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Expeditionary Missions Consortium Crane (EMC²) | LEAN Power Network Industry Day

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Presented by: Mr. James (Jim) Caley (Col., USMC, Ret.)
Director of Operational Energy, Office of the Deputy Assistant Secretary of the Navy, Energy

Presented by: Dr. Lesley Wilhelm
Action Officer – Contested Logistics & Wargaming, Office of the Deputy Assistant Secretary of the Navy (RDT&E)

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LEAN Power Network

Logistics Energy and Access for Naval (LEAN) Power, in partnership with **Expeditionary Missions Consortium – Crane (EMC²)**, will address the growing need within the Navy for solutions to contested logistics, and resiliency challenges, particularly in the area of Operational Energy technology and Installation Energy infrastructure.

Technology Areas

- Contested Logistics
- Energy Resilient Micro Grids
- Improved Water Resilience
- Advanced Battery Technology
- Weapon System Performance
- Ship-Board Power and Propulsion
- Energy Training and Education
- Unmanned Persistence
- Industrial Control Systems and Operations Technology for Power Infrastructure and Weapons Systems Protection
- Supply Chain

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Agenda

- NSWC Crane Overview
  - Mission
  - Thrust Areas
- EMC² - LEAN Power Overview
  - Consortium Resources
  - How To Join
  - Engagement & Events
- Current and Upcoming Opportunities
  - Request for Information
  - Request for Solutions
- Broad Request for Solutions

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OUR MISSION & VISION

WHAT WE DO

Deliver **innovative solutions** and **readiness** to the **Nation** and its **Warfighters**

HOW WE DO IT

Advance all-domain system of systems within the Mission Areas of:

STRATEGIC MISSIONS

ELECTROMAGNETIC WARFARE

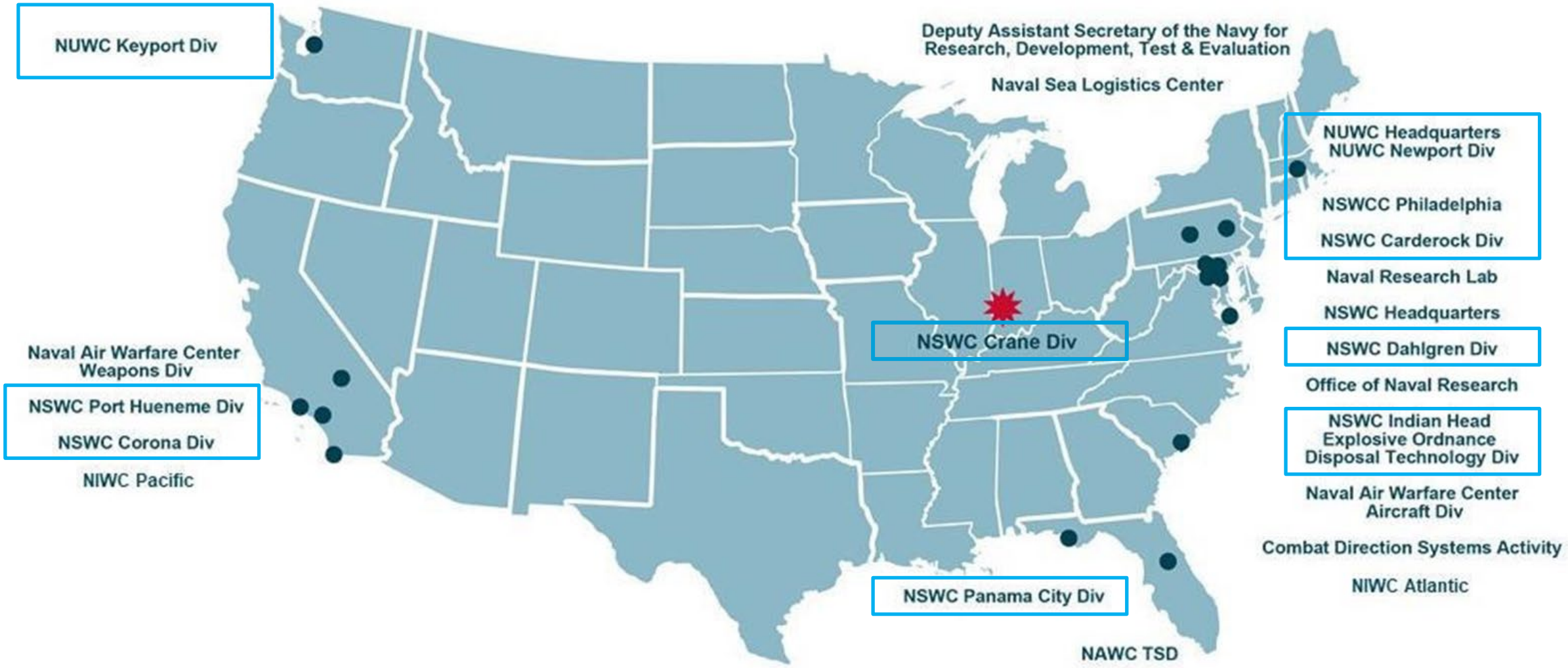
EXPEDITIONARY WARFARE

Conduct science and technology, research, development, test and evaluation, acquisition and in-service engineering

VISION

Combating our nation's greatest threats, NSWC Crane is the indispensable mission expert, leveraging our deep technical heritage to deliver solutions through innovation and strategic partnerships

NAVAL RESEARCH & DEVELOPMENT ESTABLISHMENT



Aggressive RESEARCH, DEVELOPMENT, TEST & EVALUATION for Reliable Real World Solutions.

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Mission

The **Expeditionary Missions Consortium – Crane (EMC²)** supports the Naval Surface Warfare Center, Crane Division under an Other Transaction Agreement (OTA) collaboration **to engage industry and academia to perform basic, applied, and advanced research projects, and prototype projects** in support of current and future needs related to Expeditionary Missions Technologies.

