Navy Presentation

to the NDIA

Munitions Executive Summit

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Agenda…

• The Navy - Industry Partnership
• Challenges - Today & Tomorrow
• A New Leadership Approach
• A New Technology Approach
Navy - Industry Partnership…

Partners rather than competitors

• Navy:
  – Translate warfighter needs into acquisition requirements
  – Ensure the capability and capacity exist to solve technical challenges
  – Serve as technical authority
  – Rapidly identify technology for weapons applications
  – Validate solutions and system effectiveness
  – Production source of last resort

• Industry:
  – Translate acquisition requirements into system designs
  – Major player in advanced research*
  – Provide system development and integration
  – Produce and deliver quality products
  – Perform intermediate and depot level maintenance

*DDR&E to SASC, 10 Apr 02; http://www.defenselink.mil/ddre/transformation/sega_testimony.pdf

Partners rather than competitors
Challenges of Today...

DOD Munitions RDT&E and Procurement

- Limited commercial market
- Specialized expertise
- Expensive facilities
- Production volume down
- DoD investment in energetics declined through last decade
- Environmental compliance costs up
- Eroding technical and industrial base

*From: OUSD(AT&L)/DS, LW&M office, Jan 04; data as of FY 04 PB
Challenges of Tomorrow…

CNO 2004 Guidance:

• Deliver the right readiness
• Expedite Sea Warrior
• Demonstrate our enhanced Fleet Response Plan (FRP) surge capability
• Improve productivity in everything we do
• Streamline and align total manpower structure
• Accelerate Sea Power 21 capabilities
Challenges of Tomorrow…
Navy Transformation: Sea Power 21

Meeting 21st century Navy energetics / ordnance needs:

- **Sea Strike** (Time-sensitive strike, covert strike):
  - Mission flexible propulsion and ordnance
  - Reduced size ordnance with increased lethality
  - Hard and deeply buried target defeat
  - Chemical-biological agent defeat
  - Extended range fire support
  - Stand-off minefield breaching

- **Sea Shield** (Theater air and missile defense, sea/littoral superiority):
  - Directed-energy weapons
  - Extended-range, over-the-horizon ballistic missile defense missiles
  - Organic mine countermeasures

- **Sea Basing** (Precise and persistent firepower):
  - Combat safe insensitive munitions
  - Packaging, handling and transportation of ordnance
Navy FY 04-09 Projections…

• Weapons Procurement (WPN):
  – Increasing investment:
    • Tomahawk
    • Advanced Medium Range Air-to-Air Missile (AMRAAM)
    • Standard Missile
  – Sustained investment:
    • Enhanced Sea Sparrow Missile (ESSM)
    • Sidewinder
• Procurement of Ammunition, Navy and Marine Corps (PANMC):
  – FY 03 up significantly
  – FY 04 down
  – Year-to-year variation but overall increase from FY 04 thru FY 09
• Research, Development, Test and Engineering (RDT&E):
  – Increased investment through FY 06, but returning to near FY 02 level by FY 09
    • Areas of munitions, ordnance and energetics level or down
A New Leadership Approach…

- Navy Energetics Leadership Board (NELB) chartered by NAVSEA and NAVAIR:
  - NELB provides a national focus for stewardship of Navy core competencies in Energetics
  - NELB is chaired by the Vice Commanders of NAVAIR and NAVSEA with participation from the NAWC and NSWC Commanders and Technical Directors

- NAVSEA Warfare Centers (NSWC/NUWC) aligning to focus on product areas:
  - Twelve (12) product areas
  - Each product area led by a SES Product Area Director (PAD)
  - Ordnance is one of the 12 product areas

- NAVAIR realigning all Energetics functions into Weapons & Energetics Department:
  - Energetics Research
  - Test & Evaluation
  - Weapons & Energetics Development and In-Service Engineering
Energetics...
Uniquely Military Products

• Defined as... explosives, propellants, pyrotechnics, reactive materials, related chemicals and fuels, and their application in propulsion systems and ordnance*

• Includes bombs, warheads, mines, fuzes, countermeasures, flares, obscurants, safe-arm devices, arming-firing devices, unguided rockets, missile rocket motors, ramjets, gas generators, gun projectiles and propelling charges, and cartridge and propellant actuated devices.

* Adopted, with modification, from 1994 Laboratory Cross-Service Study “Energetics” data call
Who are the Navy Energetics Players?

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Why the change?

• A core military and Navy competency is at risk:
  – Recapitalization to meet new global threat (CNO, Aug 03)
  – Downsizing and budget constraints

• NELB and Ordnance Product Area will:
  – Enhance alignment with the warfighters’ vision
  – Provide focus for stewardship of core Navy / national competencies in Energetics
  – Foster rapid transition of technology to the warfighter
  – Increase value to meet warfighters’ needs…best technical solutions
  – Increase efficiency…long-term cost avoidance through sharing of people and facilities
A New Technology Approach…
Build on established track record of transitioning technology to industry and the warfighter…

• Developmental products:
  – Developed over 80% of the explosives transitioned to Service use since 1985*
  – Developed 100% of Navy aircraft expendable infrared countermeasures*
  – Warheads – SLAM; AMRAAM; TOMAHAWK; Evolved Sea Sparrow Missile (ESSM); directional fuzes and warhead
  – Rocket motors – AMRAAM, Mk 22 Line Throwing Rocket
  – Anti-Personnel Ordnance Breaching System (APOBS)
  – Extended range naval gun propulsion

