTENANCE WITH ADVANCED ROBOTICS

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For the Pacific Battle Damage Exercise, the NAVSEA 05T NESAR (Navy Expeditionary Sustainment and Repair) team will utilize FLX BOT's unique capability to assist other Battle Damage Assessment and Repair (BDAR) technologies that execute scenarios ranging from initial space entry assessments to vital system repairs. FLX BOT will play a major role in returning the damaged ship back to operational status.

FLX BOT is a 1" diameter, snake-like robotic system, that is operated through a human interface to allow personnel to reach battle damaged areas that are hard to access and/or dangerous environments, such as confined spaces or heights. It can be handheld or mounted on an extension pole giving personnel the ability to inspect areas typically out of reach without using staging or removing interferences. NESAR plans to evaluate several end effectors (connected with interchangeable heads) that allow FLX BOT to perform real-time inspection and maintenance tasks in areas that human technicians cannot safely access.

NESAR recommends that this device be added to future shipboard battle damage support technology which can be positioned in various parts of the world to increase the Navy's ability to maintain deployed assets throughout assigned missions.

THE MARKET-LEADING INDOOR DRONE FOR INSPECTION AND MAPPING

Elios 3



Improved safety
Keep workers from dangerous conditions using remote surveying and inspection capabilities.

Reliable Data
Get highly accurate data in the most confined spaces and provide fast operational insights.

Unprecedented Access
Complete surveying and inspection tasks in areas that are unsafe or inaccessible to humans.

Cost Efficiency
Maximize uptimes and save on equipment and labor costs with remote data collection by drone.

Insights beyond human reach

 FLYABILITY

For the Pacific Battle Damage Exercise, the NAVSEA 05T NESAR (Navy Expeditionary Sustainment and Repair) team has developed a scenario that demonstrates how this technology can support initial entry into battle-damaged areas. The goal is to provide local and remote subject-matter experts with a visual assessment of the environment without placing personnel at risk.

Visualization is one of NESAR's four primary focus areas, as the Navy requires more dynamic inspection methods that allow a ship to better understand its own condition and its surroundings, both above and below the waterline. Drones offer the capability to assess configuration changes and conduct internal and external inspections in areas that are unsafe or inaccessible to personnel.

The ELIOS 3 system provides the Navy with an autonomous drone capable of inspecting locations that are typically out of reach or hazardous. The drone is designed for GPS denied environments including confined spaces, voids, and tanks. During this exercise, NESAR plans to employ this system and integrate it with 3D scanning technology to enhance situational awareness and accelerate decisions related to battle damage repair and resource allocation. This integration ultimately aims to improve mission effectiveness and readiness under real-world conditions.



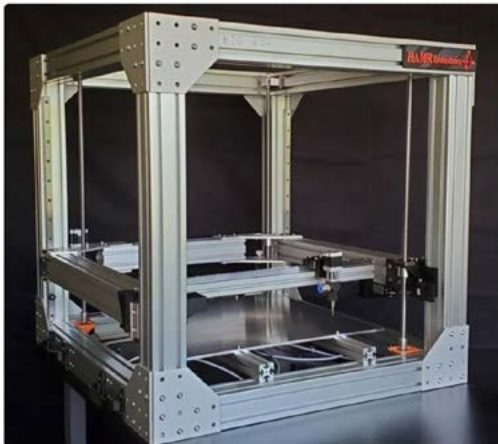
COLD SPRAY ADDITIVE MANUFACTURING



HAMR Industries has acquired a WarpSPEE3D cold Spray additive manufacturing (CSAM) system, capable of large format prints using a variety of metal and composite systems.

Capabilities include:

- High pressure cold spray
- Numerous metal and alloys of Al, Cu, Fe, Ni (Inconels), Ti, Nb, and more
- Oxide, carbide, boride, and nitride cermet composites
- Large format prints with a 1m Ø x 0.7m build volume
- Build rates in excess of 10 kg/hr. or 1 L/hr.



RAPID PROTOTYPING SERVICES

Looking to develop a new component using AM? Could AM improve the performance of the current part at your processing line?

Capabilities include:

- Ceramic, polymer, and composite printing
- Oxides, carbides, and common polymer materials
- Ink, slurry, and process development
- Part design and development

The NAVSEA 05T NESAR (Navy Expeditionary Sustainment and Repair) team will use HAMR Industries to support the Pacific Battle Damage Exercise (PBDE) by cold spraying parts damaged during the event. HAMR Industries will work with Penn State Applied Research Lab in various scenarios.





- Rapid walkthrough digitization of vessel interior and exterior creating a permanent digital twin for future comparison and analysis.
- High-resolution 3D point cloud and panoramic imagery
- Immediate capture of blast-affected areas and change detection technology to quantify damage
- Operates in GPS-denied and confined environments
- Average Scan Duration Per Compartment: Minutes — Not Hours
- Digital Documentation Enables Rapid Engineering Decision Support



For the Pacific Battle Damage Exercise, the NAVSEA 05T NESAR (Navy Expeditionary Sustainment and Repair) team has developed specific evaluation scenarios for this technology.

Visualization is one of NESAR's 4 primary focus areas as the navy needs more dynamic inspection methods that enable a ship to see itself and the world around it. Digital twin creation utilizing 3D scanning provides the ability to quickly access ship configuration changes and perform internal and external inspections immediately following battle damage.

The Leica BLK2GO system uses Cyclone 3DR automated change detection algorithms to provide rapid, advanced inspection, deviation analysis, and comparison models to visually quantify displacement, hull deformation, and material loss between pre and post blast scans to identify battle damage. This reduces personnel time in hazardous environments and allows real time capture of confined compartments, topside structures, machinery spaces, and repair zones without complex setup or targets. The BLK20 provides shareable 3D datasets for remote engineering analysis, enabling faster battle damage assessment cycles.

NESAR plans to evaluate this technology during this exercise to determine if it should be included with future shipboard battle damage support technology and positioned in various parts of the world to increase the navy's ability to maintain deployed assets throughout assigned missions.



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(201)-512-9500
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LITHIUM SERIES II Tool
Reaction Arm
Storage Case
36V Battery Pack (2)

Battery Charging System
Side Safety Handle
Calibrations Certificate
Operations Manual



For the Pacific Battle Damage Exercise, the NAVSEA 05T **NESAR** (Navy Expeditionary Sustainment and Repair) team has not developed a specific scenario for this technology, however we will utilize their capability (machining, milling, and boring) to assist other technologies in battle damage assessments and repairs.

HYTORQ LITHIUM SERIES II Battery Operated Torque Tool is the most advanced electric torque tool in the market. This powerful, yet lightweight tool allows you to bolt almost anywhere with the capability of real time documentation via the HYTORQ connect app with models equipped with blue tooth. The LST ranges in torque values from 25 – 8,000 ft. lbs.

NESAR plans to evaluate this technology during this exercise to determine if it should be added to future shipboard battle damage support technology which can be positioned in various parts of the world to increase the navy’s ability to maintain deployed assets throughout assigned missions.

INDUSTRIAL
SCIENTIFIC

GAS DETECTION & SAFETY SOLUTION



Radius™ BZ1 | Continuous area gas monitoring around the work zone

RGX® Gateway | Links field devices for live remote visibility

Ventis® Pro5 | Connected personal gas monitors for maintenance teams

Live Monitoring with iNet® | Central command view of alarms, personnel, and conditions

For the Pacific Battle Damage Exercise, the NAVSEA 05T **NESAR** (Navy Expeditionary Sustainment and Repair) team will utilize Industrial Scientific continuous area gas monitoring equipment to assist other Battle Damage Assessment and Repair (BDAR) technologies in the execution of the scenarios as gas free engineers and firewatch personnel may not be on site during actual BDAR response. Combining the Radius BZ1 with other monitoring technology will reduce safety risks.

The Industrial Scientific monitoring series can detect up to seven gases simultaneously and connect your entire worksite with the rugged Radius® BZ1 Area Monitor. Radius BZ1 detects gas hazards 24/7 without the hassle of elaborate wireless setups and maintenance routines. Radius BZ1 just works, no questions asked, so your teams can focus on what's important while knowing that their area monitors are ready for whatever comes their way. Radius shares readings and alarms with other units and personal gas monitors through LENS® Wireless, creating a dynamic safety network that flexes to meet your needs, whether you're setting up a perimeter, identifying leaks, or monitoring confined spaces.

NESAR plans to evaluate this product by utilizing the mobile ad hoc network (MANET) from Persistent Systems in comparison to other remote monitoring systems to support implementation of this technology into the waterfront maintenance community.

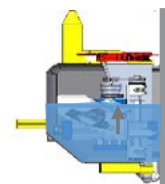
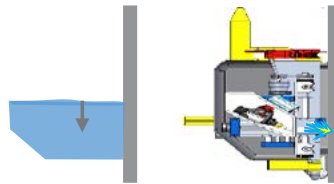
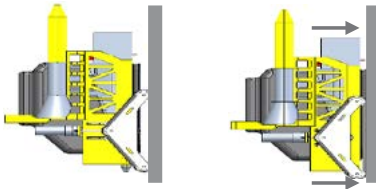
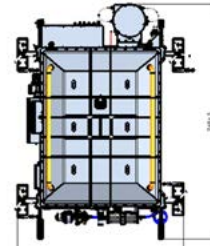
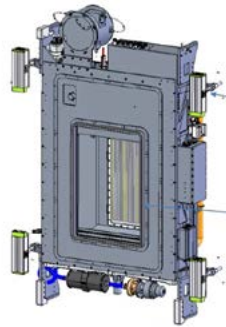
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1-800-DETECTS (4338-3267)
info@indsci.com

Kongsberg Ferrotech



UNDERWATER REPAIR ROBOT



KONGSBERG-FERROTECH will utilize the Hullius robot, a self-propelled, all-in-one solution for inspections and repairs of vessels. Specializing in the permanent repair of damages by use of additive manufacturing technique advanced robotic system designed to conduct underwater hull repairs during Pacific Fleet Battle Damage Exercise (PBDE '26). Representatives from Kongsberg Ferrotech, **NAVSEA 05T's NESAR (Navy Expeditionary Sustainment and Repair)**, and US Navy coordinated diver support and operational planning.

Divers will assist with deployment, positioning, and hull surface preparation to enable proper magnetic attachment and repair operations. Buoyancy assistance and surface cleaning procedures will be used to support safe and effective operation. Robot will then be moved once on hull to demonstrate portability.

Diver safety is the primary consideration. Authorization for Naval Use (ANU), electrical hazard controls, and approved risk mitigation procedures are required prior to diver interaction are the goals of this scenario.

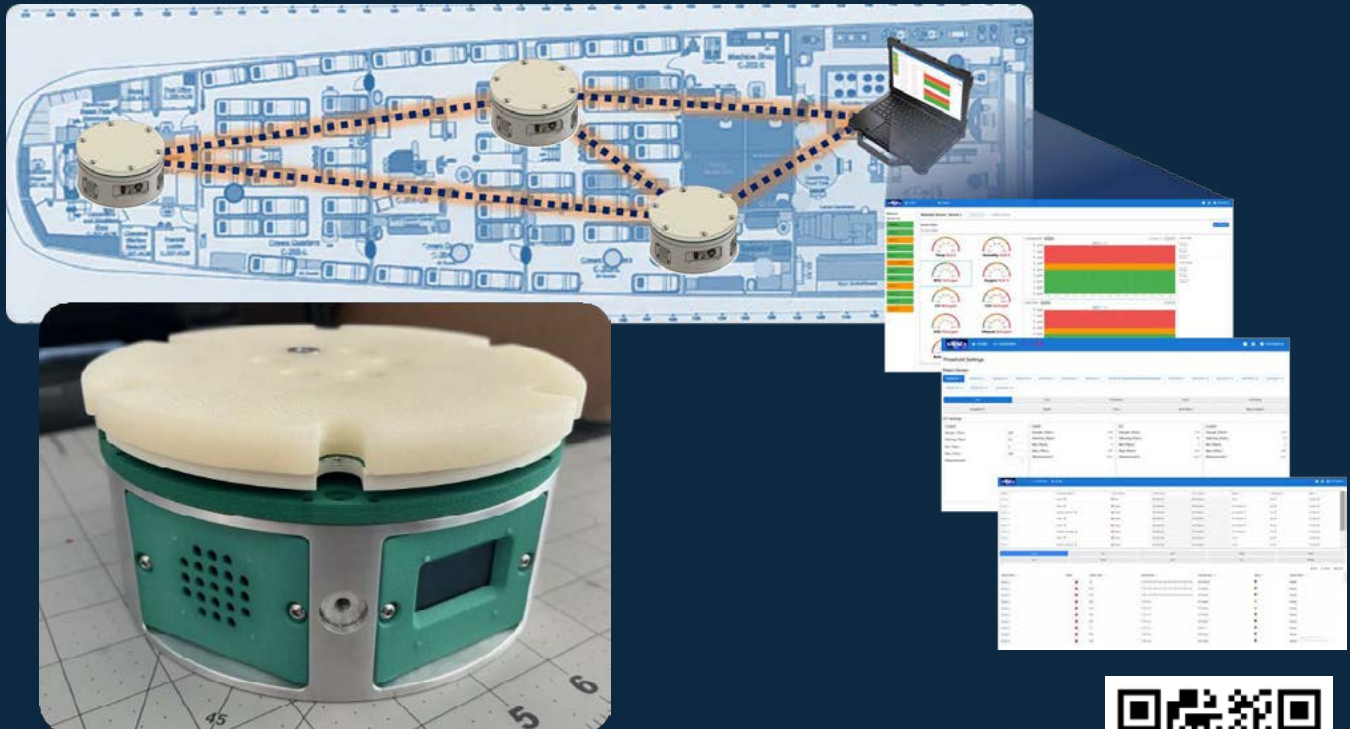
NESAR plans continued use of this technology applications expanding its capabilities and functions for use in battle damage occurrences and ship maintenance needs as a proven technology.



Torgeir Bræin
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+47 952 35 552

AWARENESS – SAFETY – MISSION READINESS

NIMOY – Environment and Confined Space Monitoring



Immediate Hazard Alerts

Instant audible and visual notifications upon the detection of atmospheric hazards.

Constant Situational Awareness

Continuous, time-now understanding of conditions via uninterrupted data logging.

Rugged, Portable, Wireless Network

Durable, independent sensors easily deployed in harsh and difficult-to-reach spaces.