Strategic Thrust Areas

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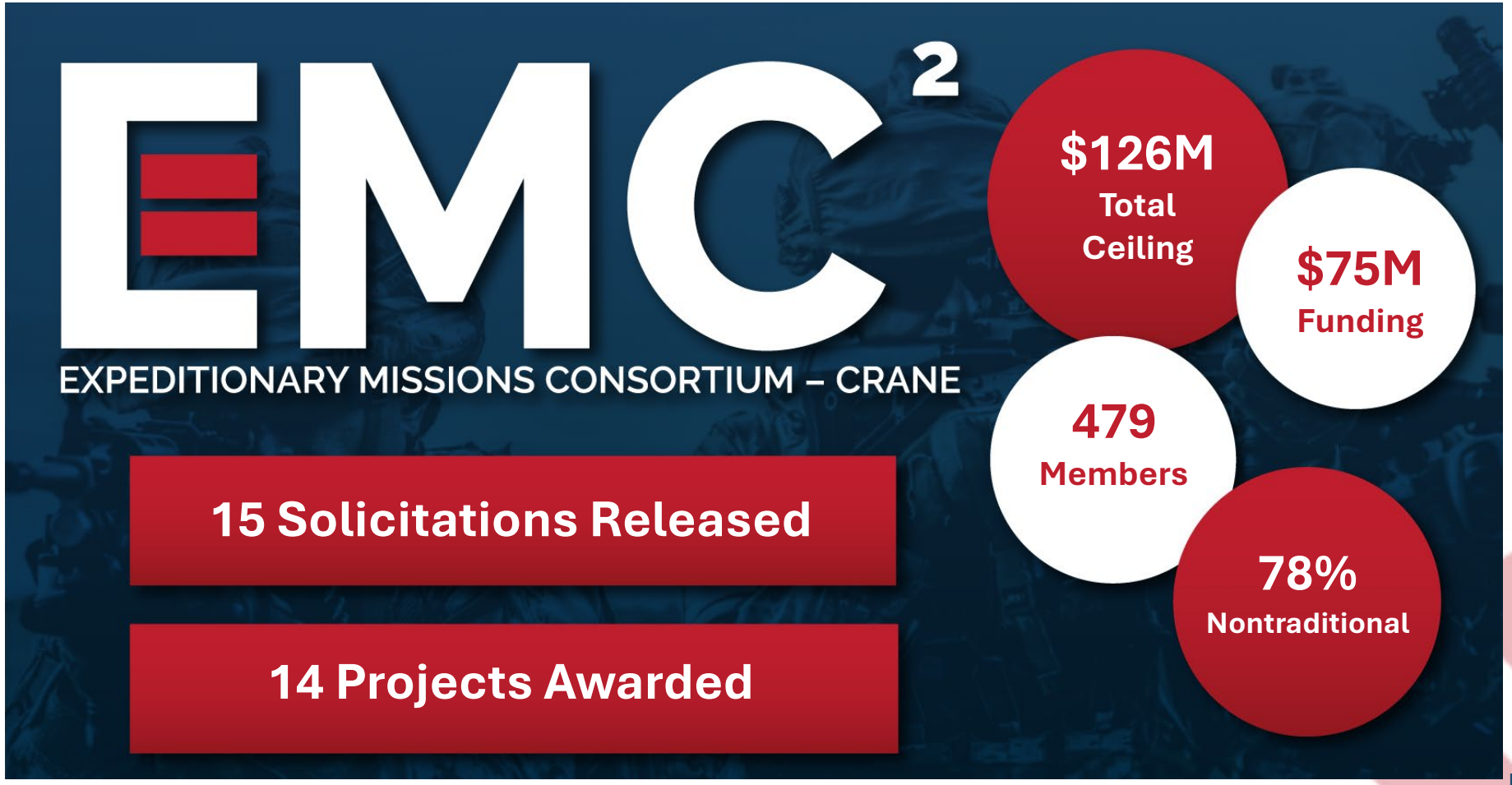
Key Points & Status



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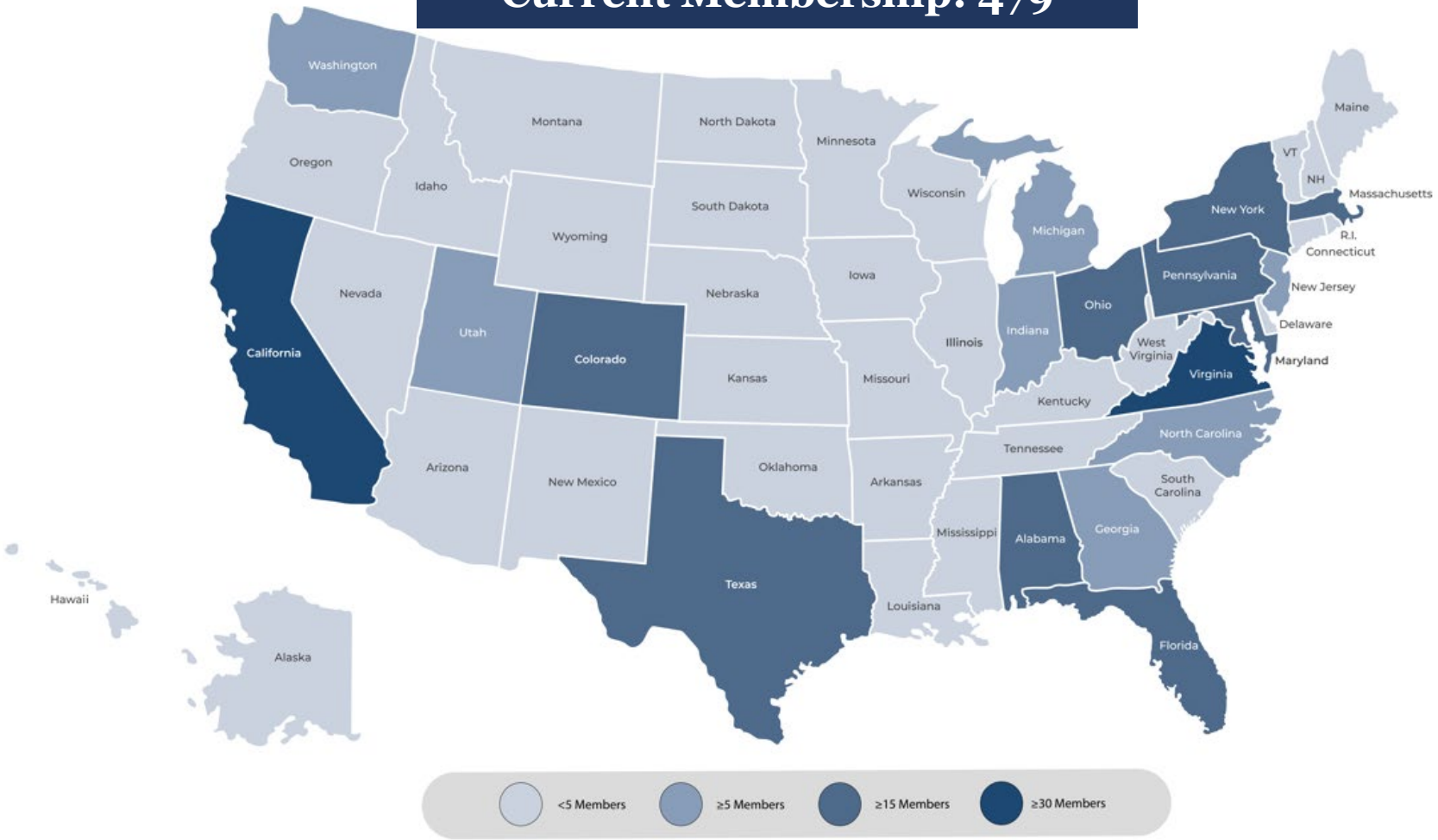
EMC² Membership Density

