

US Special Operations Command



USSOCOM Technology Needs Briefing for Center of Excellence for Research in Ocean Sciences

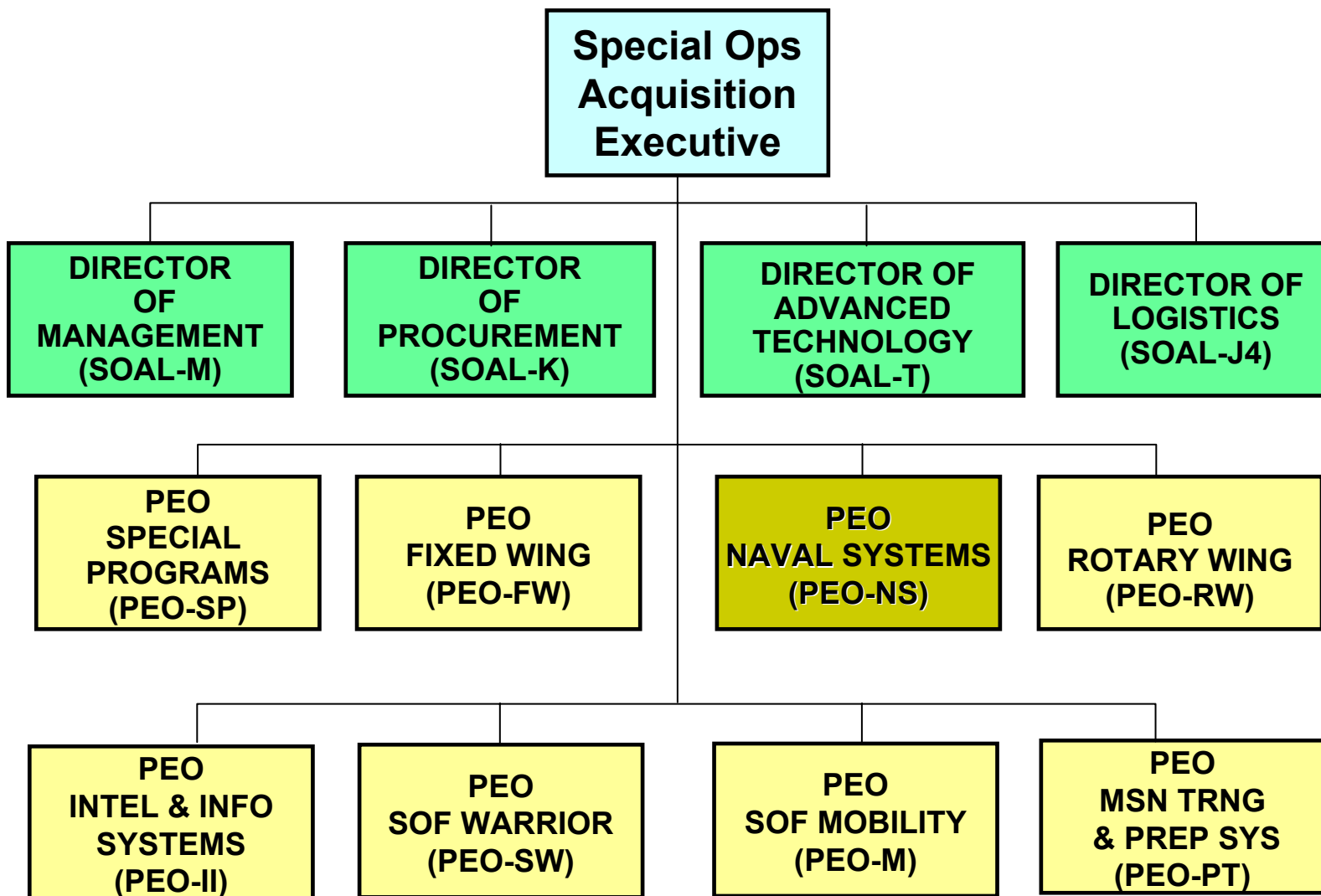
Mark Pecoraro
PEO-Naval Systems
Assistant Program Executive Officer
Advanced Maritime Systems
Mark.pecoraro@socom.mil

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USSOCOM Acquisition & Logistics Center