Total Confined Space Safety

Monitoring of multiple disconnected and remote locations from a single, clear interface



Connect



In partnership with the Kostas Research Institute at Northeastern University, the NESAR team has developed the NIMOY Environment and Confined Space Monitoring (ECSM) system which delivers unparalleled safety in hazardous and confined industrial environments. It provides warfighters with critical, real-time situational awareness through a network of rugged, wirelessly connected sensors. These devices continuously sample the atmosphere, record vital data, and trigger immediate audible and visual alerts if conditions become unsafe. This ensures personnel have a precise, “time-now” understanding of their surroundings, significantly improving operational safety and mission effectiveness.

During the PACFLT Battle Damage Exercise (PBDE), NIMOY-ECSM will be protecting personnel across two critical phases. In the initial at-sea phase, the system will be deployed to monitor spaces immediately following explosive detonations, enabling real-time awareness for damage control teams during remediation efforts. For the subsequent two-week repair phase, NIMOY-ECSM will provide continuous, uninterrupted monitoring of the shipboard environment. This persistent oversight will ensure that any atmospheric changes are identified instantly, safeguarding repair crews and enhancing overall readiness.



- Tamper proof; the LOKRING fitting is designed as a permanent joint.
- No fumes or smoke are produced, eliminating the need for special ventilation and a safer environment particularly in confined spaces. No HAZMATs are used in the process or created by the process.
- Eliminates hydrostatic testing, flushing and NDT. Inspection is 100% visual regardless of service.
- Weld position and the presence of liquids or gas do not affect the joint quality.
- Redundant metal-to-metal seals produce a gas-tight connection that is safe for services in fire hazardous areas and systems. The metal seals will not melt or degrade during fire.

www.lokring.com

For the Pacific Battle Damage Exercise, the NAVSEA 05T's **NESAR** (Navy Expeditionary Sustainment and Repair) team has developed specific evaluation and repair scenarios for this technology, allowing NAVSEA to test for potential expanded shipboard use. Lokring fittings do not require hot work controls during the installation process. Spark producing evolutions like grinding, welding or brazing are not associated with a Lokring installation. This capability allows Battle Damage and Repair (BDAR) teams to enact emergent repairs to piping systems quicker (no hot work authorization required) and safer (greatly reduces fire risk at the repair site) to restore the ship to operational status.

Working with NAVSEA's technical authorities, the **NESAR** PBDE 26 test plan includes fittings that are not currently authorized for use with a goal of expanding approval. Lokring tooling can be battery operated, making this technology a good candidate for enacting repairs in remote locations with limited services. **NESAR** recommends that this technology be evaluated for future shipboard battle damage lockers.

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Mactech is a global leader in on-site machining solutions. When something in the field requires precision machining and cannot be brought to a shop for repair; we build and bring the machining equipment to your site. Any time, any day, any problem, Mactech is there for you.

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- Portable Flange Facing
- Portable Sawing and Pile Cutting
- Portable Heat Treating and Stress Relieving
- Custom Portable Machining Equipment
- Shaft Machining

DIFFERENTIATORS:

- 100% Made in the USA
- ISO 9001:2015 Certified
- 50+ Years in business
- Developed by Machinists for Machinists

For the Pacific Battle Damage Exercise, the NAVSEA 05T NESAR (Navy Expeditionary Sustainment and Repair) team has not developed a specific scenario for this technology, however we will utilize their capability (machining, milling, and boring) to assist other technologies in battle damage assessments and repairs.

MACTECH specializes in portable machining and heat treating equipment. Their equipment can perform under virtually all conditions and employs innovative designs and excellent durability. They are industry leaders in machining, line boring, milling and drilling using technology developed for machining by machinists. If the tool doesn't exist for the job, they'll custom make it.

NESAR plans to evaluate this technology during this exercise to determine if it should be added to future shipboard battle damage support technology which can be positioned in various parts of the world to increase the navy's ability to maintain deployed assets throughout assigned missions.



MOM SPS RAPID REPAIR KIT



Rapid Structural Repair – Anywhere, Anytime

- **Trained Sailors** – MOM SPS Training courses provided to enable ships crew to install the MOM SPS Rapid Repair Kit.
- **Blast and Ballistics Options** - Optional MOM SPS configurations designed to improve survivability against blast damage and ballistic impact.
- **Permanent Structural Repair** – Proven SPS Technology restores strength, stiffness, and fatigue performance.
- **Designed for Remote Operations** – Ideal for front line complex warships at-sea, and emergency repair scenarios.
- **Engineered & Assured** – Backed by MOM engineering procedures, QA/QC, and remote technical support.
- **Globally Proven MOM SPS Solution** – Trusted on ships, offshore structures, and critical assets worldwide.
- **Operational Continuity** – Repairs carried out without interrupting critical operations.
- **Scalable Repair Sizes** – Suitable for impact damage, cracks, corrosion damage, and fatigue failures.
- **Repeatable, Standardised Repairs** – Consistent outcomes using pre-engineered MOM procedures.
- **Remote Engineering Oversight** – Optional live QA and technical assurance from MOM specialists.
- **Reduced Re-Supply Burden** – Lightweight, modular kit with predictable consumable requirements.
- **Supports Operational Readiness** – Enables rapid return to service without shore-side support.
- **Cold Work Options** – Eliminates fire risk and hot work permits in sensitive environments.
- **Rapid Deployment** – Compact site-ready kit designed for immediate use.

MARINE OFFSHORE MANAGEMENT'S MILITARY-TESTED MOM SPS REPAIR SYSTEM ENGINEERED FOR FAST RESPONSE TO STRUCTURAL DAMAGE FOR FRONT LINE COMPLEX WARSHIPS AT SEA

For the Pacific Battle Damage Exercise (PBDE 26), the NAVSEA 05T **NESAR** (Navy Expeditionary Sustainment and Repair) team has developed specific evaluation and repair scenarios for damaged structure temporary repair, allowing NAVSEA to test for potential expanded use during remote repair evolutions.

Marine Offshore Management's Sandwich Plate System (SPS ©) Technology is a proven composite repair kit that replaces traditional stiffened steel systems in damaged areas aboard ship. It combines two steel plates with an elastomer core to deliver high strength, reduced weight, and faster construction. Its high strength-to-weight ratio enables material and foundation savings, while prefabrication can improve quality, safety, and schedule certainty. SPS is applicable to both new build and asset life-extension, including cold-work solutions that minimize operational downtime.

With over 30 years of use across maritime, infrastructure, buildings, and offshore sectors, SPS is a mature, low-risk technology. It also supports objectives through reduced material use, lower embodied carbon, recyclability, and extended asset life. In summary: SPS offers a strategic, commercially efficient, and sustainable alternative to conventional repair systems.

NESAR plans continued use of this technology applications expanding its capabilities and functions for use in battle damage occurrences and ship maintenance needs as a proven technology.

Nabors Hydrogen & Electrical Generation System

Technology Description - The DOD has an immediate need to provide reliable, non-hydrocarbon derived energy, at the edge. Solutions must be efficient, durable, and cost-effective. Our solution is a containerized power generation system, fed by small amounts of solar power and fresh water. Fresh water is converted, via electrolysis, to oxygen and hydrogen. The hydrogen is stored in a low-pressure hydride. Hydrogen is fed to a fuel cell, converting the stored hydrogen into electricity and storing in a buffer battery bank. From there, all traditional electric equipment or accessories are powered.



The system provides an alternative power source, easing the reliance and logistical burden of diesel. Advanced hydrogen and battery technologies are the next frontier for operational energy.

Technology Readiness

Technology Maturity: TRL 7

Nabors demonstrated a fully-functional 25kw solution For NAVSEA 05T at SALV-EX at Ford Island, Oahu within a 10ft container.

The unit provided power to several EMARC shops to conduct repair exercises.

The exercise was a broad success, demonstrating a hydrogen/electrical power supply that ran silently and provided sufficient energy for the exercise.

Goals

Nabors requires additional field testing to transition Prototype system to production-ready model.

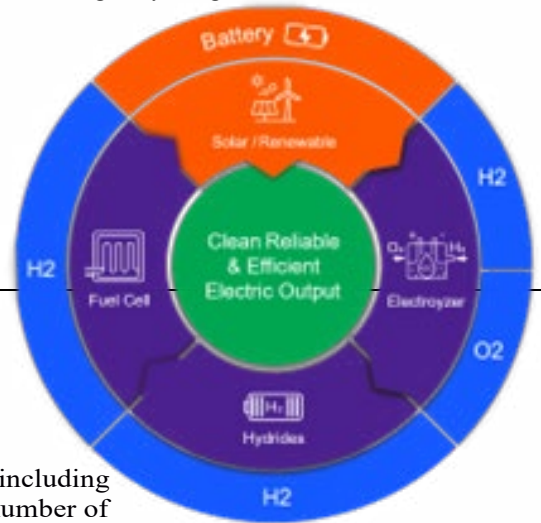
Upgrades will include low-pressure hydrides, battery bank and control system to allow for fully autonomous operations.

Other Information

Nabors' hydrogen power solution is modular and capable of providing power in a variety of environments and applications.

4kw-25kw solutions already deployed / tested, while systems as large as 1mw are achievable within 12 months.

Nabors Industries develops, builds, and operates drilling rigs, onshore and offshore, in all parts of the world. All R&D, manufacturing, software development, and efficiency-enhancement efforts are housed internally and controlled through a strategically integrated vertical structure.



For the Pacific Battle Damage Exercise, the NAVSEA 05T **NESAR** (Navy Expeditionary Sustainment and Repair) team has developed specific evaluation and repair scenarios for the technology, allowing NAVSEA to test for potential expanded shipboard use. Nabors water dependent hydrogen cell technology is to supply power needs pier side and shipboard to support habitability, assessments and repairs, including a number of welding machines, any equipment charging stations and a number of pier side expeditionary repair containers. The system will undergo scenario testing to assess its capability to maximize energy output from limited amounts of fuel.

NESAR plans to evaluate this product in comparison to other remote power supply systems to determine if it should be added to future shipboard battle damage support technology which can be positioned in various parts of the world to increase the navy's ability to maintain deployed assets throughout assigned missions. **NESAR** also recommends maintenance facilities consider acquiring this design to support unplanned events.

Nabors Corporate Services
Nabors.com
 Small business: No publicly-traded corporation

Tamas Csrefko, Business Development
 Manager
 832-378-5300
Tamas.Csrefko@nabors.com

HEXEGEN[®]

MAGNASEAL

a NEOTHANE product

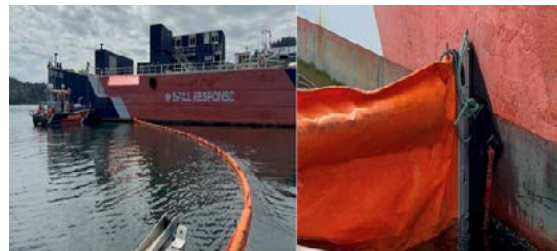


The **Magnaseal Leak Patch** combines the strength of neodymium magnets with the flexibility and chemical resistance of urethane to deliver a rapid, reliable, reusable solution. Naval damage control teams can respond instantly to hull breaches, pipe failures, and hazardous material leaks, even in wet, corrosive and dynamic conditions. The Magnaseal will grip tightly to stay in place, with the ability to flex concavely or convexly. Once applied to the hull of the ship, the Magnaseal Boom Magnet will stay in place, without sliding down or easily becoming dislodged.

Benefits:

- The magnetic grip of the Magnaseal comes from the great number of magnets in each product (varying with size of product)
- The unique design of the magnets allows for flexibility
- The specific qualities of the urethane allow for chemical resistance when in contact with common chemicals
- Magnaseal can be employed quickly and will adhere instantly to ferrous surfaces
- Durable construction allows conformity to irregular or damaged surfaces
- Ease of application allows for minimal manpower to mitigate the situation
- Once the situation is under control, the Magnaseal Patch and Boom Magnet can be removed, deconned, and used again

- The Magnaseal line of products are quick, and reliable, improving safety for damage control teams, minimizing environmental impacts and mitigation costs



For the Pacific Battle Damage Exercise, the NAVSEA 05T NESAR (Navy Expeditionary Sustainment and Repair) team will utilize the Magnaseal patch to repair actual holes in varying degrees caused by actual battle damage. NESAR plans to evaluate this emergent repair device during test scenarios to determine if it should be considered with future shipboard battle damage support technology and positioned in various parts of the world to increase the Navy's ability to maintain deployed assets throughout assigned missions.



Contact: Elliott Chewins echewins@neothane.com 647-333-7860

Bondstrand Marine Pipe Systems



NOV Bondstrand Glassfiber Reinforced

Epoxy (GRE) piping systems have been installed on the HMS Queen Elizabeth since 2010 in the chilled water distribution system (supply and return), Waste heat hot water, ballast system and sea water cooling system.

Benefits of Bondstrand GRE piping

- Low operating and significant through life cost savings with minimal maintenance
- Fast track, cost effective and safe installation
- Lightweight, GRE pipe is on average 85% lighter than comparable steel pipe and 75% lighter than Copper Nickle alloys.
- Superior resistant, internal and external corrosion resistance to saltwater, chemicals and organic matter
- Increased safety by eliminating hot work during the installation process

For the Pacific Battle Damage Exercise, the NAVSEA 05T **NESAR** (Navy Expeditionary Sustainment and Repair) team has developed specific evaluation and repair scenarios for this technology, allowing NAVSEA to test for potential expanded approvals. Unlike many other products, NOV Bondstrand GRE piping and fittings do not require hot work controls during the installation process. Spark producing evolutions like grinding, welding or brazing are not associated with the fitting installation. This capability allows Battle Damage and Repair (BDAR) teams to enact emergent repairs to piping systems quicker (do not have to wait on hot work authorization) and safer (greatly reduces fire risk at the repair site) to restore the ship to operational status.

Working with NAVSEA's technical authorities, the **NESAR** PBDE 26 test plan includes piping and fittings that have not yet been approved for use with a goal of expanding current limited approval. NOV Bondstrand piping and fittings are lightweight and require handheld tools only for installation, making this technology a good candidate for enacting repairs in remote locations with limited services. **NESAR** plans to evaluate this product to determine if it should be added to future shipboard battle damage support technology which can be positioned in various parts of the world to increase the navy's ability to maintain deployed assets throughout assigned missions.



OKSI

Intelligent. Adaptive. Integrated.