Current Membership: 479



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How to Join

emccrane.org

EMC² Membership Requirements

- Active JCP-signed DD2345 certification
- DCSA-approved mitigation plan OR signed Export Compliance Acknowledgement Form (if operating under FOCI)
- Comply with export control laws
- U.S.-based firm
- Not be barred or suspended from contracting w/ Gov't
- Contribute to EMC² Tech Areas

LEANPower.org

Network Application Process

1. Join EMC² (option on application to Join LEAN Power Network)
2. Once EMC² application approved, follow on email with additional LEAN Power requirements
3. Member submits LEAN Power application and Quad Chart
4. DASN Energy approves membership to LEAN Power Network

Visit us at Booth 306 to learn more!

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EMC² & LEAN Power Consortium Benefits

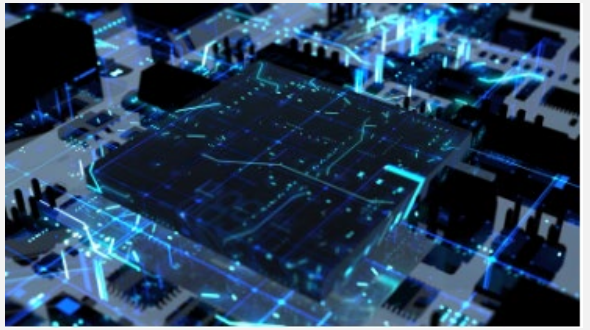
Collaboration

Fosters collaboration between Government, Industry, and Academia to build a robust, resilient **defense industrial base**

Innovation

Enables **rapid research, access to commercial solutions** for defense requirements, and innovations from industry, academia, and non-traditionals.

Funding



Minimizes barriers to entry for **small, non-traditional businesses** to work with the Government, and access research and prototyping teaming opportunities.

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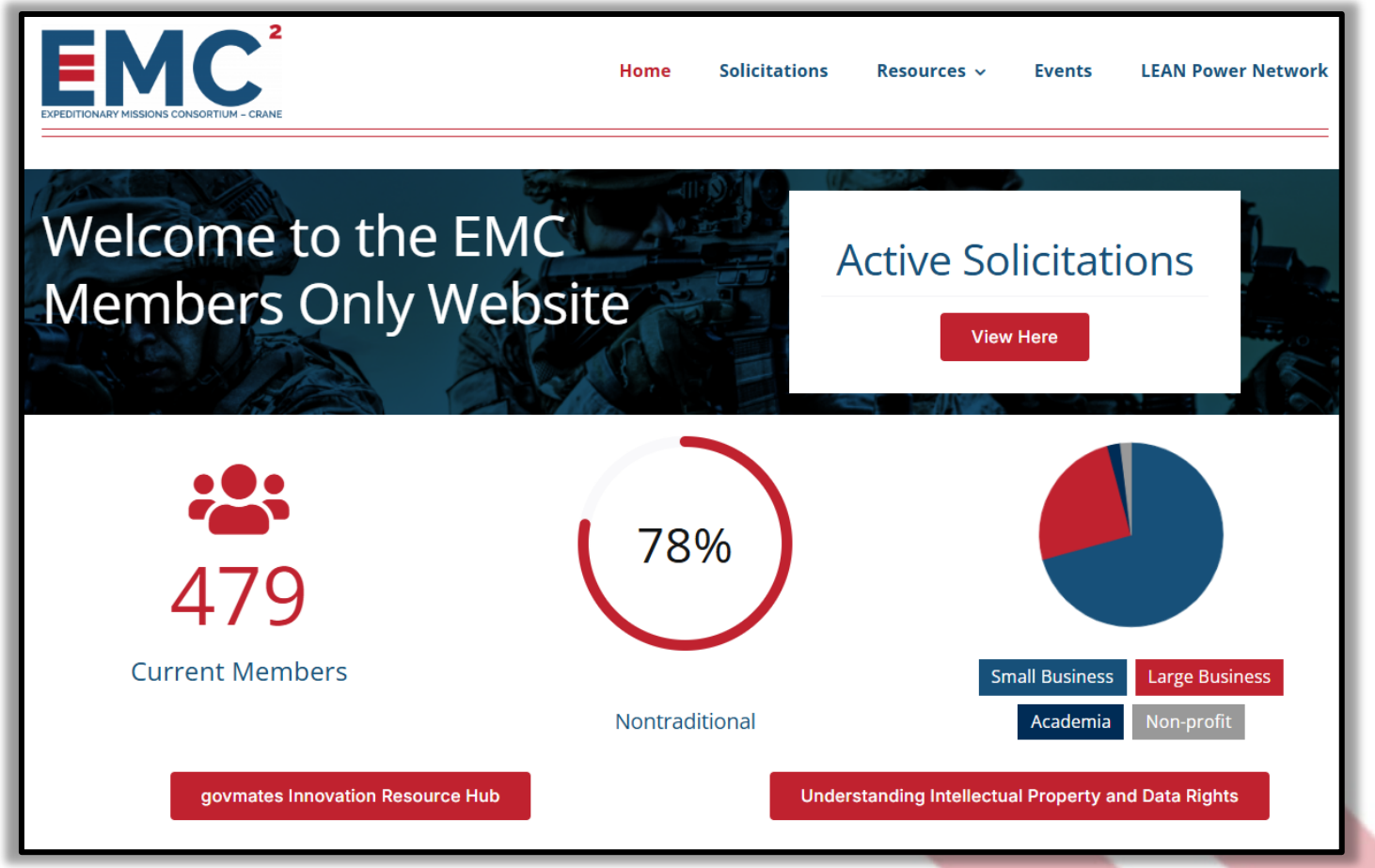
Members Only (MO) Site