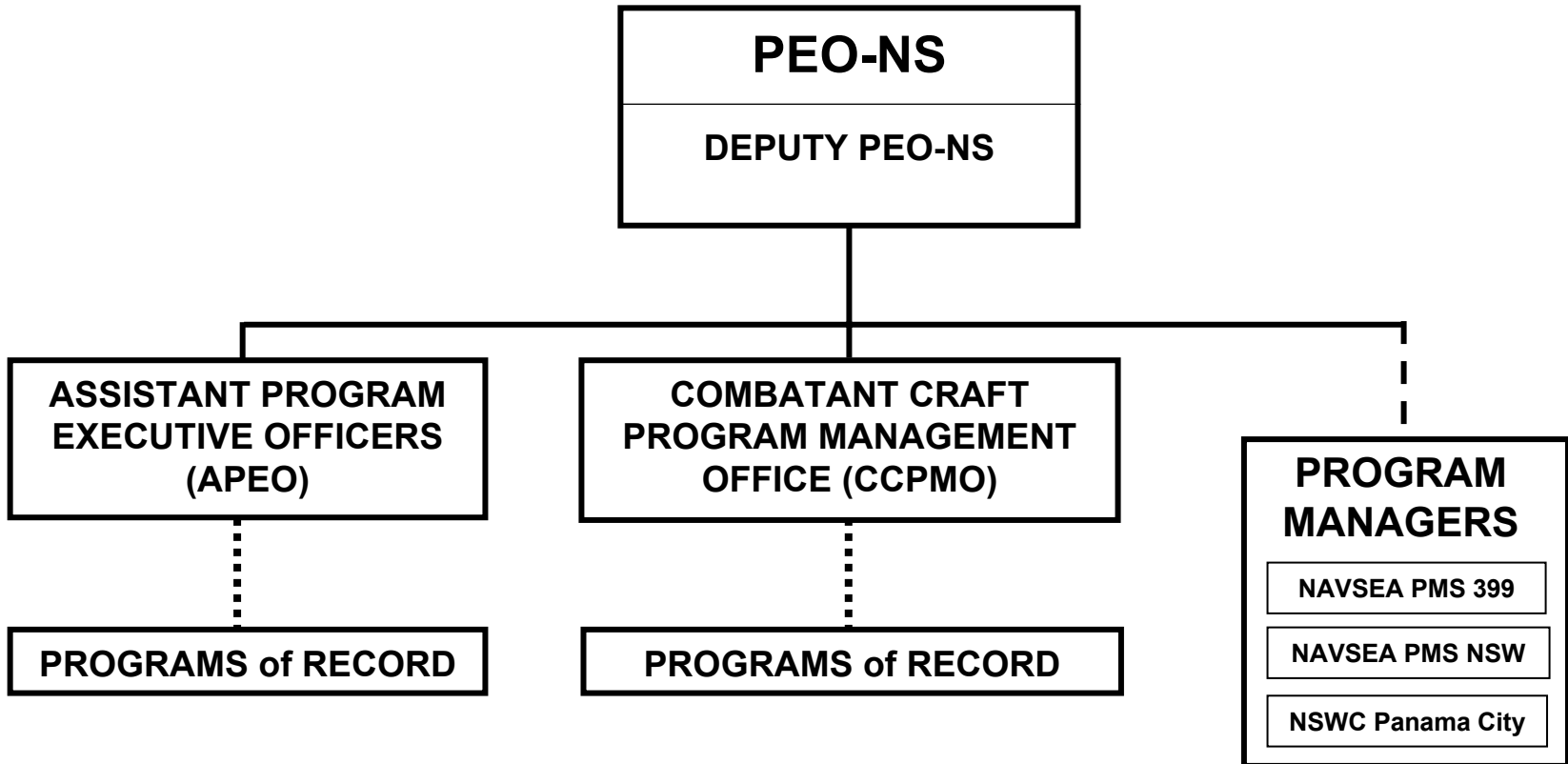
(SOAL -Special Ops Acquisition & Logistics)





USSOCOM

Program Executive Office Naval Systems





USSOCOM Acquisition Mission



Provide Rapid and Focused Support to SOF Warfighters



PEO-NS Programs

APEO Portfolio Programs of Record





PEO-NS Programs

CCPMO Portfolio Programs of Record





PEO-NS

Technology Development Objectives

- To achieve our acquisition mission to support future SOF efforts, PEO-NS has identified and approved three Technology Development Objectives (TDO) for SOF
- Revolutionary Change in a Defense Capability

“Approved” – willing to seek and provide resources for development and fielding based on requirements



