A FUTURE NAVAL CAPABILITY

Platform Protection

Fundamentally, our Sailors and Marines need the means to win or avoid engagements with evolving threats. They need to be able to do this in stride, while projecting power from the sea. We must address threats from weapons, sensors, countermeasures, and stealthy systems. Naval platforms encounter all of these threats, and they must overcome them with organic means of self-defense. Our forces must achieve these new defensive capabilities in the context of a distributed, networked architecture; they must be able to fend off threats without being diverted from their mission.

Why is this Future Naval Capability important?

The Platform Protection Future Naval Capability (FNC) requires the development and demonstration of critical technologies for Naval platforms to win or to avoid engagements with evolving threats as they project power from the sea. Ships, submarines, fixed- and rotary-wing aircraft, small boats and Marine Corps vehicles—all of these are Naval platforms involved in power projection, and all such platforms require protection.

What's our investment strategy? In developing our core investment program, the Platform Protection FNC Integrated Product Team (IPT) focused on identifying and filling capability gaps, fulfilling commitments to funded acquisition programs, and designing a strategy that would provide the wherewithal to execute the program. Three enabling capabilities will get us there:

· ***First priority.*** We need to win or avoid engagements by torpedoes or mines. Our platforms need an effective response to advanced influence mines (those triggered by electric, magnetic, or acoustic emissions). They also need improved ways of detecting and responding to wake and acoustic homing torpedoes.

· ***Second priority.*** We need to win or avoid engagements in the littorals by weapons and platforms, by asymmetric threats, and by non-lethal weapons.

· ***Third priority.*** We need to resist and control damage from weapons while preserving our operational capability.

How are we filling the gaps in these enabling capabilities? The Platform Protection FNC execution plan concentrates on accelerated development and demonstration of technologies that will enable the filling of critical operational capability gaps in platform protection. Each enabling capability will have a set of milestones and transition opportunities.

First Priority: Ability to win or avoid engagements by torpedoes or mines.

Our platforms need an effective response to advanced influence mines through technologies that reduce their signatures. Improved ways of detecting and responding to wake and acoustic homing torpedoes—including algorithms to detect and classify incoming torpedoes and soft- and hard-kill counter-weapons—will help fill this gap.

· In FY 2004: Near Field Deamping.

· In FY 2005: Advanced Machinery Support Systems.

· In FY 2007: Next-generation Torpedo Countermeasure.

· In FY 2008: Surface Ship Acoustic Control. Netcentrically Aware Advanced Countermeasure. Next-Generation Degaussing.

Transition opportunities:

· Advanced Machinery Support—transition to SSN-774 in FY 07.

· Acoustic Control and Near Field Deamping—transition to DDG-51, DD-21, CG-21 in FY 09.

· Next-generation Torpedo Countermeasure—transition to large deck platforms in FY 09.

Second Priority. Ability to win or avoid engagements in the littorals by weapons and platforms, by asymmetric threats, and by non-lethal weapons.

"With the end of the Gulf War, it became very clear to countries that competing with Western armies, navies and air forces is not a smart thing to do.... It does create an incentive for them to do things that are, so to speak, asymmetrical, that give them an advantage—terrorism, cruise missiles, ballistic missiles, cyberattack...."
—The Hon. Paul Wolfowitz, Deputy Secretary of Defense

We need to manage all aspects of our platforms' signatures. The Advanced Multifunction Radio Frequency Concept (AMRF-C) integrates radar, electronic warfare, and communications functions via common array apertures. We are pursuing other technologies for active or passive management of platform signatures. Detection of advanced low probability of intercept or detection sensors and low or very low observable threats against a cluttered background will become increasingly important, as will counter-sensor techniques and technologies.

- In FY 2003: AMRF-C version 1.
- In FY 2003-2006: EA Techniques-Counter Advanced Threat.
- In FY 2003-2007: HK/EW Techniques.
- In FY 2004: Missile Warning System.
- In FY 2004-2006: Ship-Based Infrared Search and Track. Hybrid RF/IR Sensors and Advanced Seeker Countermeasures.
- In FY 2005: Advanced Integrated Electronic Warfare System (AIEWS) Increment 2 EA P3I. Low Observable Integrated Deckhouse. EO/IR Self-Protection for Small Surface Vehicles. Small Platform Situation Awareness System.
- In FY 2005-2007: Electronics Technology Demonstrations.
- In FY 2006: AMRF-C version 2. Low Observable and Very Low Observable Technologies. ES Detection of LPI Periscope Detection Radar. End User Terminal++.
- In FY 2006-2007: Electro-Optical/Infrared Laser Jammer for Tactical Aviation.
- In FY 2006-2007: Small Platform EA System.
- In FY 2006-2007: Enhanced *Nulka* Payload for a multi-mode capability against emerging anti-ship missiles.
- In FY 2007: Shipboard Electro-Optical and Infrared Closed Loop Self-Protection.
- In FY 2006-2007: IDECM P3I.
- In FY 2007: Integrated Electro-Optical and Infrared Self-Protection Suite for Aircraft.

Transition opportunities:

- AMRF-C—transition to AIEW, DD-21, and CVNX in FY 03.
- Enhanced *Nulka*—transition to DDG-79, DD-21, and CG-21 in FY 09.

Third Priority: Ability to resist and control damage from weapons while preserving operational capability.

We need to suppress explosions, to control cascading damage, and to provide damage control through advanced sensors and automatic responses. Our ability to do so must improve even at the reduced manning levels of future platforms.

- In FY 2002: Real-time Damage Detection, Assessment and Response.
- In FY 2004: Passive Magazine Protection.
- In FY 2005: Dynamic Magazine Protection. Advanced Damage Countermeasures.
- In FY 2007: Damage Tolerant Advanced Double Hull.

Transition opportunities:

- Real-Time Damage Detection—transition to DD-21, DDG-51, and CVNX in FY 03.
- Passive Magazine Protection—transition to DD-21, CG-21, and other surface combatants in FY 05.
- Dynamic Magazine Protection—transition to CVNX in FY 06.

What's some of the sustaining discovery and invention science and technology?

Exploitation and delivery depend upon discovery and invention. In ONR's vertically integrated program, we will continue to exploit basic work that proves relevant to platform protection.

- ***Nanoelectronics*** will permit faster electronic devices and revolutionary circuit architectures, and ***Micro Electro-Mechanical System (MEMS)*** promise advances in sensors for large area external acoustic and electromagnetic arrays.
- ***Material science***—including work in ***wide bandgap semiconductors and devices***—will increase available solid state microwave power, efficiency, and linearity, and enhance platform survivability.
- An understanding of ***operational environments***—particularly developing s***tructural acoustic models*** that include the ocean free surface to model the radiation from surface ships—will continue to inform work on platform protection.
- ***Radio frequency architectures and technologies***—particularly ***radar cross section prediction*** models using ***hybrid finite element analysis***, ***physical theory of diffraction***, and ***electromagnetic scattering models***—will enable high fidelity predictions.
- ***Integrated hydrodynamic and propulsion system design*** will enable tactically significant stealth improvements while enhancing mobility especially in the littorals.