- Access to active Solicitations and RFIs
- Member Collaboration Database
  - Networking tool to partner with other companies
  - Search companies by Technical Capabilities and Expertise
  - Used by Government for Market Research
- Valuable Resources and Tools



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EMC² Membership Engagement Events

- **Speed Networking (Virtual | Every 2–3 Months)**
  - **Industry → Industry** focus
  - Builds collaboration & teaming opportunities
  - Showcases small business capabilities and allows large businesses to discover future teaming efforts
- **Industry Days (In-person | Annual)**
  - **Government → Industry** focus
  - Government presents mission priorities & upcoming requirements
  - Helps members align capabilities with future needs
- **Reverse Industry Day (Virtual | Annual)**
  - **Industry → Government** focus
  - Members present capabilities, innovations & solutions
  - Helps inform government planning & partnership opportunities
- **Conferences and Symposiums**
  - TechConnect Events
  - Sea Air Space 2026: 19-22 April 2026
  - Modern Day Marine: 28-30 April 2026

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Exhibit Hall

Technical Representatives from NSWC Crane and DASN Energy will be at the EMC²/LEAN Power Booth from 2:00 – 4:00!

Visit us at **Booth 306** to learn more!

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Questions?

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Why an OTA?

What is an OTA (Other Transaction Authority)?

- A **flexible acquisition tool** enabling fast delivery of innovative **research and prototypes** to the Federal Government.
- Not bound by traditional Federal Acquisition Regulations (FAR).

Why the Government Uses OTAs

- Encourages **open communication** between industry and government.
- **Accelerates acquisition** of critical technologies.
- Engages a **diverse pool** of traditional and nontraditional suppliers.
- Enables **faster contracting** through long-term agreements with modifiable terms.
- Drives **competition and innovation** across the U.S. economy.

Benefits for Industry

- Faster, more agile path to government contracts.
- Direct, ongoing collaboration with government stakeholders.
- Broader access to funding and innovation opportunities.

The OTA model provides flexibility for better Government/Industry collaboration.

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EMC² RFI: Industry Abusive Test Capability for Lithium Batteries

Presented by: Jason D. Leonard, Chief Engineer
Power and Energy Systems Division, NSWC Crane

CAPT Rex Boonyobhas, USN
Commanding Officer

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Dr. Angie Lewis, SES
Technical Director

Statement of Need (SON)

- The DoW is seeking information from industry on the capabilities available for the abusive testing of lithium batteries. Capabilities of interest include cell, module, and battery propagation testing (full casualty), heat release rate testing, gas analysis, and environmental testing.

- Goal is to supplement existing organic T&E capabilities at both NSWC Crane and Carderock.

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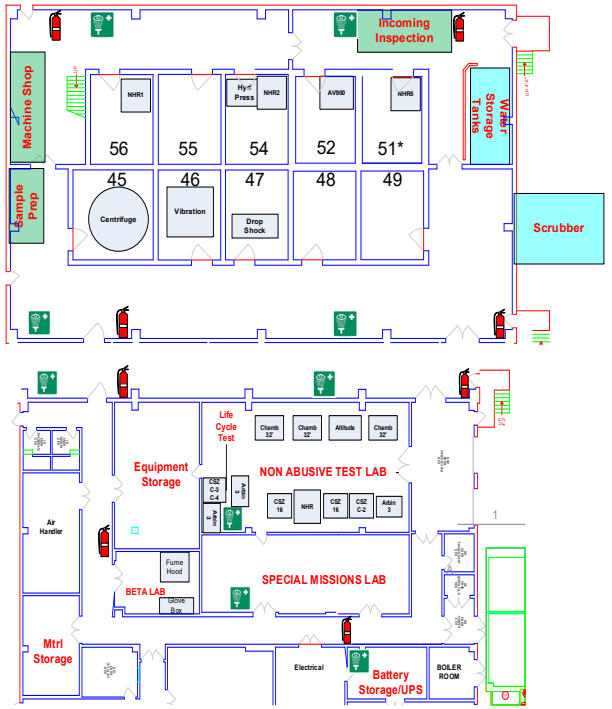
NSWC Crane Abusive T&E Capabilities

Primary Capabilities:

- ***Battery Abusive Test and Evaluation***
  - Short-circuit
  - Overcharge/over-discharge
  - High-Temperature
  - Crush
  - Penetration
  - Electrical Safety Device validation
  - Gas Sampling
- ***Engineering***
  - Acquisition Oversight
  - Fleet Intervention
- ***Environmental Testing***
  - Temperature Cycling
- ***Electromagnetic Interference (EMI)***
  - Measurement of EMI Characteristics in conformance with MIL-STD-461(D-G)

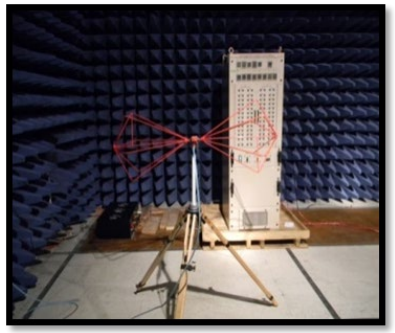


Value Provided:

