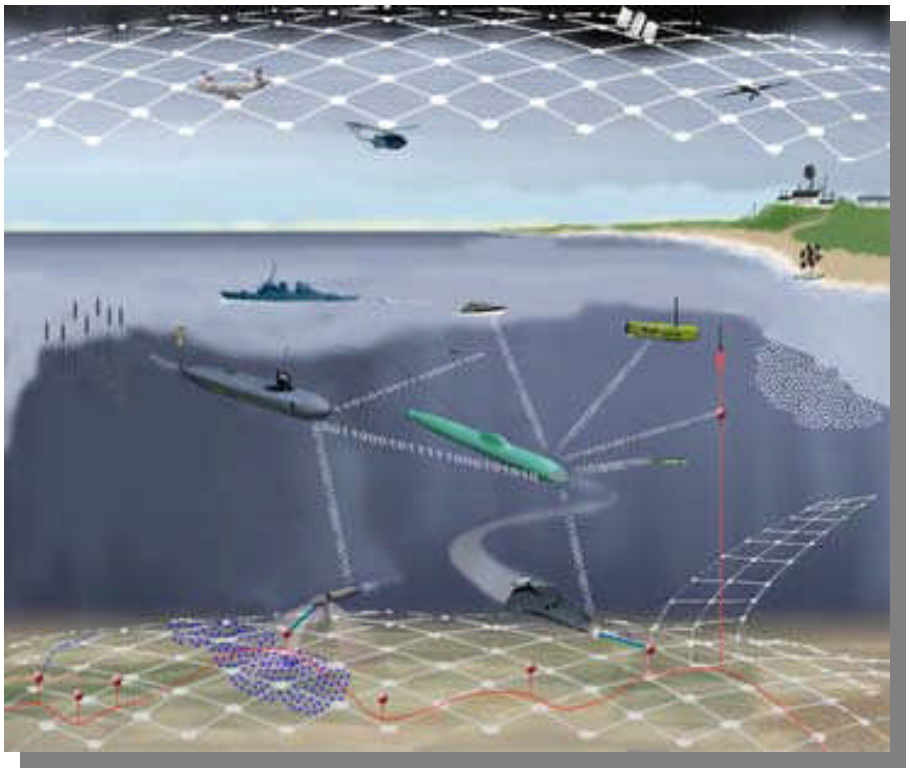
US Navy Maritime ISR Roadmap

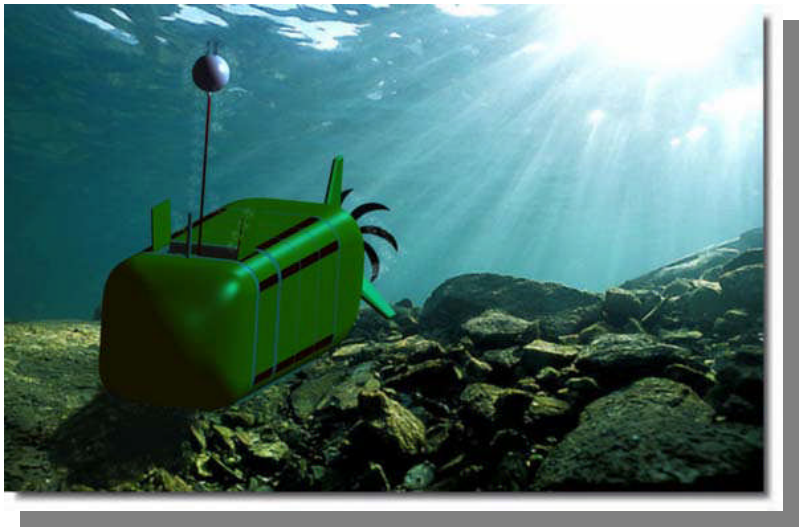


INDUSTRY DAY

June 22, 2010

