



# 2010 ONR Naval S&T Partnership Conference

Next Generation Technologies for Today's Warfighter

**TechSolutions**

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Revolutionary Research . . . Relevant Results

O F F I C E O F N A V A L R E S E A R C H

# What is TechSolutions?

Rapid-response S&T solutions  
to immediate Fleet/Force needs  
identified by Sailors and Marines

- New applications of emerging/existing technologies
  - Well-bounded problems with S&T solutions
  - Impact the individual warfighter
  - Prototypes evaluated in an operational context
  - Fleet/Force feedback early and often
- Goal: prototype demo within 15-18 months of request
  - Delivered to original requestor, when possible

# Typical Project Profile

- Request submitted by E4 - O4 Sailor/Marine
  - Or ONR Science Advisor
- Solution developed by Naval Research Enterprise (NRE) or National Labs
  - Commercial &/or academic partners are common
- Average project ~\$750K total
- Maximum 12 months to complete project
- Feedback from Fleet/Force early and often
- Overall TechSolutions budget ~\$10M/yr

# TechSolutions Process

Step	Timeline
<ol style="list-style-type: none"> <li>1. Request received</li> <li>2. Request validated</li> <li>3. Problem &amp; solution defined</li> <li>4. Solicit solution ideas from NRE</li> <li>5. Winning proposal selected</li> <li>6. Funding initiated; project begins</li> <li>7. Prototype demo/evaluation in the field; transition to Fleet/Force</li> </ol>	<ul style="list-style-type: none"> <li>• Within 1 week</li> <li>• +45 days</li> <li>• +60 days</li> <li>• +90 days</li> <li>• +30 days</li> <li>• ~12 months from project start (15-18 months from request)</li> </ul>

Submitter, command staff and technical experts are involved throughout

# Project Ranking Factors

- Scope of the solution
- Severity of the problem (impact)
- Level of S&T required
- Scope of the benefit
- Cost savings
- Transition potential

# FY10-11 Projects

- **Aviation Enterprise**
  - LSO APARTS Replacement
  - ALE-43 Tactical Enhancements
  - Non-incendiary SAR Marker
  - Catapult CSV Calculator
  - *Tool Room Management System*
- **Surface Warfare Enterprise**
  - **SWOS Irregular Warfare Decision Training System**
  - **Automated Shipboard Weather Observation System**
  - **AIS Identity Validation Tool**
  - **Phone & Distance Line Replacement**
  - *EW Target Mapping Toolkit*
- **Undersea Warfare Enterprise**
  - **ASPM Software Update**
  - **Single Ping Sonar Algorithm**
  - **Solid State Lighting for Subs**
  - *CASS Software Update*
- **Expeditionary Combat Enterprise**
  - **Powered Rope Ascender**
  - **M203 Indirect Fire Sight**
  - **Power Management Kit for EOD Teams**
  - **Fast-Tint Eyewear**
  - **X-Met Expeditionary Meteorological Sensor**
  - **High-Energy Underwater Battery** (pending)
  - **Expeditionary TACSAT Surrogate** (pending)
  - *Enhanced Lightweight AUV*
  - *Imaging Through Walls*
  - *M777 Brake & Shock Sensors*
  - *SDV 360-degree Sensors*
  - *SDV Waterproof Transport Canister*
- **Information Dominance Enterprise**
  - **XR-2000 Receiver Upgrades**
- **Provider Enterprise (NAVSUP)**
  - **Food Service Management Software Replacement**

**Bold** = ongoing  
*Italics* = complete

# Powered Rope Ascender

## OPERATIONAL NEED

**Objective:** Develop powered rope ascending device suitable for VBSS teams, remote casualty evacuation, helicopter extraction operations, and mountain warfare assault teams.

**Value to Warfighter:**

- Reduced fatigue and increased efficiency in mission execution
- Increased speed and opportunity for helicopter extraction

**Impact if Not Addressed:**

- Helicopters must find suitable landing site or possess special rescue hoists that are in limited supply to perform extractions
- Slow manual ascent in vertical assault leaves warfighters fatigued and tactically exposed to enemy forces

**Submitters:** LT at MSRON THREE, VBSS  
ONR Science Advisor at MARFORPAC



## SOLUTION

**The Technology:**

- High power density battery; hot-swappable
- Compact, high horsepower motor
- Durable, lightweight materials; waterproof design
- Compatible with current climbing equipment and procedures
- Powered reverse rappel or portable winch

**Partners:**

- NSWC Panama City
- MARFORPAC Experimentation Center
- Atlas Devices, LLC

**Key Metrics:**

- Weight ~ 20 lbs
- Lifts up to 500 lbs
- Max speed ~5 ft/sec
- Hot-swappable battery

**Status:**

- Final user assessment: Jan 2011

**Potential Transition Sponsor:**

USMC Mtn Warfare Trng Group (PM ICE)

**S&T Focus Area:**

Naval Warfighter Performance and Protection  
(Enhanced Human Performance)

# Fast-Tint Protective Eyewear

## OPERATIONAL NEED

### **Problem:**

Pausing to manually change fixed-tint ballistic eyewear lenses in response to differing lighting conditions (interior/exterior movement) during the conduct of combat operations is not practical.