- Specialized experience in initiation and evaluation of battery reactions
- State of the Art facility dedicated to safe & environmentally benign abusive testing of high-energy density batteries/devices
- 10 Containment Test Cells
  - 8 five pounds TNT rated equivalent explosive capable
  - 2 ten pounds TNT rated equivalent explosive capable
  - Nominal Test Cell Size 15’ X 20’
- Video/Sound, Infrared Video, and High Speed Video Capability
- Electromagnetic Interference (EMI) Expertise Providing Engineering Analyses for EMI Requirements and Evaluation

Product/Process Areas:

- Extreme/Abusive testing of high energy density Electrochemical Energy
  Storage Devices (Batteries)
- Safety Certification – Lithium Batteries
- Outdoor Test Area Availability for Large Platform / High Energy Density Testing



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NSWC Carderock Abusive T&E Capabilities

Battery Test Chambers (for abusive and non-abusive testing)

- Indoor Battery Test Facility
  - Four indoor boxes with two gas tight doors for personnel entry/egress and ventilation systems to expel gases to outside atmosphere, configured with supplemental gas analysis capability.
- Big Outdoor Box (BOB)
  - ~3x the size of the largest indoor test boxes with similar design features

USMC Lab

- Manufacture, assembly and test of low energy, low power expeditionary power systems and components
- Manufacture of custom test equipment, test fixtures and prototypes

High Voltage Test Facility

- Test and development of high voltage battery and shipboard power systems

Outdoor Hybrid Test Facility

- In situ testing of hybrid power systems

Fire Materials Evaluation Building

- 150kW and 1MW open hood calorimeter with supplemental gas analysis capabilities

Big Outdoor Box (BOB) Test Chamber

Indoor Battery Test Facility

1MW HRR Hood

Fire Materials Evaluation Building

ARMAG Enclosures

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Desired Testing Services

- Short Circuit
- Overcharge
- Overdischarge / Voltage Reversal
- High-Temperature
- Battery Management System
- Electrical Safety Device
- Propagation (cell-to-cell within module, module-to-module within battery)
- Crush
- Nail Penetration
- Bullet Penetration
- Environmental (temperature, humidity, altitude, vibration, shock, acceleration)
- Non-Abusive Testing (long-term life-cycle testing, etc)

Testing Services and Capacity

- Heat Release Rate Testing
  - Oxygen Consumption Calorimetry
  - Other Methods
- Gas Analysis
  - Total Volume
  - Gas Release Rate
  - Gas Constituents

- Describe your capacities for thermal, mechanical, and electrical abuse testing. Specify the maximum voltage that can be tested. Specify the maximum battery size (e.g., dimensions, weight, capacity in kWh) that your facility can accommodate for these tests.
- Indoor abusive testing > 10kWh desired

Business Information

- Please provide the following information about your organization:
  - Testing Standards: (Navy S9310, UN 38.3, UL, SAE, IEEE, ISO, etc)
  - Willingness to Collaborate: State your company's willingness to work with the DoW.
  - Business Structure: Indicate whether your company is an independent testing facility or part of a larger battery vendor or manufacturer. Note any potential concerns working with proprietary data.
  - Testing Constraints: Are there any constraints to the type or amount of testing that can be performed at your facility? (location, environmental permit restrictions, etc)

Contact Information

- **Contracting:**

  Mark Dravet
  Agreement Specialist
  Naval Surface Warfare Center, Crane Division, (NSWC Crane)
  Code-0242, Bldg. 3373
  Phone: 812-381-7085
  email: mark.v.dravet.civ@us.navy.mil

- **TPOC:**

  Jason D. Leonard
  Chief Engineer, Power and Energy Systems Division
  Naval Surface Warfare Center, Crane Division (NSWC Crane)
  Code JXM, Bldg. 3235
  Cell: 812-381-2597
  NIPR: jason.d.leonard.civ@us.navy.mil
  SIPR: jason.d.leonard1@navy.smil.mil

EMC² RFI: Autonomous System to Reduce Risk Warfighters Encounter

Presented by: Lance Buechler, Branch Manager
Contracts Department, NSWC Crane

CAPT Rex Boonyobhas, USN
Commanding Officer

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Dr. Angie Lewis, SES
Technical Director

Background / Request for Information

- Autonomous System to Reduce Warfighter Risk – Request for Information (RFI)
  - Purpose
    - Autonomous Systems
      - Uncrewed Systems
        - » Uncrewed Ground Vehicles
        - » Uncrewed Aircraft Systems
        - » Unmanned Surface Vehicle (Boat)
        - » Unmanned Underwater Vehicle
  - Required
    - Weight
      - Less than 45lbs
    - Battery Life
      - » 30-minute run time
    - Minimum Speed
      - » 2.5 and 4 MPH

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ADDITIONAL INFORMATION

- Carrying Capacity
  - How much weight can your UxS carry?
  - Max Weight and full speed
- Safety
  - Redundant safety (visible LED lights, pull pins, etc.)
  - Timer Feature
- Cost
  - Per unit and production capabilities
- Blue UAS
  - UxS on the current Blue UAS list
  - Parts manufactured – United States or allied country
- TRL
  - TRL of system
- Android Tactical Assault Kit
  - Ability to work with ATAK
- Autonomy
  - Autonomy integration
- Contested Operational Environment
  - Hand signals, voice commands, etc.
- Kinetic / Non-Kinetic Launcher
  - Test with safety approvals

EMC² RFI: MK34 / MK48 Gun Weapon System - Electro Optic Sight Sensor (EOSS)

Presented by: Lance Buechler, Branch Manager
Contracts Department, NSWC Crane

CAPT Rex Boonyobhas, USN
Commanding Officer

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Dr. Angie Lewis, SES
Technical Director

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Background / Request for Information

- Purpose
  - Replacement for MK20 MOD 1 Electro-Optic/Infrared (EO/IR) Sight System (EOSS)
    - EOSS shall interface with the Gun Weapon System Local Area Network
    - Remotely controlled by government furnished MK160 Gun Computer System (GCS)
    - Primary Use: Gun sight for the MK34 and MK48
- Systems
  - Ticonderoga class cruisers (CG-47)
  - Arleigh Burke class destroyers (DDG-51)
  - Coast Guard (USCG) Legend class National Security Cutters (NSC) (WMSL-750)
  - USCG Heritage class Off-shore Patrol Cutter (OPC) (WMSM-915
- RFI Objective
  - Delivery timelines
  - Prototype capabilities
  - Production capabilities
  - Integrated Logistics/Product Support timelines
  - Government Purpose rights

New MK34/MK48 GWS EOSS contract was deferred in 2022 due to lack of available funding; Initial RFI responses provided positive indicators that new competitive contract was attainable

EMC² RFI: SENSEI Data Fusion Correlator

Presented by: Brenda Roush, EMC² Program Manager
Power and Energy Systems Division, NSWC Crane

CAPT Rex Boonyobhas, USN
Commanding Officer

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EMC² RFI: SENSEI Data Fusion Correlator

Background

The Topic Sponsor desires to collaborate with EMC² Members and industry to discuss the topic and possibly shape future EMC² Request for Solutions (RFS).