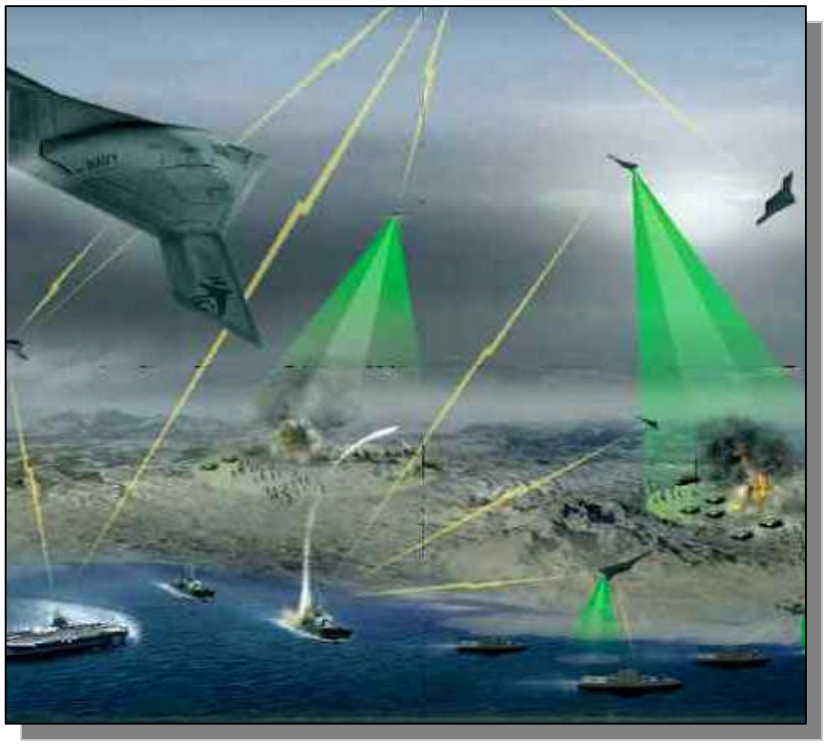
Agenda

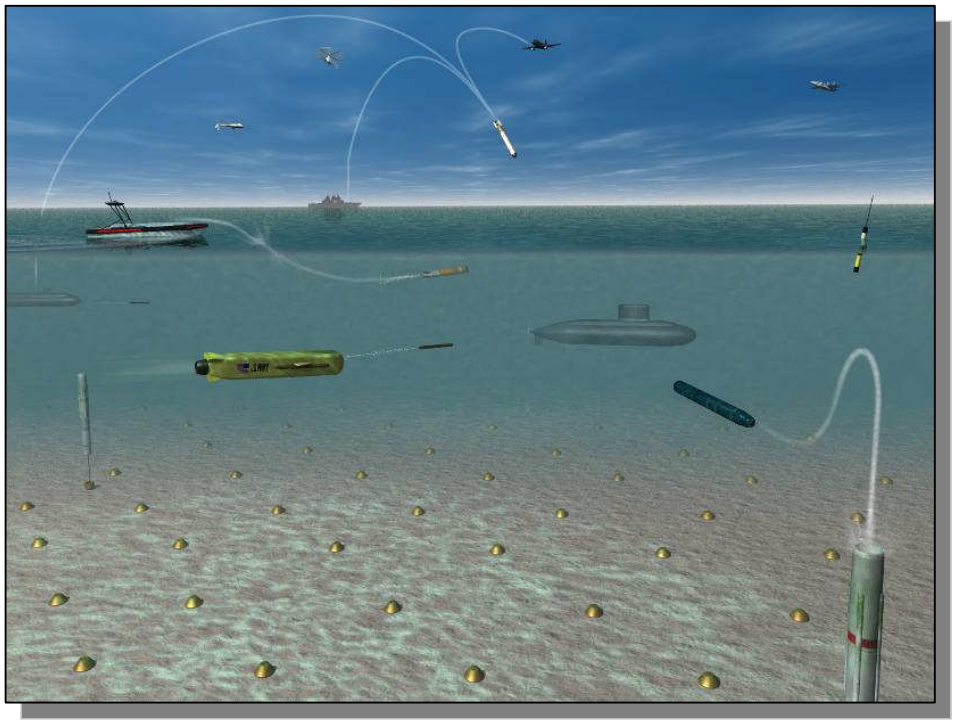
- Guidance
- Roadmaps
- Concepts and Vision
- Challenges