• Concept initiation:
  – MEMS S&A fuzing
  – Army/Marine Corps Mongoose mine clearing system
  – Hypergolic penetrators for assault mine breaching
  – CCAT** modular warhead
  – Joint Direct Attack Munition (JDAM)
  – Joint Stand-off Weapon (JSOW)
  – Precision imaging weapons
  – Laser Guided Bomb

• Quick reaction capability:
  – BLU-116 hard target penetrator
  – BLU-118B thermobaric cave buster bomb
  – Thermobaric warheads (Carl Gustav, Hellfire, SMAW**, LAW**)

* See Notes Pages for details.
** CCAT: Containerized countermeasures anti-torpedo torpedo;
SMAW: Shoulder-mounted, multi-purpose, assault weapon; LAW: Light assault weapon
A New Technology Approach…

- Numerous new Energetics technologies are emerging to meet capability based requirements:
  - Energetic materials by design
  - Structural energetic systems
  - Energetic materials for power generation systems
  - Micro detonics for sensor deployment
  - Nano material technology
  - High energy density materials
  - Reactive materials
  - Directed energy
  - Thermobarics
  - Micro Electro-Mechanical Systems
  - Adaptable ordnance
  - Miniature munitions
  - Hypergolic penetrators (MCM)
  - Non-toxic liquid propulsion
  - 0-signature
  - Low collateral damage ordnance
  - Selective effects
  - Green AP replacements
- Developed reactive material warhead
- Successful demonstration of full scale warheads
  - Enhanced catastrophic damage in AAW targets
  - Created recognizable damage in surface targets
- Firm technical basis for transitions
Summary…

• Energetics, ordnance, and munitions are core military competencies

• The Navy laboratory and industrial communities are serving the warfighter, PEOs and SYSCOMs well

• The Navy is transforming itself to better meet the warfighters’ needs

“Deliver the right readiness”
-- CNO’s Guidance for 2004
**NAVSEA Warfare Centers Product Areas**

**Force Level Warfare Systems**
- Warfare Systems Analysis, Architecture and Requirements
- Warfare Systems Engineering, Integration, T&E and Assessment

**Ships and Ship Systems**
- Ship Integration and Design
- Hull Forms and Propulsors
- Machinery Systems and Components
- Structures and Materials
- Environmental Quality Systems
- Vulnerability and Survivability Systems
- Signature and Silencing Systems

**Surface Ship Combat Systems**
- Air and Surface Surveillance and Detection Systems
- Combat Control Systems
- Engagement Systems
- Electronic Warfare Systems
- Combat Systems Engr, Integration, T&E & Assessment

**Littoral Warfare Systems**
- Mine Warfare Systems
- Amphibious Warfare Systems
- Special Warfare Systems
- Diving and Life Support Systems

**Navy Strategic Weapons Systems**
- Targeting and Shipboard Subsystems
- Missile and Re-entry Systems
- Weapons System Level Analysis, Testing & Evaluation
- Non-Nuclear Strategic Weapons Systems

**Ordnance**
- Warheads, Rockets, Ammunition & Other Ordnance Systems
- Energetic Materials
- Ordnance Safety, Logistics & Environmental Technology
- Cartridge Actuated, Pyrotechnic, & Specialty Devices

**USW Command and Control Systems**
- Submarine Combat Systems
- Submarine Sonar Systems
- Submarine Imaging and Electronic Warfare
- Submarine Communications
- Surface USW

**USW Weapon and Vehicle Systems**
- Torpedoes
- Unmanned Undersea Vehicles
- Platform Defensive Systems
- USW Launchers
- Submarine Missile Launcher Integration

**USW Ranges, Analysis and Assessment**
- USW Ranges
- USW Analysis
- USW Operational Assessment
- USW Integration

**USW Fleet Material Readiness**
- Depots
- Obsolescence Engineering

**Homeland Security and Force Protection**
- Homeland Security and Measured Response Options
- Force Protection and Chemical/Biological Defense Systems
- Mission Assurance Capabilities

**Surface Warfare Logistics & Maintenance**
- Performance Based Logistics
- Maintenance Engineering
- Fleet Material Management
NAVAIR Consolidation of R&D and T&E...

• Reduced 17 departments to 12
• Strengthens competency alignment
• Integrated R&D and T&E leadership and management
• Strengthens customer entry point concept
• Strengthens National Leadership
• Consolidated simulation and analysis capability
• Integrated system of systems test and experimentation capability
• New Engineering Sciences Department
• Integrated staff functions
Reactive Material Enhanced Bullet...

Capability:
- Direct fire standoff ignition of liquid fuel and/or solid propellant missiles with a reactive material round fired from a standard issue .50 cal rifle
- Preliminary results demonstrated improved performance over baseline MK211 HE round

Status:
- OSD quick response special program - NAVSEA NSWC Dahlgren Division and ATK/Thiokol
- Preliminary hazard analysis and interim hazard classification (DOD) complete assigned (1.2G) - NOSSA reviewing data for 1.4 designation
- OJAG approved
- Operational testing completed
- Technical Readiness Level (TRL): 7
- Awaiting WSESRB recommendation for Service release