SENSEI is an integrated multi-sensor, multi-weapon, multi-domain counter-unmanned system (C-UxS); its objective is to detect-to-defeat Counter-small Unmanned (Air, Ground, Surface, Undersea) System (C-sUxS) to protect Navy/DoD critical infrastructure and assets. While SENSEI hosts a wide range of sensors, those sensors have inherent limitations in coverage, accuracy, and susceptibility to noise, clutter, or environmental conditions which may cause uncertainty, bias, or conflicting information, limiting their effectiveness in detecting, tracking, and effecting unmanned threats.

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EMC² RFI: SENSEI Data Fusion Correlator

Objectives

- Determine the availability of Data Fusion Products which are available for integration with third party Command and Control (C2) Software
- Determine the tested performance of the fusion products to inform the requirements
- Determine the capabilities (performance specifications) of existing data fusion products
- Objective is to **not** include solutions that are dependent upon or cannot be decoupled from the C2 functionality

Submission Deadline: 20 MAR 2026

Topics to Address

- Data Alignment/Synchronization/Heterogeneity
- Latency
- Error management
- Track Metrics/Figures of Merit
- Integration/Functionality
- Swarm Data Fusion Considerations
- Other metrics you recommend

EMC² RFS: Improved Tactical Aviation Armaments Systems (ITAAS)

Presented by: Lance Buechler, Branch Manager
Contracts Department, NSWC Crane

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Commanding Officer

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Background / Request for Solutions

- Concept
  - Crew-served weapon mount design to attach to helicopter
    - Leverage industry for new functional prototype
    - Manufacturing best practices, preliminary drawing packages and manufacturing ability
- Manufacturing Capabilities
  - Evaluate the Government-provided notional design and drawing package to assess manufacturability and identify potential production cost reductions
  - Develop and deliver a white paper detailing the assessment and providing recommendations for minor design changes based on manufacturing best practices
  - Fabricate the system based on the approved final design to evaluate and prove manufacturability of the system
  - Shall follow all material, coating, and other specifications provided in the drawing
  - Provide material certifications to validate the materials used in the production asset

Successful Prototype Criteria

- Technical Performance Criteria
  - Material and Post Process: The initial prototype produced will material, coating and other information provided on drawing and provide material certifications
  - System Footprint: Prototype will stay within tolerance values listed on the drawing package and will be validated by assembly and testing events.
- Manufacturing and Producibility Criteria
  - Manufacturing Readiness: Achieve a specified Manufacturing Readiness Level (MRL) (e.g., MRL 1 for a low-rate initial production capability) by the end of the project.
  - Design for Manufacturing and Assembly (DFMA): The design assessment results in a final design package that has undergone a formal DFMA review, with all critical issues resolved or accepted due to design requirements.
- Transition and Outcome Criteria
  - User Acceptance: Favorable qualitative feedback from the target aircrew/maintainer users during hands-on evaluation and flight testing.
  - Government Acceptance: The responsible approving official provides a written determination that the prototype met the key technical goals or satisfied the success metrics incorporated into the OT agreement.
  - Path to Production: The project yields sufficient data and a viable design package to justify a follow-on production decision without further competition.

EMC² RFS: Drone Killer Cartridge

Presented by: Lance Buechler, Branch Manager
Contracts Department, NSWC Crane

CAPT Rex Boonyobhas, USN
Commanding Officer

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Background

- Drone Killer Cartridge Video
- **Extended range, shotgun-style effects through automatic rifles and machine guns**
- **Enhanced kinetic kill capabilities against stationary and moving drones by helping offset imperfect aim**
- **Increased probability of hit and kill along with inherent reduction in collateral damage**
- **Sub-projectile exit velocities, energies and effective range far superior to shotgun capabilities**
- **Low unit cost and low cost-per-kill**
- **Seamless integration with existing weapon systems (No gun mods)**
- **Navy-designed, U.S. Government-owned, and easily scalable**

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Mature DKC Products

5.56x45mm Segmented DKC

7.62x51mm Segmented DKC

7.62x51mm Pelletized DKC

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RFS – Wargaming Modeling & Analysis

COMING SOON!

RFS for the Development of Prototype for Wargaming

- AI Model
- Integration and Operational Capability
- Quantitative Analysis Ability
- Adaptable

Expected release date: ~May 2026

Initial demonstration: ~August 2026

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Broad Request for Solutions (BRFS)

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Broad Request for Solutions Projects (BRFS)

What It Is

- Broad solicitation vehicle used to identify emerging tech solutions from consortia members against high-level technical statements of need (SONs) over an elongated submission period

Primary Benefit

- This option creates a "ready-to-buy storefront" for emerging requirements instead of the usual one-requirement-at-a-time approach

Key Advantages

- Member solutions can be evaluated and awarded at any time during the PoP
- Faster procurement for high-priority member capabilities
- Eliminates starting from scratch when developing urgent operational requirements
- Creates comprehensive capability marketplace for rapid acquisition
- Allows the Government to catalog and search prototype-ready solutions that could meet a current or future need