Guiding Principle for Navy ISR

Navy's ISR contribution is either from the sea — or, in those unique cases where it must be land-based — is to conduct a Maritime mission.
A Maritime focus is core to the Navy's ISR efforts



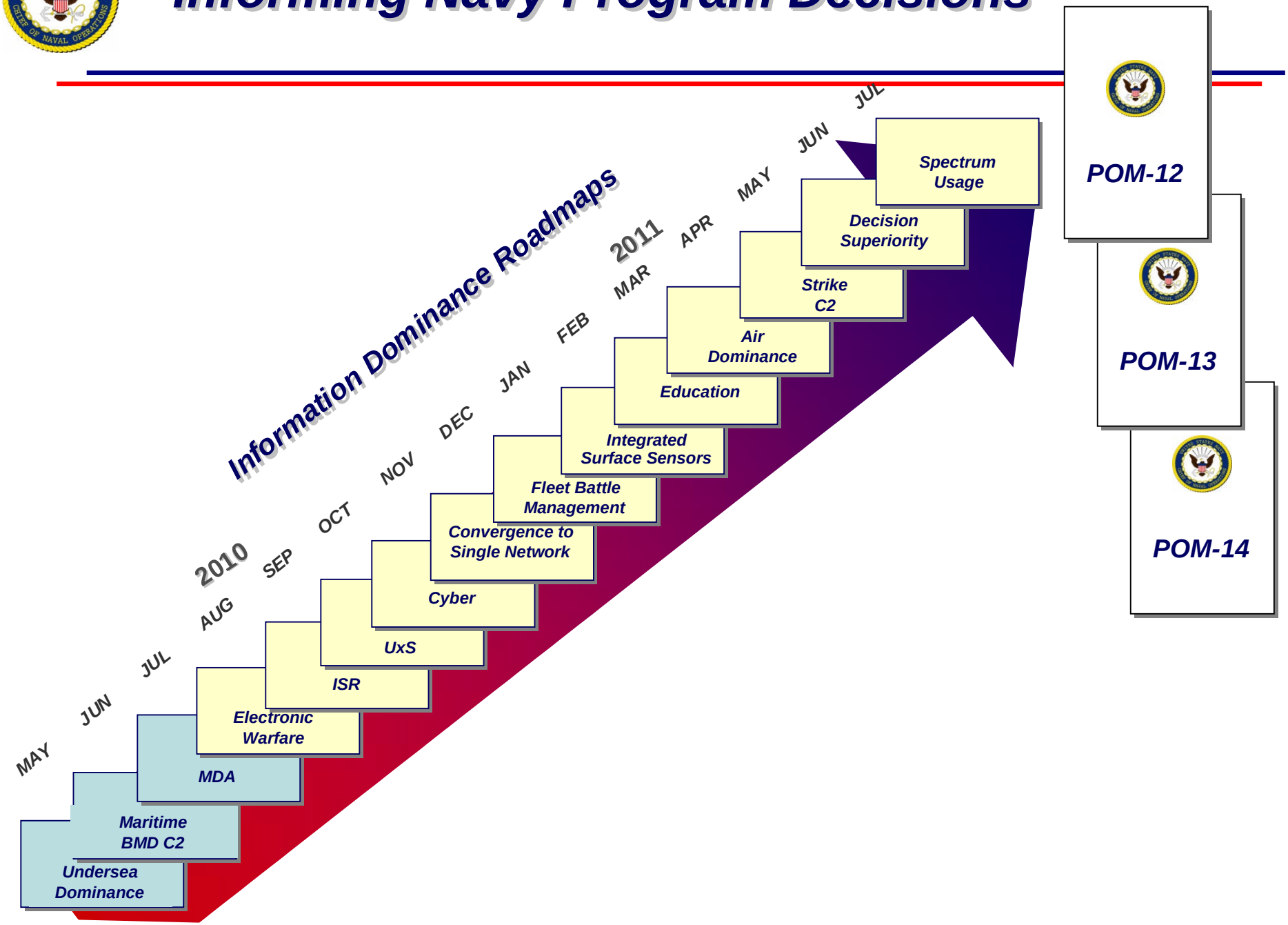


CNO's Unifying Vision and Guiding Principles

Vision - ***"Pioneer, field and employ game-changing capabilities to ensure Information Dominance over adversaries and Decision Superiority for commanders, operational forces and the nation"***

- First Principles Include:
  - ✓ Every platform is a sensor
  - ✓ Every sensor is networked
  - ✓ Build a little; test a lot
  - ✓ Spiral development/acquisition
  - ✓ Plug-n-play sensor payloads
  - ✓ Reduce afloat/airborne manning
  - ✓ Transition to remoted, automated
  - ✓ Collectors dynamically tasked
  - ✓ One operator controls multiple platforms
  - ✓ Emphasize UAS/RPV and autonomous platforms
  - ✓ UAS's increasingly sea-based
  - ✓ Data discoverable and accessible
  - ✓ Missions drive requirements
  - ✓ Commonality in interfaces, data links and control stations
  - ✓ Every shooter capable of using target data derived from any sensor