REDUCE RISK, SAVE TIME, COMPLETE MORE DRAFT DETERMINATIONS

RAPIDD™ Autonomous Draft Determination System

Robust Autonomous Precise Image-based Draft Determination

- Autonomous, Small-Boat-Free Operations
 - Waterproof maritime sUAS eliminates hull-side personnel and small-boat requirements
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 - Stereo vision + OCR + onboard AI processing for repeatable draft readings
- >95% Labor Cost Reduction
 - ~\$400 per manual measurement → ~\$17 per RAPIDD measurement
- 83% Time Reduction Per Vessel
 - ~60 minutes reduced to ~10 minutes per measurement
- Weather-Resilient Schedule Reliability
 - Reduces weather-driven delays and costly vessel queues



TEN-MINUTE AUTONOMOUS MEASUREMENT REPLACES A FOUR-PERSON, ONE-HOUR EVOLUTION AND ELIMINATES \$100K-CLASS DELAY

For the Pacific Battle Damage Exercise, the NAVSEA 05T NESAR (Navy Expeditionary Sustainment and Repair) team has developed specific evaluation scenarios for this technology.

Visualization is one of **NESAR's** 4 primary focus areas as the navy needs more dynamic inspection methods that enable a ship to see itself and the world around it, both above and below the water line. Drones provide the ability to access ship configuration changes and perform various internal and external inspections.

As an example of how drones can improve a tedious inspection requirement is the NSTM 096 mandated inclining experiments (35-40 annually across the fleet) which require precise draft measurements (objective 1/16"; goal 1/8") using personnel in small boats with draft tubes. This method poses safety risks, is weather-dependent, and can delay vessel delivery schedules. OSKI provides the Navy with an autonomous drone system using precision imaging and AI-assisted draft mark readings that eliminates personnel risk, reduces setup time, while providing standardized, repeatable measurements for naval inclining experiments. **NESAR** plans to evaluate this technology during this exercise allowing NAVSEA to test for expanded use across the navy, including battle damage assessment.

PARKER FASTSEAL™

Make fast ORFS tube connections anywhere
without brazing or flanging



The Benefits

- No Brazing or welding required
- Installs with hand tools
- Zero interference installation, slides in without tube manipulation
- Captive O-Ring groove (CORG) retains seal during installation.
- ¼" and ½" sizes in Stainless Steel
- Can be used as an inline splice for tubing repair
- Pressure rating between 6,000 and 5,000 psi depending on size and material.



For the Pacific Battle Damage Exercise, the NAVSEA 05T **NESAR** (Navy Expeditionary Sustainment and Repair) team has developed specific evaluation and repair scenarios for this technology, allowing NAVSEA to test for potential expanded approvals. Unlike many other products, Parker fittings do not require hot work controls during the installation process. Spark producing evolutions like grinding, welding or brazing are not associated with Parker fitting installation. This capability allows Battle Damage and Repair (BDAR) teams to enact emergent repairs to piping systems quicker (do not have to wait on hot work authorization) and safer (greatly reduces fire risk at the repair site) to restore the ship to operational status.

Working with NAVSEA's technical authorities, the **NESAR** PBDE 26 test plan includes fittings that have not yet been approved for use with a goal of expanding current limited approval. Parker Fastseal fittings require handheld tooling only, making this technology a good candidate for enacting repairs in remote locations with limited services. **NESAR** recommends that this technology be evaluated for future shipboard use within battle damage lockers.

Phastite for Pipe

Non-Welded Solution for High-Pressure Piping



ENGINEERING YOUR SUCCESS.

- Non-Welded option for Pipe connection
- ASTM A312/ISO 6708
- 10,000 PSI operating pressure
- Compatible with Sch 40 to Sch XXS pipe
- Rated to subsea depths of 15,000 feet
- Sizes ¾" to 2" Code 61 and 62, Seal Sub, O-ring Boss



For the Pacific Battle Damage Exercise, the NAVSEA 05T **NESAR** (Navy Expeditionary Sustainment and Repair) team has developed specific evaluation and repair scenarios for this technology, allowing NAVSEA to test for potential expanded approvals. Unlike many other products, Parker fittings do not require hot work controls during the installation process. Spark producing evolutions like grinding, welding or brazing are not associated with Parker fitting installation. This capability allows Battle Damage and Repair (BDAR) teams to enact emergent repairs to piping systems quicker (do not have to wait on hot work authorization) and safer (greatly reduces fire risk at the repair site) to restore the ship to operational status.

Working with NAVSEA's technical authorities, the **NESAR** PBDE 26 test plan includes fittings that have not yet been approved for use with a goal of expanding current limited approval. Parker Phastite for Pipe fittings require handheld tooling only, making this technology a good candidate for enacting repairs in remote locations with limited services. **NESAR** recommends that this technology be evaluated for future shipboard use within battle damage lockers.

Phastite® Tube Connectors

Permanent Instrument Tube Connectors



ENGINEERING YOUR SUCCESS.

- Supplied pre-assembled, no loose parts thus eliminating potential assembly errors
- No additional operations using equipment that could lead to injury are required
- Permanent assembly is tamper proof
- Permanent leak free connections without the need for threaded components, thus removing potential loosening problems due to excess movement
- No Hot Work! Fire or explosion risks are eliminated along with any potential fume inhalation
- No brittleness or corrosion implications (caused by welding heat for example)
- Sizes ¼” to 1” SS, Alloy 625 and 825, Super Duplex
- Pressure rating 2,400 to 17,400 psi depending on size and material



For the Pacific Battle Damage Exercise, the NAVSEA 05T **NESAR** (Navy Expeditionary Sustainment and Repair) team has developed specific evaluation and repair scenarios for this technology, allowing NAVSEA to test for potential expanded approvals. Unlike many other products, Parker fittings do not require hot work controls during the installation process. Spark producing evolutions like grinding, welding or brazing are not associated with Parker fitting installation. This capability allows Battle Damage and Repair (BDAR) teams to enact emergent repairs to piping systems quicker (do not have to wait on hot work authorization) and safer (greatly reduces fire risk at the repair site) to restore the ship to operational status.

Working with NAVSEA’s technical authorities, the **NESAR** PBDE 26 test plan includes fittings that have not yet been approved for use with a goal of expanding current limited approval. Parker has an optional manual Enerpac Pump for tooling, making this technology a good candidate for enacting repairs in remote locations with limited services. **NESAR** recommends that this technology be evaluated for future shipboard use within battle damage lockers.



PennState
Applied Research
Laboratory



Penn State
ARL

On-Board Rudder Stock Repair

Expeditionary Cold Spray Sustainment and Repair

- Leader in Cold Spray expeditionary repair
- Completed 4 high profile repairs – saved over \$100M in costs, 7 months of cumulative dry-dock time, and enabled scheduled deployment of key assets
- High-pressure and Low-pressure Cold Spray systems
- Portable robotics with quick disconnects and a suite of tools
- Dust containment, ventilation, and industrial hygiene
- Over 100 parts have been Cold spray repaired and fielded
- In-place machining capabilities
- Easily-configurable solution ships in as few as 4 Pelican cases; full system ships in 20' Conex container + 10' Conex container with nitrogen generation



HAMR



SOLVUS GLOBAL



On-Board Rudder Stock Repair



Portable Nitrogen Generator



Pier-Side Rudder Stock Repair

Penn State ARL is an established leader in high pressure Cold Spray technology with expertise in expeditionary repair. ARL will bring a suite of Cold Spray systems, robots, nitrogen generator, portable dust collection system, and tools to support the Pacific Battle Damage Exercise (PBDE), with the NAVSEA 05T **NESAR** (Navy Expeditionary Sustainment and Repair) team. ARL has developed the process to address industrial hygiene, gas free space requirements, logistics, per-machine/repair area preparation, Cold Spray deposition and post spray machining. The system has been demonstrated on several repairs.

ARL will be providing training for HAMR Industries and Solvus Global, two companies that will be conducting expeditionary Cold Spray in the future. ARL will provide expeditionary Cold Spray expertise for the low-pressure Cold Spray participants. In addition to Cold Spray expertise, ARL will provide robotic expertise, robot integration with the low-pressure systems, repair approaches on an as-needed basis.

ARL also has experience in other sustainment and repair technologies that can be leveraged by the PBDE participants. ARL, HAMR and Solvus Global personnel will be available to support other efforts as request by **NESAR**.

Rosebank Engineering



Low Pressure Cold Spray | Centerline PX

In_field.repairs?simple.™.reliable.

WITH OVER 15 YEARS' EXPERIENCE OF DEFENCE COLD SPRAY APPLICATIONS, ROSEBANK ENGINEERING IS THE TRUSTED AND LEADING DEFENCE AM PROVIDER IN THE INDO-PACIFIC REGION



ADVANCED DEFENCE COLD SPRAY SUSTAINMENT

Operational, certified, deployable Cold Spray capability for aerospace and maritime platforms

- Proven in-field aerospace repairs with Royal Australian Navy, Royal Australian Air Force and Royal Malaysian Air Forces.
- Corrosion, wear, and erosion restoration without heat-affected zones.
- Restore critical dimensions, deliver life-extension of critical components.
- Accredited Engineering Organisation to support customer engineering and technical requirements.
- Rapid regional sustainment response for deployed assets.
- Suitable for aircraft, maritime, and complex Defence weapon systems.

CORE CAPABILITY

Centerline SST PX Low Pressure

- Low infrastructure footprint, high portability, with high process stability.
- Precision, repeatable, certifiable deposition control.
- Proven in-field aerospace repairs
- Facility-based and deployable sustainment models supported

PROVEN DEFENCE EXPERIENCE

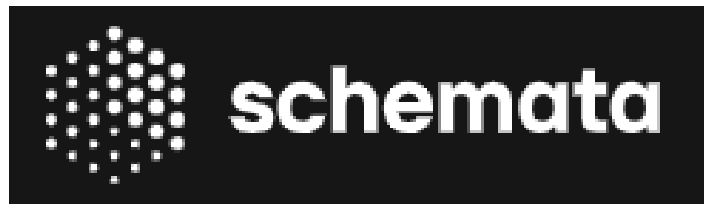
Trusted Cold Spray provider of the Australian DoD

- 15+ years Defence Cold Spray application experience.
- World-first F/A-18 on-wing Cold Spray repairs completed.
- Integrated with Defence primes and airworthiness authorities.
- Transitioned Cold Spray from R&D to operational sustainment.
- Extensive aerospace component repair portfolio & materials expertise.

OPERATIONAL VALUE TO US NAVY AND NAVY EXPEDITIONARY SUSTAINMENT & REPAIR

For the Pacific Battle Damage Exercise (PBDE 26), the NAVSEA 05T Navy Expeditionary Sustainment and Repair (**NESAR**) team developed targeted Cold Spray evaluation and repair scenarios to assess expanded use in remote and expeditionary operations.

Cold Spray provides significant operational value by restoring mission-critical components, reducing replacement costs, and improving platform availability. **Rosebank Engineering** delivers a certified, combat-relevant sustainment capability and stands ready to support U.S. Navy and allied forces across the Indo-Pacific. NESAR plans continued expansion of Cold Spray applications for battle damage repair and ship maintenance as a proven expeditionary sustainment solution.



Building the World's AI Interface

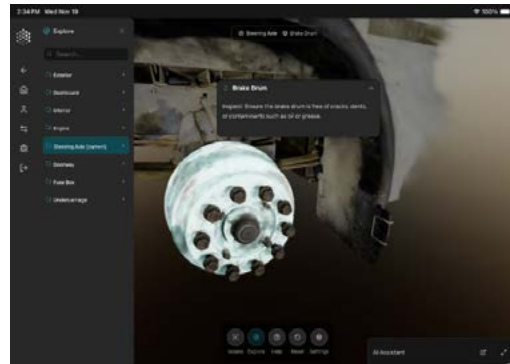
Immersive, AI-native training built for the speed and scale of modern operations.

Schemata is a spatial intelligence company with powerful AI 3D reconstruction and scene understanding tools for defense and industrial customers. Using proprietary Gaussian Splatting technology, Schemata converts ordinary imagery, photos, video, and data from robotic and handheld capture devices into photorealistic, measurable, and “queryable” 3D environments in hours. These reconstructed environments can serve as a foundational layer for a range of mission-critical applications, including custom training module generation, battle damage assessment, maintenance operations, mission planning rehearsal, and more.

Schemata have received an AFWERX Phase II SBIR, TACFI, Army CPE ST3 OTA, and NAVSEA awards to deploy spatial training capabilities across the armed services.

Core capabilities include:

- Rapid 3D reconstruction from handheld cameras, robotic platforms, drones, or existing video, reducing capture-to-usable-asset time from weeks to hours
- AI scene understanding that identifies, segments, and labels objects and components within the reconstructed environment, enabling downstream queries, anomaly detection, and change tracking
- Modular application layer that supports custom training module generation, battle damage assessment, interactive 3D technical manuals, equipment familiarization, vehicle walkarounds, and spatial reference for maintenance procedures
- Hardware-agnostic delivery across tablets, smartphones, and standard desktop browsers
- Cloud and edge deployment options, including IL4 authorization via Game Warden for secure DoD use



Visualization is one of NESAR’s 4 primary focus areas as the navy needs more dynamic inspection methods that enable a ship to see itself and the world around it. Digital twin creation utilizing 3D scanning provides the ability to quickly access ship configuration changes and perform internal and external inspections immediately following battle damage.

SCHEMATA specialize in 3D AI modeling and training. Modular sensing and data-fusion platforms that can be used to support ship survivability testing, structural monitoring, and operational readiness assessments. The system integrates distributed sensors, onboard processing, and secure data export for engineering evaluation. Their technology can scan areas / equipment, make 3D digital models, and with AI will allow for trouble shooting damage or provide user friendly repair training. Training with 3D modeling can be developed and sent to the sailor or mechanic in the field for just in time training or provide a virtual on the spot reference guide.

NESAR plans to use Schemata to capture digital twin images of pre-detonation, post-detonation, and daily progress of spaces where work occurred. The pre-detonation images will serve as our reference point for repair planning. Other images will help communicate progress and any related issues.