PEO-NS

Technology Development Objective

■ Undersea Vehicle Energy Storage Systems

- **SOF Combatant Submersibles (CS) Require Advanced Energy Storage Systems with Significantly Higher Capacity (Energy/Volume and Energy/Weight)**
- **Current Submersibles Use Rechargeable Silver-Zinc¹ or Lithium-Ion² Batteries (1300 KWh in Hybrid Dry, 90 KWh in Smaller Wet)**
- **Current CS Achieve Performance of ≥ 0.30 KWh/Liter and ≥ 0.12 KWh/Kilogram**

■ **SOF is Interested in Technologies that Approach Storing/Delivering 1.5 KWh/Liter and/or 0.6 KWh/Kilogram of Electrical Energy**

1 SDV

2 ASDS



PEO-NS

Technology Development Objective

■ Advance Surface Power Systems

- SOF Combatant Craft (CC) Require Advanced Power Systems that Provide Significantly Better Power/Weight Ratios (Max hp/lb) at Top Speed and Better Fuel Efficiency (lb/hp·h) at Most Efficient Speed (Cruise Speed)
- Current CC Use Twin Engines Ranging from 400-2750 HP Burning Diesel and Jet Fuels (Kerosene)
- Current CC Have a Power/Weight Ratio of ≥ 0.38 hp/lb at Max Speed and Fuel Consumption of $\geq .23$ lb/hp·h at Cruise Speed

■ SOF is Interested in Technologies that can Meet or Approach Power/Weight ratio of 1.0 hp/lb and/or Fuel Efficiency of 0.1 lb/hp·h at Cruise Speed



PEO-NS

Technology Development Objective

- **Small High Bandwidth SATCOM Antennas**
 - **SOF Combatant Craft (CC) Require Small High Band-Width SATCOM Antennas to receive (and transmit) increasingly complex communications while underway**
 - **Current CS Use Low Bandwidth Omni-directional UHF SATCOM Antennas developed for aircraft (25 kHz bandwidth) which weigh less than 10 lbs**
- **SOF is Interested in Small Satellite Antennas that operate in C, X, or Ku Band; can achieve at least 1.5 Mbps RCV & 256 Kbps XMIT; and can be used on small craft (~40' LOA)**



PEO-NS

DRAFT Technology Development Objectives

- In addition to the three approved, PEO-NS has also identified five Draft TDOs for FY'09



PEO-NS

DRAFT Technology Development Objective

■ **Combat Swimmer Thermal Protection Systems**

- **SOF Combatant Swimmers Require Advanced Diver Thermal Protection Systems. Combat Swimmers require protection while inactively sitting in wet submersible for long transits, then while undergoing moderate exertion while swimming in target areas.**
- **Currently Combat Swimmers use a variety of Commercial-Off-The-Shelf Wet and Dry Suits that are unable to provide sufficient protection, limiting the swimmer stay times in extremely cold and extremely warm water.**

- **SOF is Interested in Technologies that can Allow Combat Swimmers to Meet or Approach Dive Times of 12 hours in 28 deg F water, 12 hours in 100 Deg F water while both at rest in SDVs and while swimming. Keywords: Lightweight, diver survivability, diver dexterity, maintain core temperature.**



PEO-NS

DRAFT Technology Development Objective

- **Low Cost Dry Submersible: Hull, Mechanical & Electrical (HM&E) Technology**
 - **SOF Combatant Submersibles (CS) Require Lower Cost HM&E Technology for Dry Manned Submersibles. Dry Submersibles Design & Construction Must Meet Stringent Hyperbaric System Safety Standards (e.g. ABS, P9290). System must support long-duration operations, swimmer lock-in/lock-out, and operations in shallow water.**
 - **Current Dry CS is the ASDS, with a \$200-400M construction cost approaching that of a warship. A significant portion of that cost is in construction of the HM&E systems**
- **SOF is Interested in Dry Submersible HM&E Technologies that can Meet or Approach a Unit Construction Cost of Under \$20M.**



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DRAFT Technology Development Objective

■ **Lightweight, Multi-fuel Outboard Engines**

- **SOF currently use gasoline outboard engines with combat rubber raiding craft, F470. Gasoline storage poses unique safety hazards on board ships and submarines. Also, DoD is phasing out gasoline on the battlefield, substituting diesel and kerosene (JP5, JP8). The most significant outboard characteristics for SOF are power, weight, and cost.**
- **Current SOF Outboards are the Bombardier/OMC 55Hp and 35Hp gasoline engines. SOF has tested the Evinrude Vindicator Multi-Fuel Engine (55 Hp, 240 lb), but it is too heavy for most of SOF.**