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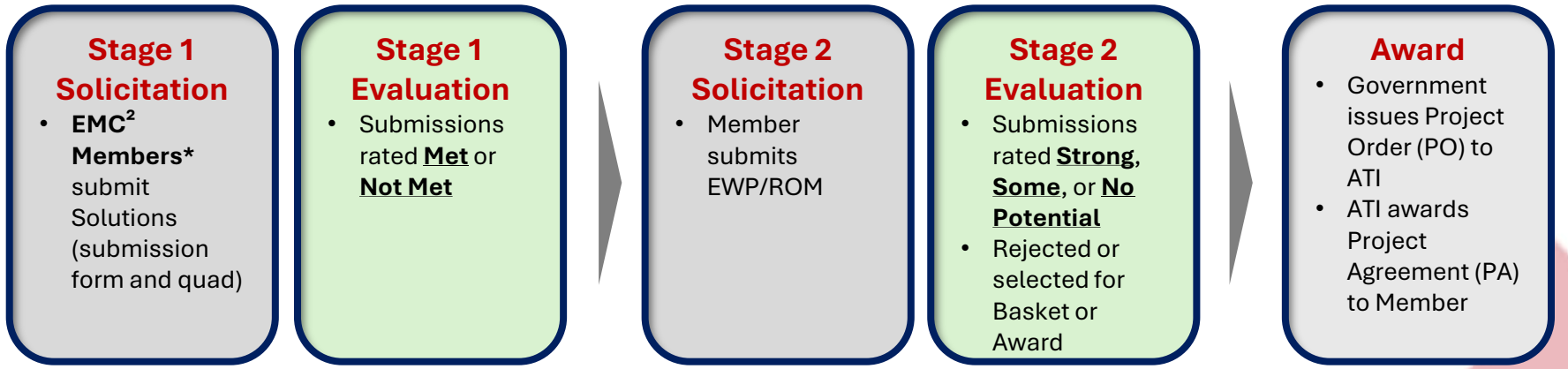
BRFS Process

High-level Process Flow

- EMC² or LEAN Power posts a BRFS, with a SON for a technology area, that would remain open for an extended period of time
- Consortium members may submit as many responses as developed under each topic showing the Government their potential solutions
- Government may require pitch presentations or additional information
- Qualified solutions are held in the basket for up to 3 years after submission
- Basketed solutions can be acquired rapidly upon selection and funding availability



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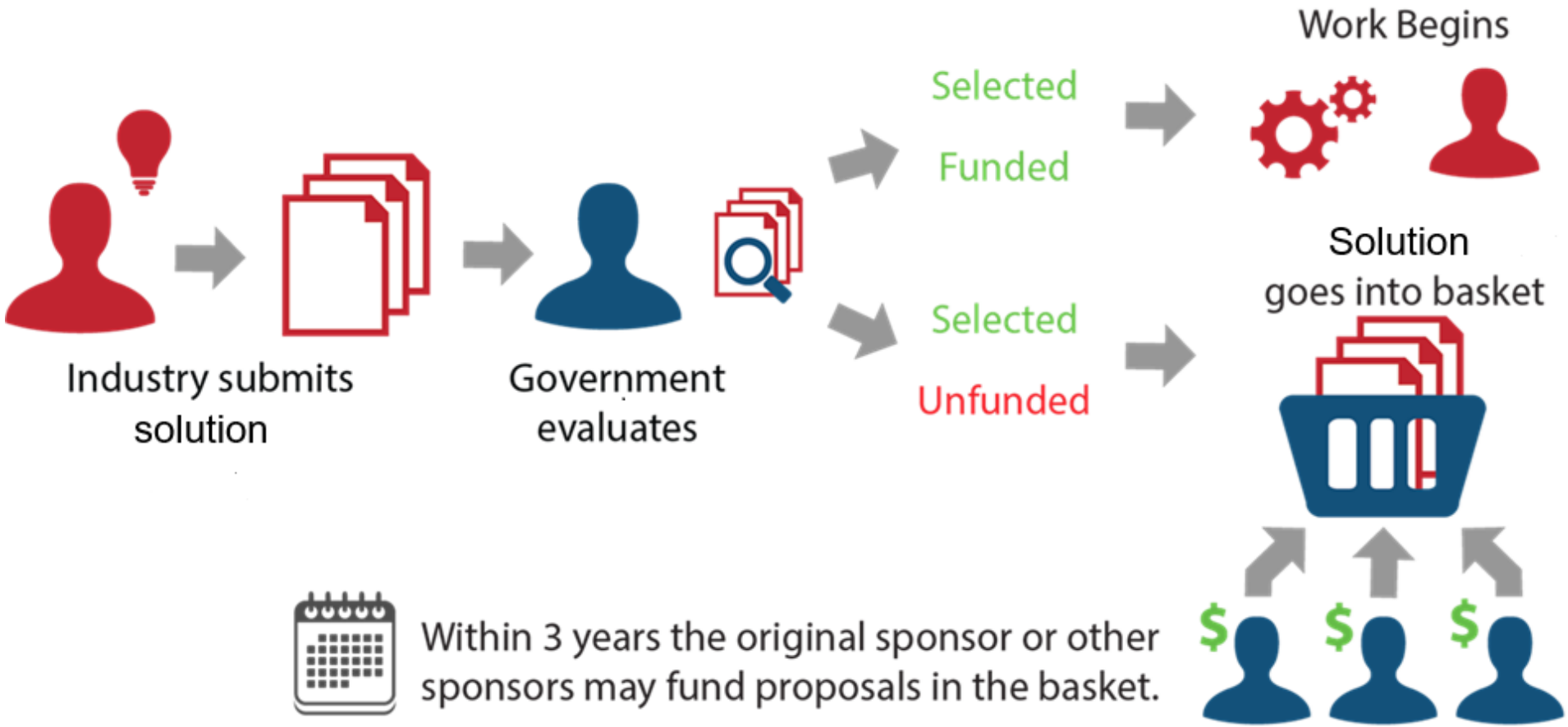
Basket Provision

Basketed



Within 3 years the original sponsor or other sponsors may fund proposals in the basket.