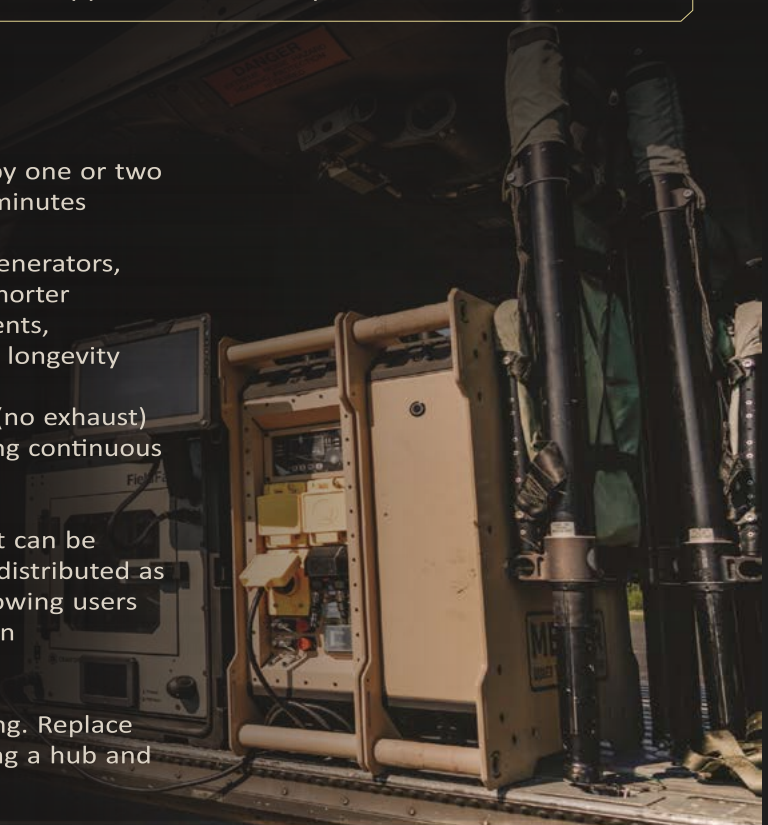


METEOR

METEOR is a highly flexible and scalable advanced power system designed to support a wide range of power applications at the point-of-need.

QUIET TACTICAL POWER

- **Speed and Mobility:** Can be hand-carried by one or two persons and made operational in under three minutes
- **Hybrid operation** with legacy combustion generators, allowing them to run at optimal efficiency for shorter durations, reducing fuel sustainment requirements, minimizing mechanical stress, and maximizing longevity
- **Versatile deployment:** suitable for indoor (no exhaust) and all-weather outdoor environments enabling continuous operations while on the move
- **Modular:** METEOR modules are like legos that can be quickly combined to create larger systems, or distributed as smaller point-of-need systems at distance, allowing users tailor runtime and power to suit specific mission requirements
- **Hot swap enabled:** save time from recharging. Replace low modules with full modules in seconds using a hub and spoke model



For the Pacific Battle Damage Exercise, the NAVSEA 05T **NESAR** (Navy Expeditionary Sustainment and Repair) team has developed specific evaluation and repair scenarios for the technology, allowing NAVSEA to test for potential expanded shipboard use by not having to wait for a power line to be extended several hundred feet for a repair in a remote area of the ship.

To ensure reliability, technology will be subjected to rigorous, multi-scenario evaluation of its power supply performance and integration with other technologies. Testing to include reliability, verification of stability across a wide range of power supply operating conditions, interaction with different power supply inputs, and overall power supply performance.

NESAR plans to evaluate this product in comparison to other remote power systems to determine if it should be added to future shipboard battle damage support technology which can be positioned in various parts of the world to increase the navy's ability to maintain deployed assets throughout assigned missions.

Technology.Integrator.™.Solution.
Provider.for.Point.of.Need.Repair



Key Performance & Readiness Milestones

- Increased Readiness with Deployable Repair: Developing containerized hybrid manufacturing machine shop for deployable repair of specific US Army assets scheduled for field testing by end-of-year to extend the lifecycle of frontline combat systems and reduce cost by 30% over new production. [1]
- Expeditionary Flexibility: Partnered with NAVSEA to develop automated and robotic in-situ wire DED capability for hull repair.
- Critical Asset Delivery: Fabricating nine 500 lb CuNi parts for US Navy Submarines and Carriers; restoring a domestic supply chain for parts previously deemed unproducible. [2]
- Proven Feedstock for AM: Application specific powder metallurgy feedstock development transitioned to full-scale production, securing high-performance feedstock for defense systems.



**CINDER Containerized
Machine Shop [1]**



**500 lbs CuNi part in
production for NAVSEA [2]**



**World's largest high throughput
large scale cold spray AM cell**

Solvus Global delivers mission-critical resilience through a decade of expertise in hybrid manufacturing and robotics. While the Solvus Global ecosystem spans the entire supply chain from feedstock development (Powders on Demand) to large scale AM (Mammoth Metalworks) and data-driven process monitoring (APEX), our core focus is solving the world's toughest problems through the development of matured technology and our people, restoring readiness where it matters most!

In partnership with NAVSEA, Solvus is transitioning proven Wire DED technology into portable platforms for ship hull repair. In collaboration with Penn State ARL and HAMR, Solvus is joining PBDE to deploy expeditionary cold spray solutions for shipboard repair. Solvus is also delivering the containerized CINDER repair system under the US Army CATALYST program to enable repair of previous unrepairable assets. By integrating CBM+ inspection with robotics; we build lifecycle profiles that enable proactive maintenance. From the Submarine Industrial Base to NASA, Solvus Global provides the domestic, technology-driven toolkit required to solve the Navy's toughest sustainment and supply chain challenges.

For the Pacific Battle Damage Exercise (PBDE 26), the NAVSEA 05T's NESAR (Navy Expeditionary Sustainment and Repair) team has developed specific evaluation and repair scenario allowing NAVSEA to test for potential expanded use during remote repair evolutions. NESAR plans to use Solvus Global to manufacture parts damaged from PBDE detonation or other emergent parts as deemed necessary to showcase the company's expertise and capabilities.

(508) 373-2750

inquiries@solvusglobal.com





STATA

FIRE PREVENTION THROUGH INTELLIGENT OBSERVATION

Fire watch that sees heat signatures **before the human eye**

Stata Fire Watch Camera uses AI and dual-sensor thermal + HD cameras to detect abnormal heat buildup during hot work — enabling earlier intervention. Instant alerts, real-time data, and clear audit trails to keep crews and assets safe.



Stata Proactively Detects

- Thermal anomalies
- Heat rate of rise
- Incipient fire stages
- Personnel presence
- Combustible proximity
- Equipment compliance

Smart Observation

Dual-sensor HD + thermal cameras with AI-powered scene analysis detect heat patterns before they're visible to the human eye. Built for harsh, high-risk environments.

Instant Alerts

4-stage color-coded alert system with escalating notifications — from text and email alerts to on-site alarms and phone calls. Location and image included with every alert.

How It Works

01 Monitor

Camera watches hot work area with thermal + optical sensors

02 Detect

AI identifies abnormal heat buildup and thermal anomalies

03 Alert

Crews receive instant alerts to intervene before escalation

The Stata Advantage

- Earlier Detection**
Identify heat anomalies before the human eye can.
- Faster Response**
Instant multi-channel alerts for rapid intervention.
- Reduced Risk**
Proactive prevention helps reduce fire incidents.
- Better Oversight**
Automatic documentation and compliance audit trails.

For the Pacific Battle Damage Exercise, the NAVSEA 05T NESAR (Navy Expeditionary Sustainment and Repair) team will utilize STATATECH remote firewatch capability to assist other Battle Damage Assessment and Repair (BDAR) technologies in the execution of the scenarios as gas free engineers and firewatch personnel may not be on site during actual BDAR response.

Combining STATATECH equipment with other monitoring technologies will reduce safety risks.

The STATATECH system delivers real-time thermal monitoring for hot work and high-risk sites. The cameras and analytics detect dangerous heat events early, then notify your team through text, email, WhatsApp, and voice supporting a rapid response. It also has the capability to use AI analytics to recognize combustible material around a hot work site that could become a fire. It stores data files (off site or in the cloud) that can provide logs for compliance and safety audits, all from one streamlined platform. The system detects temperature spikes in seconds with advanced thermal imaging technology. It is designed for steel-walled environments, shipyards, and industrial sites.

NESAR plans to evaluate this product by comparison to other remote monitoring systems to support implementation of this technology into the waterfront maintenance community.



Ship Repair at the *Speed of Light*

Sunrez UV Cure Solutions

- Fast Cure (<5 min)
- Easy to Apply
- Virtually Infinite Pot Life
- Non-flammable
- No/Low VOC Formulas
- Proven Durability
- High Corrosion Resistance



For the Pacific Battle Damage Exercise, the NAVSEA 05T **NESAR** (Navy Expeditionary Sustainment and Repair) team has developed specific evaluation and repair scenarios for the technology, allowing NAVSEA to test for potential expanded shipboard use.

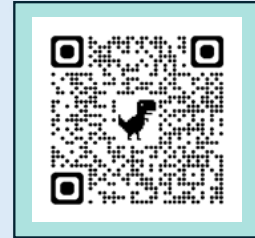
Sunrez technology will undergo piping and bulkhead repair scenario testing to demonstrate and assess its ability to bond to various materials and provide high structural integrity for rehabilitating pipe and repairing bulkheads.

NESAR plans to evaluate this product in comparison to other composite technologies to determine if it should be added to future shipboard battle damage repair lockers and pier side expeditionary repair containers that can be positioned in various parts of the world to increase the navy's ability to maintain deployed assets throughout assigned missions.



Underwater Repair Adhesive

- Applied and cured under water
- Multi-substrate bonding to metals, plastics, glass
- Resilient acrylic combines flexibility and durability
- Use as general-purpose adhesive or patching/filling compound
- Can be sanded, filed, and drilled



To learn more about TDA Research, Inc. visit our website at www.tda.com.

Dr. Girish Srinivas • gsrinivas@tda.com • 303.748.7153

www.tda.com

TDA RESEARCH, INC. | SUITE 100B | 4680 TABLE MOUNTAIN Dr. | GOLDEN, CO 80403

For the Pacific Battle Damage Exercise, the NAVSEA 05T **NESAR** (Navy Expeditionary Sustainment and Repair) team has not developed a specific scenario for this technology, however we will utilize their capability to assist other technologies in battle damage assessments and repairs.

TDA Research Underwater Repair Adhesive is a newly innovated product for bonding various substrates together and filling holes with a repair adhesive that can be applied and cured underwater. There will be chances for the use of this technology in repair of steel surfaces from various battle damage scenarios.

NESAR plans to evaluate this technology during this exercise to determine if it should be added to future shipboard battle damage support technology that can be positioned in various parts of the world to increase the Navy's ability to maintain deployed assets throughout assigned missions.



UNLOCK NEW POSSIBILITIES IN REPAIR, PROTECTION, AND PERFORMANCE

Titomic Kinetic Fusion™ (TKF™) cold spray systems redefine what's possible in component repair, restoration, and surface enhancement. Built for demanding industrial environments, these versatile systems deliver powerful solutions for engine components, molds, and high-value parts, restoring performance while extending service life.

From corrosion protection and sealing to electrically conductive and functional coatings, TKF™ systems enable manufacturers to add performance exactly where it's needed. Titomic's portable solutions offer operational pressures of 4 - 25 bar, coupled with deposition rates of up to 3 kg per hour, which facilitate a wide range of high-impact applications, without the limitations of traditional processes.

Whether you're protecting legacy assets, performing critical repairs, or creating custom surface solutions, Titomic Kinetic Fusion™ delivers the flexibility, reliability, and performance to turn challenges into competitive advantages.

Portable System	TKF™ 523	TKF™ 623
Operating pressure	58 – 87 psi	116 - 290 psi
Max powder consumption	3.9 lb/hour	3.9 - 4.8 lb/hour
Equipment weight	125 lbs	308 lbs
Spraying gun weight	3.7 lbs	10 lbs

For the Pacific Battle Damage Exercise, the NAVSEA 05T NESAR (Navy Expeditionary Sustainment and Repair) team has not developed a specific assessment and repair scenario for this technology; however, we will be utilizing this unique capability to accomplish non-sparking surface preparation evolutions for various assessment and repair scenarios.

Unlike other grinding and cutting tools, this capability has been proven to be used without fear of creating a spark which could introduce a fire safety risk to the repair site. This tool can also be used for application of adhesive mounted studs and removal of excessive weld splatter, cold spray application or corrosion.

✉ info@titomic.us

☎ +1 833 848-6642

🌐 titomic.com

TITOMIC KINETIC FUSION™

TKF™ 523
LOW PRESSURE ●●○

TKF™ 623
LOW/MEDIUM PRESSURE ●●○

MEDIUM & LOW PRESSURE COLD SPRAY SYSTEM

Faster, stronger metal coatings and repairs. Titomic's cold spray system is designed for higher energy deposition, industrial repairs, and advanced additive manufacturing without heat distortion.

- Coat or restore any metal part without heat
- Fuse dissimilar metals to create custom coating solutions





TWINFRA

BUILD 3D DIGITAL TWINS IN MINUTES, NOT DAYS

Near real-time image-based 3D digital twin construction

A Portable 3D Condition Intelligence System

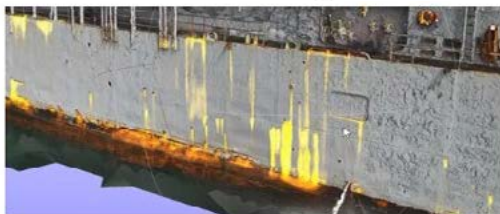


Mission Capabilities

- Enhanced Situational Awareness
- Accelerate Data-Driven Decisions
- Identify Hidden & Developing Damage
- Enable Real-Time Remote Collaboration
- Expedite Damage Assessment & Repair



Platform and sensor agnostic



AI models to detect and map defects such as corrosion in a 3D representation



Ex-USS Paul Foster reconstructed and visualized in Twinfra



Ex-USS Tarawa indoor reconstruction of engine room in Twinfra



Advanced AI analytics including change detection across multiple scans

For the Pacific Battle Damage Exercise, the NAVSEA 05T **NESAR** (Navy Expeditionary Sustainment and Repair) team is evaluating a data fusion and visualization technology that integrates multiple data sources to create and continuously update to create near-real-time 3D models of ship damage.

The goal is to improve situational awareness and expedite decisions on repairs and resource allocation, ultimately enhancing mission effectiveness and readiness in real-world conditions. This demonstration provides a key opportunity for stakeholders to evaluate the system's real-world performance and its impact on decision speed.