- **SOF is Interested in Lightweight, Submersible, Kerosene or Diesel-Fueled Outboards that are at least 35 Hp, weigh less than 160 lb, and have a unit production cost less than \$12,000 in small lots**



PEO-NS

DRAFT Technology Development Objective

- **Underwater Breathing Apparatus (UBA)**
 - SOF currently utilizes the Mk 25 (LARS) and the Mk 16 UBAs.
 - Current UBAs perform at operating depth and meet SOF requirements.
 - Mk 25 weighs 31 lbs; Mk 16 weighs 70 lbs; both UBAs are neutral in sea water.
 - Both systems utilize optimized commercial/recreational scrubber technology

- **SOF is Interested in Technologies that Increases Delivering Equivalent Volumes of Breathable Gas in a Smaller, Ergonomic and Modular Package, with Decreased Breathing Resistance and Alternative Scrubber Technology.**



PEO-NS

DRAFT Technology Development Objective

■ **Combatant Craft Shock Mitigation**

- **Current Mitigation Techniques are Adequate for Certain Combatant Craft (CC) such as the Mk V, however, as the Envelope is Pushed, New Technologies are required to Adapt to the new Envelope.**

Capabilities/Areas of Concern

- **Establish Human Injury Thresholds to Repeated Mechanical Shock Exposure and Investigate Mature Shock Mitigating technologies Pertaining to the Seat/Human Interface.**
- **Investigate Advanced Hull Forms which Mitigate the Shock Exposure to both Humans and Equipment**



Technology Areas of Interest

- **Prioritized Command Capability Gaps**
- **Next Generation Radio Frequency (RF) System**
 - Multi-purpose, Fully Integrated Man-portable / Vehicle Mounted
 - C2, Targeting, Navigational / Geo-location, TTL Exfill, SIGINT, Blue Force Tracking (BFT), Counter Improvised Explosive Device (IED)
- **Next Generation SEAL Delivery Vehicle (SDV) / Modular Ground Vehicles**
 - Development of Technology Advancement Projects
- **SOF Advanced Technology Demonstrations (ATDs)**
 - Night Vision Windshield / Advanced Distributed Aperture System
 - SOF Web-enabled Training & Rehearsal System
 - Combat Autonomous Mobility System



Technology Challenges

Smaller, Lighter With Reduced Signature & Increased Capabilities

- **Tagging, Tracking and Locating:** Biometrics, Biomimetics / Bioinspired, Chemistry, Communications, Data / Signal Processing, Object Recognition, Micro / Nanotechnology
- **SOF Warrior:** Improved Protection, Lightweight Low-power Hyper / Multi-spectral Sensors Coupled with Digital Fusion Processing and Display Technologies, Tunable Lethal / Non-Lethal Weapon Systems to Achieve Surgically Precise Effects, Advanced Power Sources, Reduced Sensitivity Explosives, Performance Enhancements, Advanced Tactical Combat Casualty Care Techniques and Equipment, Advanced Ammunition, Tactical Threat Warning / Monitoring Equipment
- **Signature Management:** Reduction Across Spectrum Without Mission Impact, Clandestine Operations Capability

“USSOCOM’s number one technological shortfall is in our ability to persistently and remotely locate, track, and target a human.”

GEN Bryan D. Brown, USSOCOM CDR, HASC Testimony, 2 MAR 05



Technology Challenges (Cont.)

- **C4**: Seamless, Assured Secure Global Net-Centric Warfare Enabled Information Enterprise, Persistent ISR
- **Power and Energy**: Alternative and Advanced Lightweight Power Sources
- **Intelligence**: Global Near-Real-Time Situational Awareness, 100% BFT, Comprehensive All-Source Data Fusion and Distribution, Automated Advanced Data Mining & Processing Techniques
- **Mobility**: Survivable and Efficient, Extended Range New Family of Modular Vehicles, Advanced Robotic Systems



A photograph showing a group of people in black clothing on a wet street. In the foreground, a hand is sticking out of a puddle. The word "QUESTIONS?" is overlaid in yellow text with a white outline.

QUESTIONS?