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BRFS 26B1-04 – Advanced Battery Technology

Current Challenges:

- Growing energy demand vs. contested logistics
- Limited enterprise-wide energy visibility
- Slow adoption of technology
- Insufficient integration into exercises
- Lack of securely sourced, common, safety-characterized battery solutions

Success Criteria:

- Improving enterprise-wide energy visibility and data collection
- Accelerate the development and fielding of new technologies
- Prioritizing strategic supply chain resilience and diversification
- Supporting dual-commercial-military use and common or standard form factors
- Characterizing safety behavior quantitatively
- Informing threshold-based battery safety risk assessments
- Enhancing training and education across the force to institutionalize operational energy as a core component of mission planning

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BRFS 26B1-03 - Improved Water Resilience

Problem Statements:

1)Real time monitoring of water quality

2)Obsolete component mitigation

3)Well Deck Reverse Osmosis (RO)

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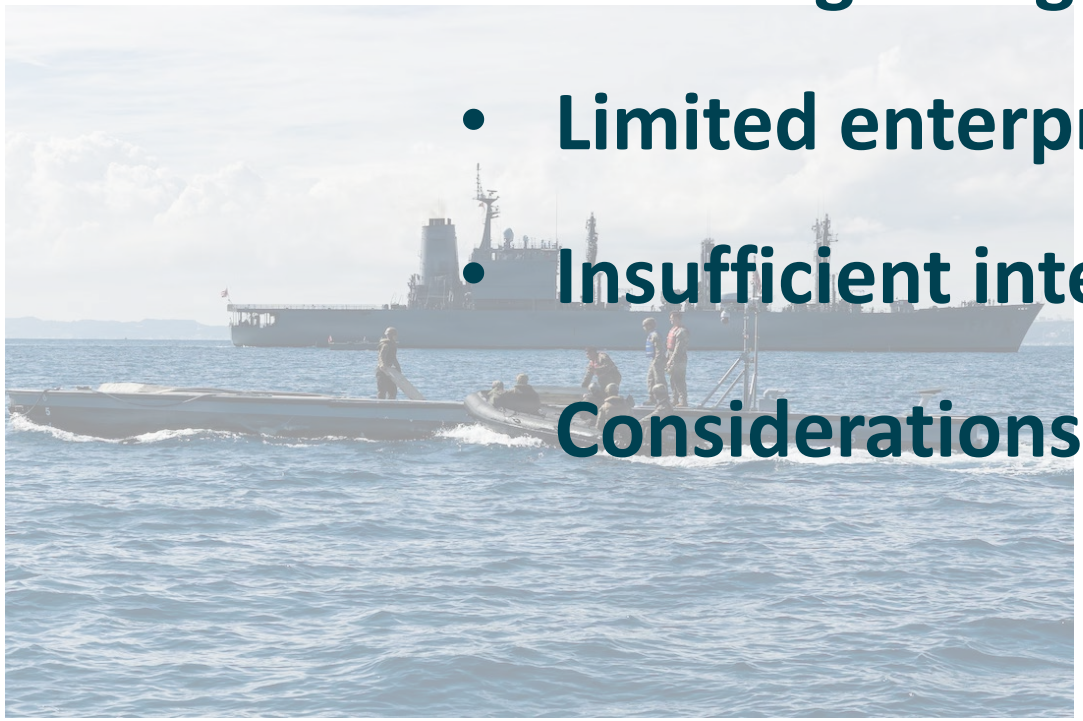
BRFS 26B1-01 – Contested Logistics

Strategic and Operational Concerns:

- Growing energy demand versus contested logistics
- Limited enterprise-wide energy visibility
- Insufficient integration of Operational Energy Considerations into exercises

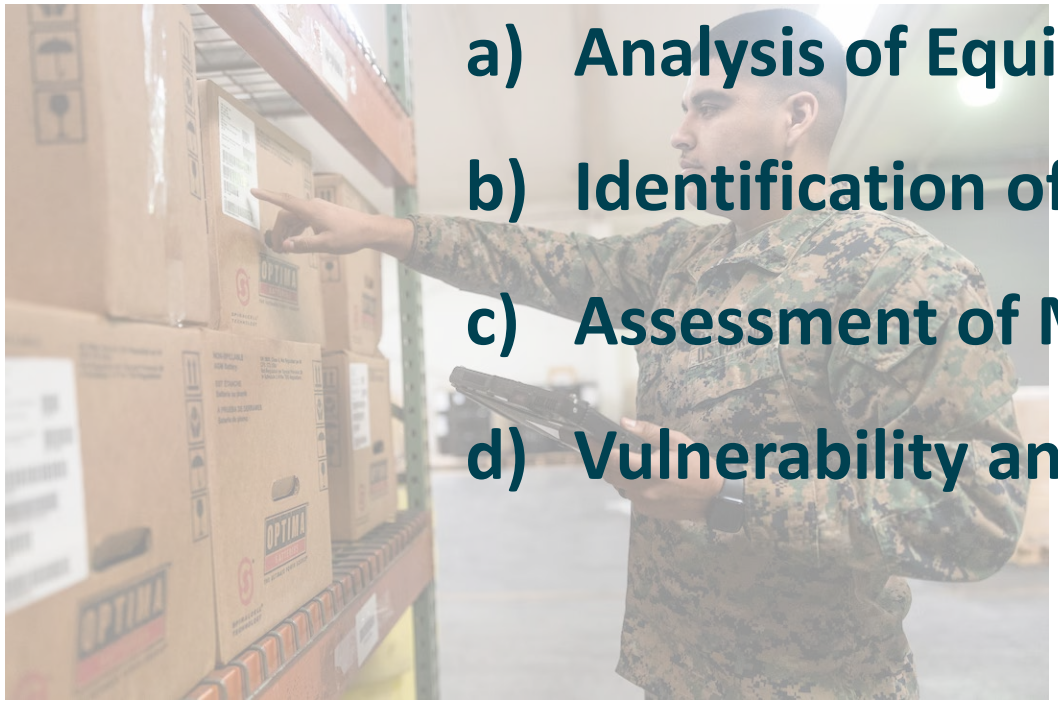


NAVSEA
WARFARE CENTERS
CRANE

BRFS 26B1-10 – Supply Chain

Problem Statements:

- Development of a process that allows for initial and ongoing information and analysis of differing Supply Chain areas:



a) Analysis of Equities and Ownership

b) Identification of Overlapping Equities with DoW Interests

c) Assessment of Market Domination

d) Vulnerability and Risk Assessment

QUESTIONS