Contact

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ENGINEERED FOR
WHAT'S NEXT.

egr.uh.edu



- Non-Welded option for Pipe connection
- ROI: 56% savings versus welded fittings
- ROI: 35% savings versus Brazed fittings
- Eliminates needs for fire watch labor
- Eliminates hot work and fire hazard, especially in fully- outfitted spaces
- Retesting for failed joints ~eliminated- which alone covers material costs
- Zero defect rate on installation (eliminates typical 18% failures from Bronze Silver Brazing)
- Viega offers MegaPress CuNi, the only copper nickel press fitting with NAVSEA approval allowing shipbuilders and Navy personnel to better integrate fittings into onboard systems.

For the Pacific Battle Damage Exercise, the NAVSEA 05T **NESAR** (Navy Expeditionary Sustainment and Repair) team has developed specific evaluation and repair scenarios for this technology, allowing NAVSEA to test for potential expanded approvals. Unlike many other products, Viega fittings do not require hot work controls during the installation process. Spark producing evolutions like grinding, welding or brazing are not associated with Viega fitting installation. This capability allows Battle Damage and Repair (BDAR) teams to enact emergent repairs to piping systems quicker (do not have to wait on hot work authorization) and safer (greatly reduces fire risk at the repair site) to restore the ship to operational status.

Working with NAVSEA's technical authorities, the **NESAR** PBDE 26 test plan includes fittings that have not yet been approved for use with a goal of expanding current limited approval. Viega fittings only require handheld, battery operated tooling, making this technology a good candidate for enacting repairs in remote locations with limited services. **NESAR** recommends that this technology be evaluated for future shipboard use within battle damage lockers

VIEGA:
ALWAYS FIRST CHOICE.

Because we have stood for
joint success for **125 years.**
We're installing **lifelines** for the
buildings of tomorrow.

Dragonfly[®]

VRC[®]
METAL SYSTEMS
High Performance
Metals Deposition

Specifications

- 480V, 3 Phase, 50 Amps
- 35-45 CFM Air or Nitrogen



CAPABILITIES

- High quality and bond strength metal repairs
- Repair of corrosion, wear, and other damage
- Corrosion and wear prevention
- Nickel, copper, aluminum, steel, cobalt and other alloys as well as blends and metal matrix composites

IN-FIELD SUPPORT HARDWARE

- VARK Portable Dust Collector
- Custom dust containment tools and materials
- Portable Robotics with Scan-to-Plan technology
- High pressure compressor and bottle set for sustained field operations



For the Pacific Battle Damage Exercise (PBDE 26), the NAVSEA 05T **NESAR** (Navy Expeditionary Sustainment and Repair) team has developed specific evaluation and repair scenarios for Cold Spray technology, allowing NAVSEA to test for potential expanded use during remote repair evolutions.

The **VRC[®] Dragonfly[™] Cold Spray System** is a portable, field-ready solution designed to restore and reinforce metal components quickly and efficiently. Built for mobility and durability, Dragonfly allows maintenance teams to perform high-quality non-structural repairs directly on site, reducing downtime and eliminating the need for costly part removal or replacement. Ideal for maritime, and heavy industrial applications, it helps extend equipment life, lower repair costs, and improve operational readiness. With user-friendly controls and flexible setup options, the Dragonfly[™] delivers reliable performance wherever repairs are needed.

NESAR plans continued use of Cold Spray applications expanding its capabilities and functions for use in battle damage occurrences and ship maintenance needs as a proven technology.

FIREFLY®

VRC®
METAL SYSTEMS
High Performance
Metals Deposition

Specifications

- 220V, 1 Phase, 40 Amps
- 15-25 CFM Air or Nitrogen



CAPABILITIES

- High quality and bond strength metal repairs
- Repair of corrosion, wear, and other damage
- Corrosion and wear prevention
- Nickel, copper, aluminum, steel, cobalt and other alloys as well as blends and metal matrix composites

IN-FIELD SUPPORT HARDWARE

- VARK Portable Dust Collector
- Custom dust containment tools and materials
- Portable Robotics with Scan-to-Plan technology
- Compatible low-pressure compressor for sustained field operations



For the Pacific Battle Damage Exercise (PBDE 26), the NAVSEA 05T **NESAR** (Navy Expeditionary Sustainment and Repair) team has developed specific evaluation and repair scenarios for Cold Spray technology, allowing NAVSEA to test for potential expanded use during remote repair evolutions.

VRC Metal Systems FireFly™ is a lightweight, highly portable medium-pressure, high-temperature cold spray system designed for expeditionary repair, field deployment, and point-of-need manufacturing. Delivering advanced material deposition performance in a compact, easy-to-deploy platform, FireFly brings industrial cold spray capability directly to the job site. The system supports handheld and robotic operation, operates up to 700°C, features a cool-touch applicator for operator safety, low gas consumption, and advanced ultra-fine powder feeding capability. Compatible with VRC's specialized materials ecosystem, FireFly enables high-value repairs, protective coatings, and advanced manufacturing applications—providing powerful, mobile cold spray performance wherever it's needed.

NESAR plans continued use of Cold Spray applications expanding its capabilities and functions for use in battle damage occurrences and ship maintenance needs as a proven technology.

Western Global - The World's Leading Fuel Storage Partner

WX mobile 1000

Transportable full of fuel & complete with integrated fuel dispensing system, our rugged, double-walled fuel storage tanks offer an efficient solution for site re-fueling and auxiliary fuel supply for generators



- > Transportable full of fuel (must be empty of fuel for air transport)
- > Extending generator run times
- > Used to refuel ground support equipment & vehicles
- > Double-walled with 110% bund capacity so no secondary containment required
- > Stainless steel inner tank suitable for JP8, diesel or gasoline
- > Can be provided with integrated 25GPM pump with 15ft hose



For the Pacific Battle Damage Exercise, the NAVSEA 05T NESAR (Navy Expeditionary Sustainment and Repair) team has developed specific evaluation and repair scenarios for the technology, allowing NAVSEA to test for potential expanded use during remote repair evolutions.

Because an abundance of stable fuel and water is not a given in contested environments, Western Global technology is partnering with other technologies to supply fuel needs. To ensure reliability, the technology will be subjected to rigorous, multi-scenario evaluation of its performance and integration with our technologies.

NESAR plans to evaluate this product in comparison to other remote power supply systems to determine if it should be added to future shipboard battle damage support technology which can be positioned in various parts of the world to increase the navy's ability to maintain deployed assets throughout assigned missions.



T: +1 833 919 3260 | E: defense@western-global.com
W: western-global.com/defense | DUNS : 790231339 CAGE Code : 4WMH3

3M Pipe Repair

ENERGY, ENVIRONMENTAL, HEALTH, AND SAFETY

Problem Statement:

- A section of piping requires reinforcement, bracket attachment, or installation of a protective patch in a location where hot work authorization is limited or unavailable.
- A damaged or compromised section of a bulkhead requires a lightweight temporary or semi-permanent patch, or the installation of sensors, plates, or protective shielding, without disturbing adjacent systems.

Technology Solution Statement:

- 3M VHB Tape provides a proven, durable bonding solution for industrial, transportation, electronics, and construction applications. This acrylic-foam tape technology delivers strong, permanent bonds that replace mechanical fasteners in a wide range of assemblies. Its viscoelastic properties distribute stress, absorb vibration, and maintain bond integrity under challenging conditions. For many maintenance, repair, and assembly scenarios, 3M VHB Tape enables clean, fast, and consistent joining without the sparks, noise, or debris associated with mechanical fastening or welding. This makes it suitable for workspaces with strict safety controls or limited access for traditional tools.
- 3M's VHB Promoter is engineered specifically for use with 3M™ VHB™ Tape Max Series. It's amplifies the bond strength of 3M™ VHB™ Tape Max products.

Benefits Statement:

- 3M VHB Tape is particularly advantageous for:
- Small - medium bonding areas
 - Assemblies affected by vibration or mechanical stress
 - Surfaces where drilling or welding is not feasible
 - Situations requiring reduced noise or debris
 - Applications requiring long-term environmental resistance

Contact

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wfhesse@mmm.com
703-789-3962

Aeroqual

Aeroqual Ranger Particulate Monitor

ENERGY, ENVIRONMENTAL, HEALTH, AND SAFETY

Problem Statement:

Repair processes within a shipyard can generate various types of particulate that are hazardous to workers.

Technology Solution Statement:

The Aeroqual Ranger with PMX particulate sensor head provides accurate, real-time particulate measurements.

Benefits Statement:

Personnel can be alerted immediately when particulate levels within a work area reach an unsafe threshold.

Contact

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BlackStarTech - Studsvik FireSight Robotic Fire Detection

ENERGY, ENVIRONMENTAL, HEALTH, AND SAFETY

Problem Statement:

During both normal and hot work activities, ships and shipyards primarily rely on personnel to monitor and detect the occurrence of a fire. This results in additional costs as well as the risk of human-error, including potential delays and slow response during gaps in monitoring and awareness capability of human fire watches.

Technology Solution Statement:

Our automated technology can detect the presence of thermal abnormalities, smoke and/or vapors, and actual flames over a large monitoring area and instantly alarm locally, activating alarms and lights at a centralized monitoring station, or notify via texts, calls, or alerts that a potential fire is present.

Benefits Statement:

This automated detection and alert process can reduce the notification and response time, as well as reduce the cost/risk of, and dependence on, personnel to monitor spaces and hot work activities.

Contact

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Clarus Fluid Intelligence

Clarus

RELIABILITY IMPROVEMENT

Problem Statement:

Clarus is a service provider and specialty manufacturer of fluid cleaning systems.

Technology Solution Statement:

Clarus provides services, equipment and expertise for fluid systems recovery. Our core service is depot-level work, however our expertise includes trouble shooting fluid systems and solutions. As well as servicing fluid systems, forward-deployed worldwide.

Benefits Statement:

Clarus' expertise in US Naval fluid systems operation and fluid recovery is unmatched in the industry. Our capabilities and expertise provide the bedrock for the DIB oil flushing and chemical cleaning industries.

Contact

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CN-Seamless

CN-Seamless Mach 1

RELIABILITY IMPROVEMENT (HARDWARE)

Problem Statement:

Ship repair and maintenance operations require precise metal cutting in confined, hard-to-reach spaces. Traditional CNC cutting tables are large, stationary, and cannot be brought to the workpiece. Manual cutting is slow, inconsistent, and dependent on highly skilled labor. This limits the speed and quality of hull repairs, structural modifications, and battle damage restoration.

Technology Solution Statement:

The Mach 1 is a portable CNC plasma and oxy-fuel cutting system that and deploys in under a minute directly onto the workpiece. It mounts magnetically, offers a 68” cutting range, and is controlled via tablet. Quick-change attachments allow seamless switching between plasma and oxy-fuel cutting, plus marking and scribing. A new beveling attachment prototype will also be demonstrated at this event.

Benefits Statement:

Brings CNC-quality automated cutting to any location on the ship, eliminating the need to transport materials to a stationary cutting table. Reduces dependence on highly skilled manual cutters. Dramatically speeds up cut prep for hull repairs and structural modifications. The system is compact enough to fit in a rolling case for rapid deployment to any theater or shipyard.

Contact

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Command Strategies

Tech Scout and Assessment

ADVANCED/ADDITIVE MANUFACTURING

Problem Statement:

Government program managers often face significant gaps in identifying disruptive technologies or finding the right industry and academic partners to fulfill complex Research, Development, Test, and Evaluation (RDT&E) requirements. Navigating the federal procurement process, from the cradle of research through final production and fielding, is often fragmented and lacks the necessary buy-in from all critical stakeholders.

Technology Solution Statement:

CS provides a comprehensive Tech Scout and Assessment solution that identifies entities with disruptive technologies and research capabilities for direct sharing with government organizations, specifically the Department of War (DOW) agencies such as NAVSEA. Serving as an honest broker, CS connects PMs with technology partners and builds multi-party consortia between academia and industry to address mission-critical needs. This model drives the requirement from the end user while providing necessary policy and funding guidance.

Benefits Statement:

- Partnering with CS provides several quantifiable and strategic benefits:
 - Consortium development across the entire RDT&E spectrum, including direct access to laboratory-level researchers, senior program executives, and decision-makers across the DoW and Intelligence Communities.
- Supporting identification and capture of critical RDT&E funding

- Tailored intelligence on core technology gaps and requirements to position partners for direct government engagement with those working to fill those gaps with required technology solutions.
- End-to-end support throughout the entire lifecycle, including developing technical white papers, identifying appropriate contract vehicles, and ensuring funding remains secure through the funding and appropriations process.

Contact

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Composites Automation, LLC

Emergency Repair of Ship Hull Penetrations

ADVANCED/ADDITIVE MANUFACTURING

Problem Statement:

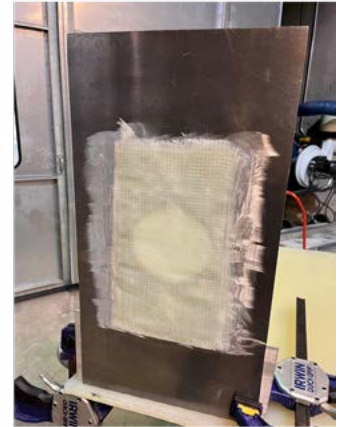
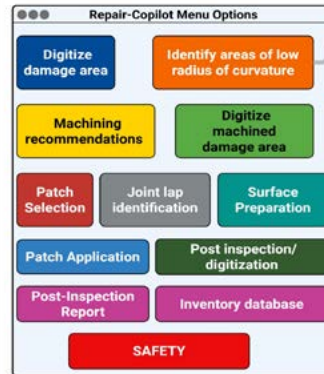
Several past incidents (e.g., collisions, fires, drone/missile hits, and general material failure) have created hull penetrations and structural failures where internal structural repairs are required on an immediate basis. A cost-effective repair system is required that is convenient to store, can be easily applied to a variety of surfaces, and allow original function of the metallic structure or component. The primary purpose of the repair allows the ship to safely return to a destination where a more permanent repair is possible.

Technology Solution Statement:

A glass UV prepreg repair approach allows emergency structural repair of Navy ship hull penetrations. The UV composite patches enable non-refrigerated storage with rapid application (metal surface prep, patch install, UV-cure) to meet 60 minutes repair time with consistent structural performance. Co-Pilot software will be developed to guide Navy personnel through repair process (patch dimensions and layup, surface, hole and adhesive application details, and the metal to composite joint configurations) that satisfies the Navy load requirements.

Benefits Statement:

The UV solution repairs irregularly shaped openings and restores the environmental integrity of the space. Repairs are designed to survive several pressure requirements (wave slap & weapon blast) while meeting in-plane structural stress levels of aluminum/steel structures. Repair work requires minimal surface preparation for repairs up to 4' diameter holes from missile or drone penetration. The UV-resin technology meets Navy Fire, Smoke, and Toxicity (FST) standards.