### **Value to Warfighter:**

Increased situational awareness and eye safety during transitions between light and dark environments

### **Impact if Not Addressed:**

Operators compromise visual acuity when moving from light to dark spaces, or risk eye injury due to removal of eye protection

**Submitter:** N833 CIV at NAVSPECWAR



## SOLUTION

### **The Technology:**

A liquid crystal host containing dichroic dyes is sandwiched between two flexible plastic substrates coated with transparent electrodes, and applied to a lens. Application of voltage to the liquid crystal substrate alters the transmissivity and/or color of the lens according to the properties of the embedded dyes.

**NRE Performer:** NSWC Crane

### **Partners:**

AlphaMicron, Inc  
WSTIAC

### **Key Metrics:**

- ANSI ballistic protection lens
- Tint change time < 0.5 sec
- Four colors: clear, dark gray, blue, amber
- Battery lasts 55 + hrs per charge

### **Status:**

- Final product delivery January 2011
- NSW assessment through April 2011

**Transition sponsor:** NSW/USSOCOM

**S&T Focus Area:** Naval Warfighter Performance  
(Warfighter Protection)

# Enhanced Lightweight AUV

## OPERATIONAL NEED

### Problem:

Enhanced navigation, communication, and data collection capability is needed in a low-cost, lightweight Autonomous Undersea Vehicle (AUV) to improve environmental data collection in shallow water environments

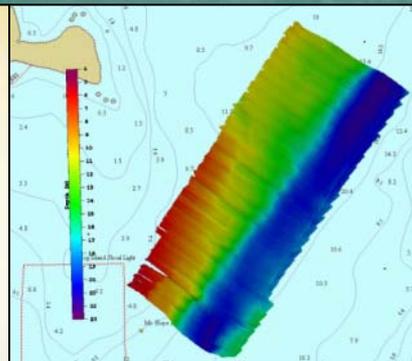
### Value to Warfighter:

Improved fidelity, accuracy, and timeliness of bathymetry data

### Impact if Not Addressed:

Limited ability to map obstacles and identify maneuvering constraints in shallow water

**Submitter:** LCDR at NSW



## SOLUTION

### The Technology:

- DVL/ADCP/INS navigation technology
- Extended range WiFi and Iridium satellite communications
- Expeditionary Multi-beam Kit (EMK) for swath bathymetry and bottom backscatter data

**NRE Performer:** NUWC Newport

### Partners:

- Naval Oceanographic Office
- MIT
- OceanServer Technology, Inc.
- YSI, Inc.
- UMASS Dartmouth AMTC

**S&T Focus Area:** Operational Environments

### Key Metrics:

- ~60" long, ~60 lbs; one-person ship or shore launch
- One operator can control multiple vehicles
- On-scene data products in minutes
- Field maintenance and repair

### Status:

- Three vehicles delivered to Navy Sept 2010
- Inserted in pre-deployment exercises Nov 2010
- Deploying to theater ~Jan 2011

**Potential Transition Sponsors:** NSW, CNMOC

# Aviation Toolroom Management System

## OPERATIONAL NEED

### Problem:

Manual logging process used in aviation tool rooms is slow and error-prone, and does not accurately track HAZMAT use

### Value to Warfighter:

- Increased efficiency and accountability
- Positive accountability for all tools
- Proper, quantifiable issue and tracking of HAZMAT

### Impact if Not Addressed:

- Slow process increases maintenance time
- Errors lead to misplaced resources and wasted time

Submitter: AM1, NAS North Island, San Diego



## SOLUTION

### The Technology:

- Customized resource tracking & management software
- Barcode scanning technology

### Status:

- Project complete
- CNAF to implement throughout Aviation Enterprise

### NRE Partner:

- NAVAIR Lakehurst

### Key Metrics:

- End-of-shift process time reduced from 1 hr+ to ~5 min
- Lost tool incidents reduced from 1-2 per month to zero
- Training time reduced from weeks to minutes
- No longer need to shut down tool room for duty change
- More timely reordering means less time lost
- Improved working conditions and Sailor morale

Transition sponsor: PMA260A, CNAF

S&T Focus Area: Total Ownership Cost  
(Manning Optimization)

# Success is a team effort

- **Warfighters:** Send us your high-interest, near-term technology needs
- **Researchers:** Sign up to receive solution idea solicitations
- **Industry/academia:** Partner with NRE to provide solutions

*We respond to requirements pull, not technology push*



# Contact Information

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