Contact

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DIT-MCO International Agile Cable Repair System (ACRS)

ENERGY, ENVIRONMENTAL, HEALTH, AND SAFETY

Problem Statement:

Enable mission continuity by repairing catastrophically damaged shipboard cabling while the ship is underway at sea, without reliance on full technical documentation or specialized personnel.

Technology Solution Statement:

DIT-MCO's Agile Cable Repair System (ACRS) provides a rapid, reliable solution for emergency cable and harness repair using prefabricated custom cable lengths, simple hand tools, and two integrated handheld testing devices for immediate verification of repair integrity.

The system is specifically designed for ease of use, allowing any shipboard personnel—regardless of technical background—to identify, repair, and validate damaged cabling. Clear, step-by-step instructions and an included instruction manual ensure that repairs can be completed quickly and correctly, even under high-stress, at-sea conditions.

Benefits Statement:

Emergency repairs can be executed without requiring traditional cable documentation such as wiring diagrams, schematics, or wire lists. The ACRS is highly user-friendly and self-contained, enabling any crew member to confidently diagnose, repair, and restore functionality using the included tools, handheld testers, and guided instructions—eliminating dependency on specialized training or personnel.



Contact

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Eddyfi Technologies

Internal Wall Thickness Mapping Pipe Crawler

ENHANCED INSPECTION

Problem Statement:

Navy personnel do not have the ability to inspect internal piping visually or quantitatively utilizing NDT.

Technology Solution Statement:

The VT-Y200 system is capable of inspecting internal piping utilizing ultrasonics, pulsed eddy current, and a pan/tilt camera. The Y200 system utilizes a rotate actuator on the front of the crawler to rotate and deploy probes on the internal diameter of the pipe wall.

Benefits Statement:

The ability for sailors to quickly understand piping integrity without removing lagging or cutting pipe allows time and money savings.

Contact

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ENFASCO, Inc.

Adhesive Mounted Voyage Repair Kit

CBM+/PREDICTIVE MAINTENANCE

Problem Statement:

Shipboard repairs at sea utilizing welding are often challenging and risky due to burdensome hot work, fire watches, and equipment set-up.

Technology Solution Statement:

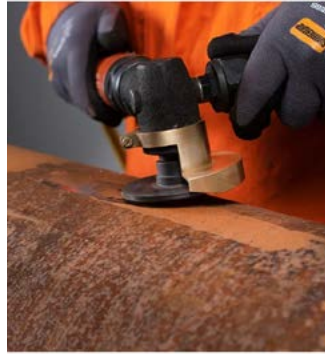
ENFASCO's adhesive mounted Voyage Repair Kit eliminates the risk of shipboard fires by utilizing structural adhesive with self-fixturing studs, standoffs, and tie downs to secure berthing during a casualty event, HEPA and water filters without welding, run emergency lighting, and many other possibilities without hot work and fire watches

Benefits Statement:

Utilizing ENFASCO's Voyage repair kit allows quick and durable ship repairs and equipment installations without gas-freeing, hot work, or fire watches. ENFASCO's comprehensive kit is easy to use and includes a variety of solutions.

Contact

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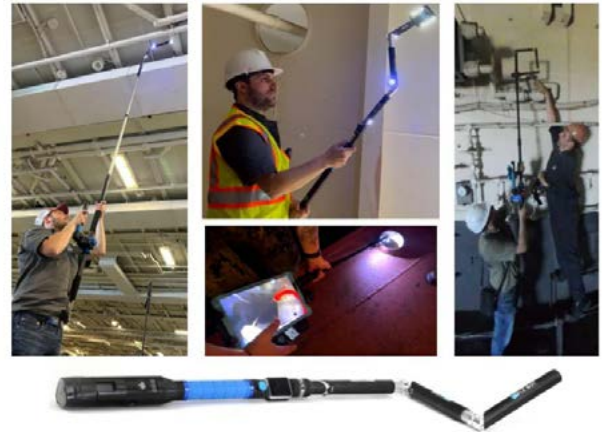
FLX Solutions

FLX BOT: Accelerated Inspection & Repair Robotic System

ENHANCED INSPECTION

Problem Statement:

Naval vessels and shipyard facilities contain countless hard-to-reach spaces (i.e. hull voids, tanks, piping systems, structural cavities, and elevated structures) that are inaccessible without disassembly or Confined Space Entry (CSE). Whether during Battlefield Damage Assessments (BDA) or routine maintenance and QA operations, traditional inspection methods are slow, dangerous, and reliant on personnel entering hazardous spaces or performing time-consuming teardowns. This delays return-to-mission timelines, drives maintenance cost overruns, and puts Sailors and shipyard workers at unnecessary risk.



Technology Solution Statement:

The FLX BOT is a handheld, 360° articulating snake-like robot just 1 inch in diameter, which is 3D5x smaller than any competing system. It solves the “last meter” inspection problem by navigating complex, confined spaces without disassembly, ladder/scaffolding setup or Confined Space Entry, delivering real-time data wherever it is needed most.

Rapidly swappable end effectors including 360° 4K cameras, ultrasonic NDT sensors, thermal cameras, acoustic microphones, and 3D mapping tools, deliver the right sensor payload into previously inaccessible locations to assess structural integrity, corrosion, leaks, and damage extent in real time.

Equally effective for Battlefield Damage Assessment, shipbuilding QA, corrosion inspection, and routine maintenance, FLX BOT is a versatile, grab-and-go supertool for any hard-to-reach space. It is handheld or pole-mounted, deploys in minutes with little to no training, fits in a briefcase, is battery-operated, and requires no network infrastructure. It is purpose-built for both shipyard and expeditionary environments.

Benefits Statement:

- Demonstrated 90% reduction in inspection time in U.S. Navy pilots
- Eliminates Confined Space Entry risk across BDA, maintenance, and QA operations
- Provides real-time visual, thermal, and NDT data to support faster return-to-mission decisions
- 60-unit Navy field trial order approved
- Deployed at Ingalls Shipbuilding for QA (paid for itself within the first month)
- Supports Level 1 & 2 corrosion assessments, structural damage triage, and 3D mapping for digital twins
- Active Air Force D2P2 SBIR for aircraft wing fuel tank inspection and FOD detection
- Performs in areas inaccessible to humans including at heights, reducing ladder and scaffolding dependency
- Priced at a fraction of comparable robotic systems

Contact

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Flyability

Flyability Elios 3 Drone with UT Payload, Tether and Gas Sensor

ENHANCED INSPECTION

Problem Statement:

Industrial inspections in confined, hazardous, and hard-to-reach environments—such as ships, ballast tanks, cargo holds, and stacks—are traditionally time-consuming, costly, and dangerous. These inspections often require human entry, scaffolding, rope access, or shutdowns, exposing workers to significant safety risks including falls, toxic environments, and limited visibility.

Additionally, traditional inspection methods frequently produce incomplete or low-quality data due to restricted access, poor lighting conditions, and the inability to reach critical areas. This results in inefficiencies, delayed decision-making, increased downtime, and higher maintenance costs.

Organizations need a solution that can safely access confined spaces, capture accurate and comprehensive inspection data, and reduce operational disruption—without putting human lives at risk.

Technology Solution Statement:

The Elios 3 provides a safe, efficient, and data-driven drone for inspecting confined and hazardous environments without requiring human entry. Designed with a collision-tolerant cage and advanced stabilization sensors, the Elios 3 can navigate complex, GPS-denied areas such as tanks, tunnels, and industrial facilities.

Equipped with high-resolution cameras, powerful lighting, and LiDAR-based 3D mapping technology, the drone captures precise visual and spatial data in real time. This enables inspectors to identify defects, assess structural conditions, and generate accurate digital models without interrupting operations or exposing personnel to danger. The Elios 3 also includes payloads like gas sensing, radiation sensing, and non destructive testing (NDT) to capture up to 6



different types of data while flying.

By replacing traditional inspection methods with remote access, the Elios 3 significantly reduces safety risks, inspection time, and costs while improving data quality and decision-making.

Benefits Statement:

The Flyability Elios 3 delivers value by transforming how confined space inspections are performed:

- **Enhanced Safety:** Eliminates the need for human entry into hazardous environments, significantly reducing the risk of injury or fatality.
- **Reduced Downtime:** Enables inspections without shutting down operations, minimizing costly interruptions to production.
- **Lower Costs:** Decreases reliance on scaffolding, rope access, and large inspection crews, cutting overall inspection expenses.
- **High-Quality Data:** Captures detailed visual and LiDAR-based 3D data, RAD, UT, thermal and gas data, improving accuracy in defect detection and asset assessment.
- **Faster Inspections:** Completes inspections in a fraction of the time compared to traditional methods.
- **Improved Decision-Making:** Provides real-time

insights and digital models, allowing teams to act quickly and confidently.

Contact

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Hexagon US Federal 3D Vessel Pre & Post Blast Digitization Solution

ENHANCED INSPECTION

Problem Statement:

Naval vessels currently lack a standardized, scalable capability to rapidly digitize and assess structural conditions before and after blast or damage events. Without a pre-event digital twin baseline, decision-makers rely on incomplete data, delaying response time and increasing operational risk.

There is a critical need to pre-digitize all vessels, integrating ship drawings into Cyclone 3DR to create a complete digital twin. Current workflows are slow, manual, and unsafe, and lack the ability to overlay pre/post conditions or isolate key structural components.

A solution is needed that enables rapid capture, simple operation by Sailors, and near real-time sharing to remote decision-makers.

Technology Solution Statement:

Leica BLK2GO, BLK ARC, and BLK360 G2 provide lightweight, rapid LiDAR scanning for vessel digitization. Pre-event scans create digital twins, while post-event scans capture damage conditions.

Cyclone REGISTER 360 PLUS automatically registers scans, and Cyclone 3DR enables heat map comparison, object classification, and change detection.

Reality Cloud Studio (RCS) allows near real-time sharing of data to remote stakeholders, supporting distributed decision-making and future FedRAMP compliance.

The system is designed for ease of use by the lowest common denominator Sailor with minimal training.



Benefits Statement:

Enables rapid damage assessment and faster decision-making. Reduces risk by minimizing time in hazardous environments.

Provides visual heat maps of structural changes and allows filtering of key ship components. Supports fleet-wide digital twin strategy.

Reality Cloud Studio enables real-time collaboration, improving response efficiency. Easy to use, scalable, and operationally effective.

Contact

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Kongsberg Ferrotech

The Hullius Robotic System (Hull Inspection and Repair Robot demonstration for Improved Maintenance and Sustainment)

ADVANCED/ADDITIVE MANUFACTURING

Problem Statement:

Maintenance of vessels often requires that the vessel has to be dry-docked to be able to do proper inspections and repairs. Some activities can be done by diver intervention, with associated HSE risks and with limited repair and inspection technologies available as all work is performed in water.

Technology Solution Statement:

The Hullius Robotic System developed by Kongsberg Ferrotech is capable of performing robotized cleaning, inspection, weld repair/additive manufacturing and coating application on vessel hulls, without the need of dry docking. The system includes a habitat with a range of tools, all carried by a crawler system. When the robot has localized the defect on the hull, the habitat is placed across the area and a controlled gas-filled environment is established. All operations are performed inside this controlled habitat, meaning that standardized techniques and products can be used, even if the damage is under water. The full operations are also documented in detail, through sensors and cameras, and during the operation stakeholders can monitor the full process through an online system (if required). The operation can also be done without any input from outside, as all control of the System is from the crew on the vessel. The system can also be deployed from a supply vessel, serving all vessels in a fleet.



Benefits Statement:

By use of the Hullius Robotic System, inspection and repairs can be done without dry docking vessels. This will reduce both cost, increase the repair quality and reduce HSE risk to divers. This system enables BDAR (Battle Damage Assessment and Repair) operations with vessels in forwarded positions, without the need of taking the vessel to a safe port.

This robotic system is a Dual-Use product, with application both within navy and also for Oil&Gas markets and the merchant fleet.

Contact

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LOKRING

Utilizing LOKRING fittings for Battle Damage Repairs outside of NAVSEA approvals

RELIABILITY IMPROVEMENT (HARDWARE)

Problem Statement:

NAVSEA MAF approvals are generally limited to 2" NPS and smaller. Battle damage to larger, high pressure piping systems critical to ship survivability and its ability to return to the fight currently have one repair option – welding.

Technology Solution Statement:

Using LOKRING Repair Couplings through 4" NPS will allow these critical systems to be repaired reliably, quickly and without welding.

Benefits Statement:

Using LOKRING high pressure Repair Couplings in sizes 2"- 4" will allow the Navy to repair systems like steering gear hydraulics, CPP, HP air and valve actuation hydraulics. These fittings utilize the proven LOKRING ESP metal-to-metal, fire hard seal technology. Paired with current NAVSEA approved fittings that are carried as onboard spares on several ship classes including CVN, DDG51, DDG1000, CG, AOE, LHA, LHD, TAKE, LSD and LPD (reference AEL 480000023 and 480000024) these larger fittings will allow BDR teams to reliably repair critical piping systems in a timely, efficient and safe manner.

Current NAVSEA LOKRING approvals:

- CN200/CN700 – ¼" NPS – 2" NPS
- CN3300 – ¼" OD tubing
- SS3300 – ¼" NPS – 1-1/2" NPS (approved for use on SS & CS pipe)
- SS3300 – ¼" OD – ¾" OD tubing



Contact

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Mactech, Inc.

Field Machining Repair “Shop in a Box”

RELIABILITY IMPROVEMENT (HARDWARE)

Problem Statement:

Something in the field requires precision machining to bring it back to working conditions, and cannot be brought to a machine shop, or the time it would require to bring into a machine shop is too great.

Technology Solution Statement:

Mactech designs and develops and trains on field machining equipment to bring to your site. Working with NAVSEA, we created a custom “Shop-In-A-Box” conex box of field machining equipment for battle preparedness field machining needs.

Benefits Statement:

Quicker machining solutions for naval fleets to return to action rather than returning to port for a fix.

Contact

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Marine Offshore Management (MOM)

MOM SPS Rapid Repair Kit

RELIABILITY IMPROVEMENT (HARDWARE)

Problem Statement:

Naval assets are frequently exposed to structural degradation due to corrosion, fatigue, impact damage and in extreme cases, battle damage. Conventional repair methods typically require hot work, dry docking or specialist shipyard intervention resulting in significant operational downtime, increased safety risks, and high logistical burden.

In remote or at-sea environments, the ability to execute timely and effective structural repairs is limited, reducing asset availability and mission readiness. There is a critical need for a rapid, safe, and deployable structural repair solution that can be implemented without reliance on shipyard infrastructure.

Technology Solution Statement:

Marine Offshore Management's (MOM) SPS Rapid Repair Kit uses Sandwich Plate System (SPS) technology. A steel-elastomer system of two steel plates bonded with a polyurethane core for high-performance structural repair.

The compact, modular kit is designed for rapid deployment, allowing ship crews or trained personnel to carry out repairs anywhere, including at sea. SPS is a cold-work solution, removing the need for hot work permits and reducing fire and safety risks.

It restores structural strength, stiffness, and fatigue performance while being immediately load-bearing, and is suitable for corrosion, cracks, impact damage, and fatigue-related failures.

The system is supported by:

- Pre-engineered, standardized repair procedures
 - Embedded QA/QC processes
 - Optional remote engineering oversight
- SPS has over 30 years of proven use across maritime,



offshore, infrastructure, and building sectors, including evaluation in naval applications.

Benefits Statement:

The SPS Rapid Repair Kit delivers faster, safer, and more efficient structural repairs with reduced weight and material usage. It minimizes operational downtime, supports remote and expeditionary repair scenarios, and extends asset life. As a mature, proven technology, it offers a low-risk, sustainable, and cost-effective alternative to conventional repair systems.

The MOM SPS Rapid Repair Kit delivers significant operational, technical, and commercial advantages:

- **Rapid Deployment:** Compact, site-ready solution enables immediate response to structural damage
- **Operational Continuity:** Repairs can be conducted without interrupting mission-critical operations
- **Improved Safety:** Cold-work application removes hot work risks and associated permits
- **Enhanced Structural Performance:** Restores strength, stiffness, and fatigue life with immediate load-bearing capability
- **Versatility:** Applicable to corrosion, cracks, fatigue, and impact damage with scalable repair configurations
- **Logistical Efficiency:** Lightweight, modular design reduces transportation and resupply burden
- **Repeatability & Quality:** Standardized procedures ensure consistent, high-quality outcomes
- **Proven & Low Risk:** Over 30 years of global application across multiple sectors
- **Sustainability:** Reduced material usage, lower embodied carbon, and extended asset life

The technology enables at-sea and remote structural repair capability, significantly improving asset availability, resilience, and lifecycle cost efficiency.

Contact

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MES Life Safety / Holmatro

Enhanced Shipboard Rescue Capability: Holmatro & Omni Shore Forced Entry Solutions

RELIABILITY IMPROVEMENT (HARDWARE)

Problem Statement:

The Navy requires an improved capability to rapidly breach and access damaged watertight doors during emergency rescue operations. Current rescue tools lack the force output, adaptability, and reliability needed to effectively operate in confined shipboard environments, resulting in delays that can compromise crew safety and damage control efforts.

Technology Solution Statement:

Holmatro rescue tools, paired with Omni Shore stabilization systems, provide the Navy with a purpose-built solution for breaching damaged watertight doors in shipboard environments. Holmatro's hydraulic cutters, spreaders, and rams deliver high-force output in compact form factors optimized for confined spaces, while Omni Shore components provide the bracing and stabilization needed to maximize tool effectiveness against resistant door structures.



Benefits Statement:

Holmatro rescue tools and Omni Shore systems offer the Navy faster forced entry on damaged watertight doors, reducing rescue response time and improving crew survivability. The tools' compact design and high force-to-weight ratio make them well-suited for the tight spaces common aboard naval vessels. Combined with Omni Shore's adaptable shoring solutions, this system provides damage control teams a reliable, field-proven capability that enhances mission readiness and sailor safety.

Contact

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MilTech at Montana State University NESAR REPTX Process Analysis and Auditing

BUSINESS IT & ANALYTICS

Problem Statement:

NESAR is aiming for the most efficient, scalable processes for discovering, evaluating, and validating commercial naval repair technologies under realistic operational conditions. Previous approaches have resulted in slow technology adoption, incomplete market coverage, and acquisition decisions made without comprehensive performance data or standardized evaluation criteria.



Technology Solution Statement:

MilTech's support will help NESAR implement an end-to-end REPTX capability that combines automated market scanning and technology ranking, standardized process execution through a publishable playbook, and rigorous field testing of up to technologies in realistic scenarios, all supported by continuous process improvement and stakeholder coordination frameworks.

Benefits Statement:

MilTech's support accelerates naval technology acquisition by providing acquisition-ready documentation based on objective performance data from operational conditions, maximizes vendor participation through comprehensive market coverage, and establishes repeatable, efficient processes that increase NESAR's capacity to rapidly identify and adopt technologies that enhance fleet readiness and repair capabilities.

Contact

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Nabors

PRIME H2

ENERGY, ENVIRONMENTAL, HEALTH, AND SAFETY

Problem Statement:

Operations remain highly dependent on diesel fuel for reliable electrical power. This reliance creates significant operational challenges, including high fuel logistics and transportation costs, vulnerability of fuel supply chains, exposure to price volatility, and increased operational risk in contested or remote environments. Additionally, diesel generation contributes to emissions, noise, and maintenance burdens that conflict with Navy energy resilience, sustainability, and force protection objectives. Alternative power solutions are needed that can substantially reduce diesel consumption while maintaining dependable, longduration, and dispatchable power for critical missions without increasing operational complexity or risk.

- Reduced Fuel and Logistics Burden: Eliminates or significantly reduces diesel fuel consumption, transport, and onsite fuel storage requirements.
- Safe, SolidState Energy Storage: Utilizes metal hydride batteries for lowpressure, inherently safer hydrogen storage compared to compressed or liquid hydrogen systems.

Contact

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Technology Solution Statement:

PRIME H2 is an integrated, modular energy generation and storage system that combines onsite solar power generation, hydrogen production, and metal hydride-based hydrogen storage to provide resilient, lowemissions electrical power. The system converts renewable electricity into hydrogen, stores energy safely in solidstate hydride batteries, and reconverts hydrogen to electricity on demand, enabling longduration, dispatchable power without reliance on fuel deliveries or the electrical grid.

Benefits Statement:

- LongDuration Energy Storage: Enables multiday to seasonal energy storage using hydrogen and metal hydride batteries, overcoming the limitations of conventional lithiumion systems.
- Energy Resilience and Reliability: Provides continuous power independent of grid availability, fuel supply chains, or weather variability.

Neothane Magnaseal Line of Products

RELIABILITY IMPROVEMENT (HARDWARE)

Problem Statement:

The rapid containment of hazardous or non-hazardous leaks in complex, high-risk maritime environments is a critical and persistent challenge. Current leak response methods often rely on time-intensive, equipment-heavy, or multi-step solutions. Often multiple responders are also required. These limitations can delay containment, increasing the risk of:

- Crew exposure to dangerous situation, including hazardous materials
- Escalation of onboard damage
- Operational downtime and compromised mission capability
- Environmental contamination

The Magnaseal Boom Magnet specifically lends dependability and grip when applied to the hull of a ship, replacing products that often need to be reattached frequently.

Naval damage control teams require solutions that can be deployed immediately, adhere reliably under adverse conditions and function with minimal manpower and training.

Technology Solution Statement:

The Magnaseal Leak Patch combines the strength of neodymium magnets with the flexibility and chemical resistance of urethane to deliver a rapid, reliable, reusable solution. Naval damage control teams can respond instantly to hull breaches, pipe failures, and hazardous material leaks, even in wet, corrosive and dynamic conditions. The Magnaseal will grip tightly to stay in place, with the ability to flex concavely or convexly. Once applied to the hull of the ship, the Magnaseal Boom Magnet will stay in place, without sliding down or easily becoming dislodged.



Benefits Statement:

- The magnetic grip of the Magnaseal comes from the great number of magnets in each product (varying with size of product)
- The unique design of the magnets allows for flexibility
- The specific qualities of the urethane allow for chemical resistance when in contact with common chemicals
- Magnaseal can be employed quickly and will adhere instantly to ferrous surfaces
- Durable construction allows conformity to irregular or damaged surfaces
- Ease of application allows for minimal manpower to mitigate the situation
- Once the situation is under control, the Magnaseal Patch and Boom Magnet can be removed, deconned, and used again
- The Magnaseal line of products are quick, and reliable, improving safety for damage control teams, minimizing environmental impacts and mitigation costs

Contact

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NOV / DXP

Bondstrand FRP Piping

COATINGS AND CORROSION PREVENTION

Problem Statement:

Corrosion of metallic piping systems is prevalent in marine piping systems.

Technology Solution Statement:

The goal is to provide the US Navy with quality FRP piping that can be used onboard vessels to enhance corrosion resistance and provide significant weight savings.

Benefits Statement:

Bondstrand FRP piping is lightweight, requires minimal maintenance, and is highly durable/corrosion resistant. This piping system is ideally suited for harsh environments, in particular marine and offshore applications.

Contact

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Fiber Glass Systems



OKSI

Autonomous Draft Determination - RAPIDD

ENHANCED INSPECTION

Problem Statement:

Current method for checking the draft of a ship is to send Navy teams on a small boat to go around the ship and check and report draft measurements.

Technology Solution Statement:

RAPIDD will provide the Navy with a turn-key hardware, software, and algorithm solution stack for unmanned image-based draft determination under various weather conditions using real-time image processing.

Benefits Statement:

Decreased time to perform draft determination on Navy vessels and increased safety of Navy teams performing draft determination measurements.

Contact

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Penn State Applied Research Lab / HAMR Industries / Solvus Global Expeditionary High Pressure Cold Spray Repair

ADVANCED/ADDITIVE MANUFACTURING

Problem Statement:

Corrosion damage to Department of War (DoW) assets leads to costly and prolonged repair schedules when relying only on traditional manufacturing and repair technologies.

Technology Solution Statement:

Cold Spray is a process which uses compressed and heated gas to accelerate solid metal and ceramic particles to a sufficient velocity to cause the particles to deform and create a mechanical bond upon impact with a substrate or previously deposited powder particles.

Benefits Statement:

Cold Spray excels in applications where non-structural dimensional restoration is required, including sealing surfaces such as flanges, o-ring grooves, valves, and inner/outer diameter shaft repairs. The Cold Spray process is performed at temperatures that do not cause warping and deformation of the substrate, resulting in repairs that do not require excessive rework or heat-treatment after the repair is completed.

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Rosebank Engineering Pty Ltd. / Centerline (Windsor) Ltd. Low Pressure Cold Spray Repair

ADVANCED/ADDITIVE MANUFACTURING

Problem Statement:

Cost of corrosion and impacts to platform availability resulting from maintenance and repair are critical degraders of Defence capability. Removal of damaged components for repair is often impractical, costly and time-consuming.

Technology Solution Statement:

Rosebank Engineering delivers a mature, combat-relevant Cold Spray sustainment capability that restores mission-critical assets while reducing replacement cost and improving platform availability. Field-portable Cold Spray sustainment offers:

- Low infrastructure footprint, high portability, with high process stability.
- Precision, repeatable, certifiable deposition control.
- Proven in-field aerospace repairs
- Facility-based and deployable sustainment models supported

Benefits Statement:

- Rosebank Engineering delivers a mature, combat-relevant Cold Spray sustainment capability that restores mission-critical assets while reducing replacement cost and improving platform availability.
- Certified processes, operational experience, and secure facilities position Rosebank as Australia's leading Defence Cold Spray sustainment provider.
- Rosebank is ready to support US Navy and allied forces operating in the Indo-Pacific region with certified Cold Spray repair services, deployable sustainment models, and robust logistic support frameworks.



Contact

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Schemata

Schemata 3D Battle Damage Scanning and Visualization Platform

WORKFORCE DEVELOPMENT/VISUALIZATION

Problem Statement:

Battle damage assessment on naval vessels currently relies on manual visual inspection, 2D photography, and handwritten notes to document damaged spaces. In contested maritime environments, assessment teams must work quickly in hazardous, structurally compromised compartments with limited visibility and access. Traditional documentation methods produce incomplete records that are difficult to share with remote engineering teams, slowing the development of repair courses of action. Without a comprehensive 3D record of damage conditions, ashore response teams and repair planners lack the spatial context needed to accurately scope repairs, determine contracting methods, and prioritize restoration of combat capability.

Technology Solution Statement:

Schemata provides an AI-powered 3D scanning and visualization platform that enables Battle Damage Assessment Teams (BDATs) to rapidly capture damaged ship compartments using portable cameras and LiDAR sensors and reconstruct them as photorealistic, navigable 3D environments. The platform uses Gaussian splatting to generate high-fidelity digital representations of blast-damaged spaces within hours of capture. These 3D reconstructions are accessible through any standard web browser, allowing remote SMEs, ashore response teams, NAVSEA engineers, and repair planners to virtually walk through damaged compartments, assess structural deformation, and collaborate on repair courses of action without being physically on scene. The system supports annotation, measurement, and side-by-side comparison of pre- and post-damage conditions to accelerate scope-of-work development and contracting decisions.

Benefits Statement:

Schemata's platform reduces the time from damage assessment to an actionable repair plan by providing ashore response teams with immediate, spatially accurate 3D documentation of damaged compartments. Remote SMEs can assess damage without deploying to the vessel, reducing personnel exposure to hazardous conditions and enabling parallel engineering analysis across multiple organizations (NAVSEA, RMC, FDSRT, civilian contractors). Browser-based access means repair planners, contracting officers, and EOC/NSIRC coordinators can review the same 3D damage record simultaneously from any location. For PBDE 2026, Schemata can demonstrate scanning across multiple exercise phases, capturing blast damage during at-sea response (Phase 2) through in-port BDA/R and tech demonstration (Phase 4), providing a persistent 3D record of the full repair kill chain.

Contact

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Sentient Industries | METEOR

METEOR Advanced Power System

ENERGY, ENVIRONMENTAL, HEALTH, AND SAFETY

Problem Statement:

Battlefield energy is fragmented, vulnerable, and unsustainable

001 Fragmented Architecture:

Units rely on a patchwork of GOTS and COTS generators with no unified energy management framework. GOTS systems are oversized for specific applications, operating below optimal efficiency and wasting fuel. COTS alternatives introduce gasoline dependency that conflicts with JP8/JP5 logistics standards. Neither category provides the scalable, right-sized energy storage and conversion capability between 1 kWh and 90 kWh that the force requires.

002 Signature Vulnerability

Legacy generators produce acoustic, thermal, and electromagnetic signatures that are directly targetable—as demonstrated by adversary-targeted generator strikes in Ukraine. These signatures compromise the survivability of the warfighter, challenging silent watch operations and concealment in contested environments.

003 Logistics Burden

Current power systems demand constant fuel resupply convoys, dedicated transport vehicles, and specialized maintenance personnel. A 15 kW MEPS with trailer and prime movers weighs 10,000+ lbs and occupies 1,196 ft³, consuming mobility capacity that should carry mission payload. This places a continuous logistical burden on the sustainment and force protection of forward mobile operations.



004 No Intelligent Management

Energy distribution decisions are manual, reactive, and disconnected from operational planning. No automated load optimization, predictive maintenance, or energy-aware mission planning capability exists at the tactical edge, creating excess cognitive load and higher potential for error.

Technology Solution Statement:

Field-proven—not rebranded COTS
METEOR (TRL 8) is a hybrid modular power system with mission-tailored microgrid architecture delivering multi-capable (TMS compliant) power distribution that adapts to changing operational demands, dramatically reducing fuel consumption, maintenance burden, and force protection requirements maximizing warfighter survivability (eliminating enemy detection: no acoustic, thermal, ELINT signature). Hand-carry portable, METEOR integrates seamlessly with existing logistics classes and legacy generators, enhances mobility, and enables rapid point-of-need deployment with multi-source energy replenishment across all mission sets.

Benefits Statement:

Strengthens energy resilience, mission assurance and survivability in contested, degraded and disconnected environments. Speeds operations, and lessens force protection requirements with reduced logistical footprint, fuel, and maintenance burden-empowering warfighters to sustain dispersed missions in a wide range of environments with greater flexibility and security.

- Decrease Detection Risk
- Enhanced Concealment
- Counter Acoustic, IR, ELINT Threats
- Eliminate Detection by Smell
- Visual Threat Mitigation
- Speed to Movement
- Flexibility for Smaller Footprint
- Perfectly Size Power and Runtime
- Minimize Fuel Delivery Requirements
- Reduce Logistics Force Protection
- Extend Operational Range/Duration
- Eliminate Harmful Emissions
- Reduce Downtime & Maintenance
- Operator Has More Time on Target
- Adapt to Changing Mission
- Expand/Contract to Suit Mission

Contact

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Specialized Professional Services, Inc. (SPSI) **Magnaseal High Strength Leak Patch by NEOTHANE Inc.**

RELIABILITY IMPROVEMENT (HARDWARE)

Problem Statement:

Magnaseal Leak Patch can be used to stop pipeline or storage tank leaks under pressure. They can also help mitigate chemical and hazardous material releases. Works great with oil, gas, and hydrocarbon leaks. They can also help with water system losses and inefficiency. Most importantly, stop leaks on a ship's hull.

Technology Solution Statement:

The MAGNASEAL contains rare earth magnets encased in a chemically compatible material that can be easily applied to stop leaks.

Benefits Statement:

The MAGNASEAL leak patch conforms to the shape of the tank, piping to stop leaks instantly.

Contact

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Stata

Stata Fire-watch Smart Thermal Monitoring System

ENERGY, ENVIRONMENTAL, HEALTH, AND SAFETY

Problem Statement:

Hot work in shipyards and industrial environments creates a constant risk of incipient fire, missed combustibles, and safety non-compliance. Traditional fire watch methods rely heavily on continuous human observation, which can be inconsistent, labor-intensive, and difficult to maintain across large or obstructed work areas.

Technology Solution Statement:

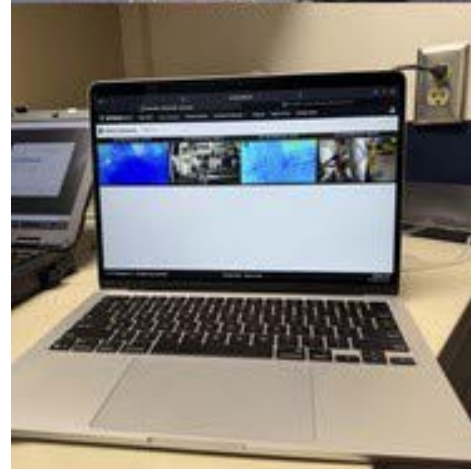
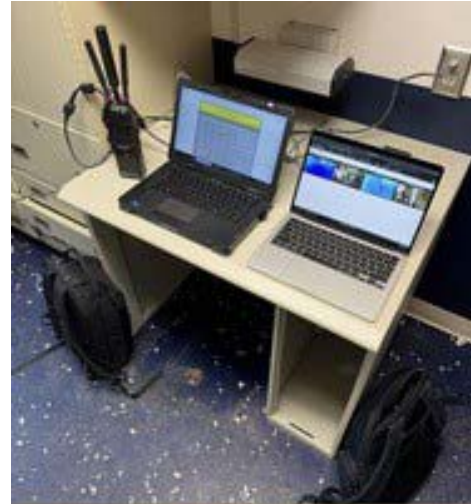
Stata Fire-watch is a smart thermal and optical monitoring solution designed to enhance fire watch operations during hot work. Using a combined thermal camera, optical camera, AI analytics, and two-way audio, the system helps identify abnormal heat signatures, detect potential fire risks, monitor personnel presence, and support situational awareness in real time through a cloud-based interface.

Benefits Statement:

Stata Fire-watch helps improve safety by providing earlier awareness of heat buildup and potential fire hazards while reducing reliance on manual-only observation. The system can support faster notification, better documentation, improved oversight of hot work areas, and more consistent monitoring in complex industrial and maritime environments.

Contact

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Sunrez Corp. Sunrez UV Curable Prepregs

COATINGS AND CORROSION PREVENTION

Problem Statement:

Corrosion, embrittlement, cracking and battle damage require prompt and cost-effective repair.

Technology Solution Statement:

The use of composites to provide structural reinforcement and repair without hot work and with a higher strength to weight ratio than steel is well known. Sunrez UV prepregs allow for minimally trained personnel to rapidly and effectively repair damage without the need for complicated procedures and long cure cycles. The materials are no VOC and non-hazardous for shipping, reducing costs and improving safety.

Benefits Statement:

Sunrez prepregs are easy to use, can be installed by shipboard personnel, are non-hazmat for shipping and storage, require no measuring or mixing of hazardous chemicals, operate well in a large range of temperatures, have an infinite working time and cure in minutes instead of hours. A repair can be done by two sailors in half a day that would take three days with current epoxy technology. Our patches have been used to repair tanks, decks and other structures made of steel and aluminum. Custom shapes and sizes of prepregs can be made for larger repairs.

Contact

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Titomic USA, Inc.

Titomic Kinetic Fusion™ (TKF)™ Cold Spray Additive Manufacturing COATINGS AND CORROSION PREVENTION

Problem Statement:

The United States Government spends over \$20 billion dollars a year on corrosion prevention, including maintenance, repairs and the total replacement of deteriorated infrastructure.

Technology Solution Statement:

Titomic USA, Inc. delivers advanced cold spray additive manufacturing solutions focused on dimensional restoration, and corrosion barrier coating of high-performance metal components without any thermal stress being induced on the base material.



Benefits Statement:

Titomic Kinetic Fusion™ (TKF)™ technology facilitates the rapid and low-cost restoration, coating, and full manufacture of an infinite variety of metallic components, facilitating sustainment activities via extending operational life and reducing functional downtime. Our technology enables unmatched coating thickness, adhesion strength, density, and corrosion resistance which allow our customers to maximize uptime and fleet availability to support the demanding missions of our Warfighters.

Contact

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TurnAround Factor SME Connect

ENHANCED INSPECTION

Problem Statement:

In operationally challenging environments, numerous situations arise where sailors and marines shipboard or at remote locations need engineering assistance or support from subject matter experts (SME). Flying out experts in these environments can be difficult and resource intensive, increasing equipment downtime and reducing operational readiness.

Technology Solution Statement:

SME Connect is an all-in-one solution that allows minimally-trained on-site users to interact with remote experts in an AR environment through devices such as an iPad or laptop device. On-site users provide remote access to diagnostic equipment and specialized tools that are in the field, which would otherwise be un-interbutable without a fly-out team.

Benefits Statement:

By using SME Connect's remote tools and AR capabilities, on-site users can receive better support and diagnostics by sharing voice, data, and video with remote experts in real-time. SME Connect enables the SMEs to get closer to the equipment in operation, to assist with triaging and prioritizing repairs. This saves valuable time repairing and maintaining equipment, reduces the costs of sending SMEs to location, and returns vital equipment to the fight faster in operationally challenging environments.

Contact

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University of Houston

twinfra: Digital Twinning Infrastructure

ENHANCED INSPECTION



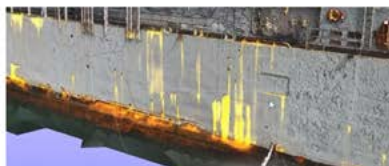
Platform and sensor agnostic



Ex-USS Tarawa engine room



Ex-USS Paul Foster reconstructed and visualized in twinfra



twinfra comes with AI models to detect and map defects such as corrosion



twinfra's change detection can be used to identify changes across scans

Problem Statement:

Inspecting and monitoring infrastructure damage is often slow, labor-intensive, and fragmented across multiple tools and data sources. Traditional workflows can take days to generate usable 3D models, make it difficult to see subsurface issues, and rely heavily on manual interpretation to identify and quantify defects such as corrosion and other damage.

Technology Solution Statement:

Twinfra is an open-platform, near real-time image-based 3D digital twin solution that couples accurate 3D reconstructions with fast analytics for large infrastructure assets such as ships or buildings in minutes. It works with any camera platform, and integrates multi-modal data with a universal hook, including thermography and time-of-flight measurements, and uses advanced AI to automatically detect, map, quantify, and analyze damage, equipment, and changes within a collaborative 3D viewing environment.

Benefits Statement:

Twinfra enables faster and more informed infrastructure assessment by drastically reducing digital twin creation time and automating damage detection and analytics. Twinfra can be beneficial for high-stakes applications such as battle damage assessment but also for routine maintenance and management. Its multi-modal and open-platform design supports advanced custom integration, and enhances collaboration for inspection, monitoring, and decision-making.

Contact

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Viega NA

Viega MegaPress® CuNi Press Connect Fittings (PCFs)

RELIABILITY IMPROVEMENT (HARDWARE)

Problem Statement:

The Navy loses a ship to fire, on average, once every seven years. More than 50% of shipboard fires are attributed to HOT Work. Bronze silver brazing is a specialty that requires years of training, constant recertification and typically has an 18% failure rate. Effecting repairs in less-than-ideal scenarios (battle damage) is difficult and strains resources.

Technology Solution Statement:

Viega LLC's MegaPress® CuNi, PCFs, are a SHOCK rated substitute for bronze silver brazed fittings. They offer rapid permanent connections that don't require HOT work, draining, cleaning, gas freeing and have a best-in-class success rate with near-zero failures. MegaPress® CuNi PCF's have NAVSEA approval for surface combatants and aircraft carriers and offers Battle Damage and Repair (BDAR) teams the emergent repair capabilities to pipe systems, increasing success rate while restoring operational status, faster and safer.

Benefits Statement:

- Non-welded option for pipe connections.
- Reduce RISK - eliminate HOT work, Fire Hazard/ Fire Watch and Chemist.
- Fast consistent connections - no gas freeing, draining or cleaning system (connect while wet).
- Commission on the first round (Eliminate typical 18% failure rate of Bronze silver brazing).
- 56% cost savings versus welded fittings (first installed costs not considering bad connections).
- 35% cost savings versus brazed fittings (first installed costs not considering bad connections).
- Battery operated handheld tools allow repairs in remote locations with limited services.
- Included in ships AEL (AEL 1-480260055).
- Additional sizes and materials available for non-permanent repairs.



Contact

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VRC Metal Systems

Cold Spray Deposition for Repair and Coating Services

ADVANCED/ADDITIVE MANUFACTURING

Problem Statement:

Repairing Navy hardware is critical to maintaining fleet readiness. Although welding, thermal spray, and plating are commonly used, there are many parts that these processes just cannot fix, and many more where these are not the most efficient or robust repair method. Specifically, welding has challenges with thin repair deposits, warping, cracking, and unweldable alloys. Thermal spray and plating both have limited material solutions and provide weakly bonded materials which can fail when stressed, limiting their utility to simple repairs and often are life limited.

Technology Solution Statement:

Cold spray technology can produce bond strengths of deposited materials significantly higher than those achieved through thermal spray and plating, in some cases approaching the strength of certain weld materials. Unlike welding, however, cold spray does not cause cracking and warping damage, and it eliminates metallurgical compatibility issues. VRC's cold spray delivers the highest quality cold spray in factory and shipyard environments as well as at the point of need, including applications performed on-ship without requiring total part removal. VRC's wide variety of material solutions also allow for everything from like-on-like material repairs to enhanced coatings designed to improve wear and corrosion performance.



Benefits Statement:

VRC enables repair of parts that otherwise could not be repaired and coating solutions that can extend service life beyond that of new parts by enhancing resistance to wear and corrosion.

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SAVE THE DATE

2026 CTMA Partners Meeting

Jacksonville, FL

September 22 - 24, 2026



Hyatt Regency Jacksonville Riverfront in Jacksonville, FL.

The 2026 Commercial Technologies for Maintenance Activities (CTMA) Partners Meeting is scheduled for September 22 - 24 at the Hyatt Regency Jacksonville Riverfront in Jacksonville, FL. This is a unique opportunity to engage with leaders from government, industry, and academia in a collaborative setting. It is the only DOW-wide forum focused on enhancing maintenance and sustainment capabilities, prioritizing innovations and strategies that enhance warfighter readiness.

This year's meeting will feature the return of evening table-top receptions and the CTMA

Technology Competition, providing ample opportunities for industry and academic partners to showcase next-generation technology solutions to a wide range of decision-makers across the DOW.

The CTMA Program unites the Department of War (DOW), industry, and academia to conduct technology demonstrations, evaluations, and validations. CTMA initiatives drive innovation in sustainment, tackle materiel readiness challenges, and modernize our organic industrial base.

**FOR DETAILS
PLEASE VISIT:**

[ncms.org/
events/2026-ctma-part-
ners-meeting/](https://ncms.org/events/2026-ctma-partners-meeting/)