Informing Navy Program Decisions



Space

Intelligence Community Satellites

Aerial

P-8

Multi-Int P-8

BAMS UAS

BAMS Increment 3

F35

E-2D

NUCAS

UCLASS

STUAS

Fire Scout

Medium-Range Ship-Based UAV

Surface

SURTASS

Cobra Judy Replacement

Littoral USV Demo

HUMINT Teams

SSEE E/F/G on Ships

Sub-Surface

Arrays

Intel Gear on SSNs

SHARC or Glider UUV

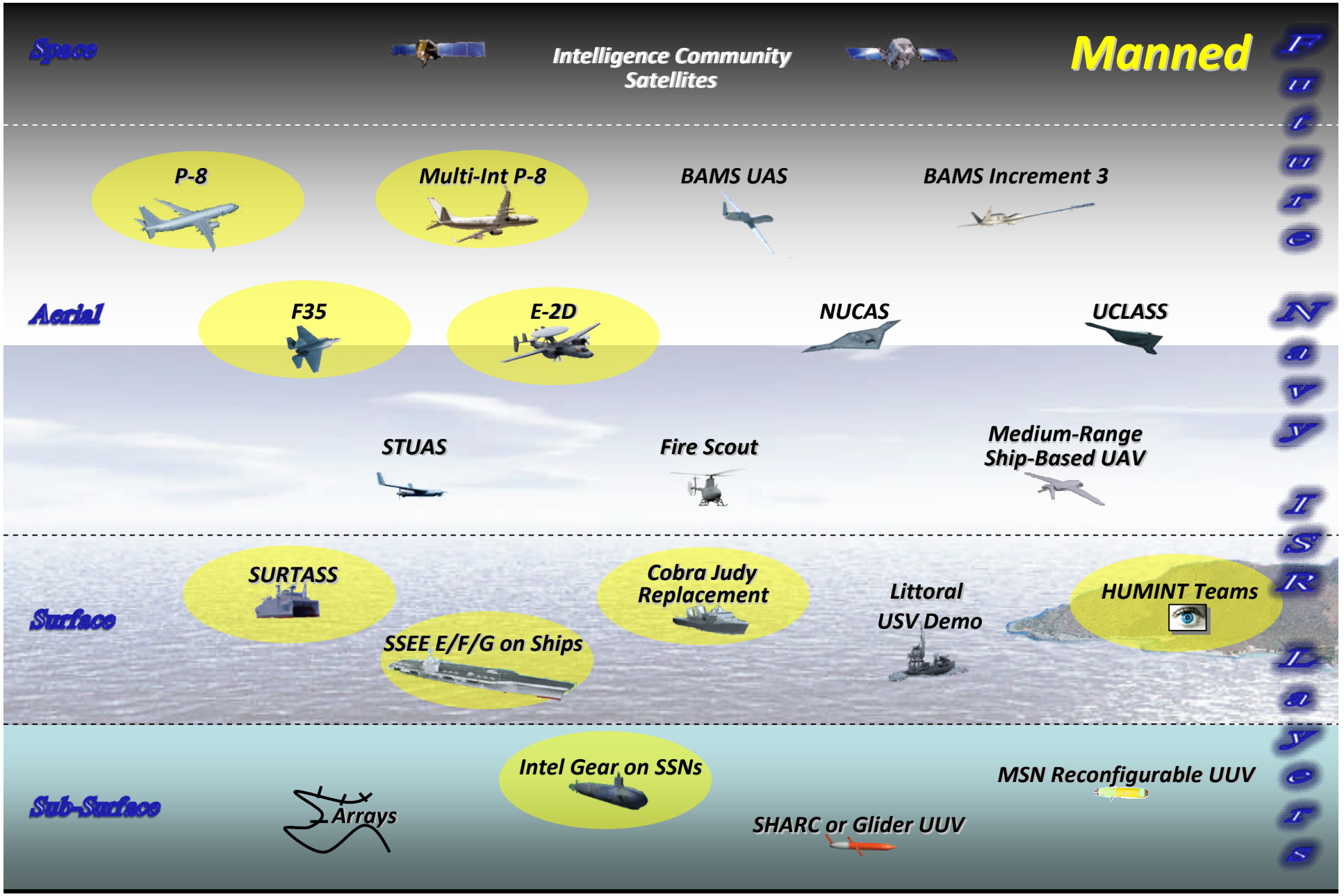
MSN Reconfigurable UUV

Future Navy ISR Layers

Foundation

Tasking/Queuing
Processing, Exploitation & Dissemination

- Intelligence Community
- National Maritime Intelligence Center
- Office of Naval Intelligence
- Maritime Operations Centers
- Navy Info Ops Centers
- Navy Oceanographic Processing Facilities
- Navy Criminal Investigative Service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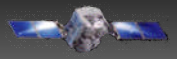
Unmanned

Future Navy ISR Layers

Space

Intelligence Community Satellites



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Vision for Unmanned Systems

- Integration and operation of unmanned systems in each domain the Navy operates to enhance capabilities
  - Manned platforms with UxS in different domains
- Seamless manned and unmanned systems integration
- Unmanned systems are compelling where the human is a limitation to mission success or a viable alternative to “traditionally” manned missions
- Common control systems and modular “plug and play” payloads within an open architecture = flexibility
  - One operator controls more than one vehicle in more than one domain
- Team with other Services and Agencies, our Allies, academia and industry to capitalize on emerging technology and to gain cost savings and synergy in order to increase warfighting capability

A Navy force that integrates manned and unmanned systems to increase capability across the full spectrum of maritime and littoral missions while remaining fiscally achievable.

-CNO

UUV ISR Roadmap
"Path to Persistence"

2011 2012 2013 2014 2015 2016 2017 2018 2019

Short Term:

Surface platform certifications

Real-world ISR missions

Operational Concept Maturation

Commercial Bottoming ISR LDUUV

Apply developmental lessons learned

Incorporate new power systems / payloads

Apply operational lessons learned

Revolution in UUV Capability

Long Term:

Technology Maturation

Real-world ISR missions

Submarine

Surface

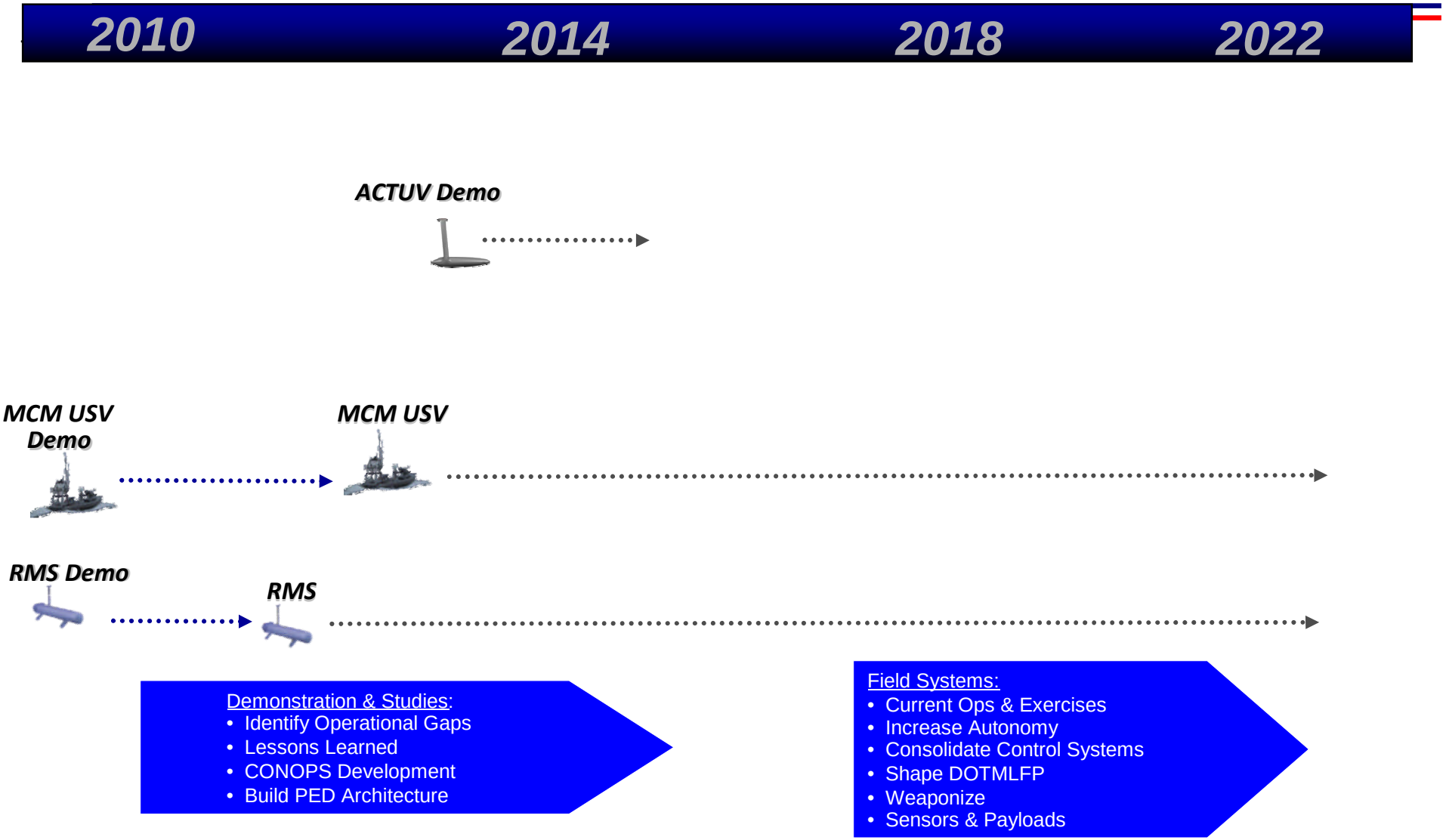
Launch platform certifications

High Endurance, Multi-Mission, Reconfigurable Navy LDUUV

Advanced Power / Battery Technology

Mission payload systems

Navy USV Convergence Roadmap



Challenges – How Industry Can Help

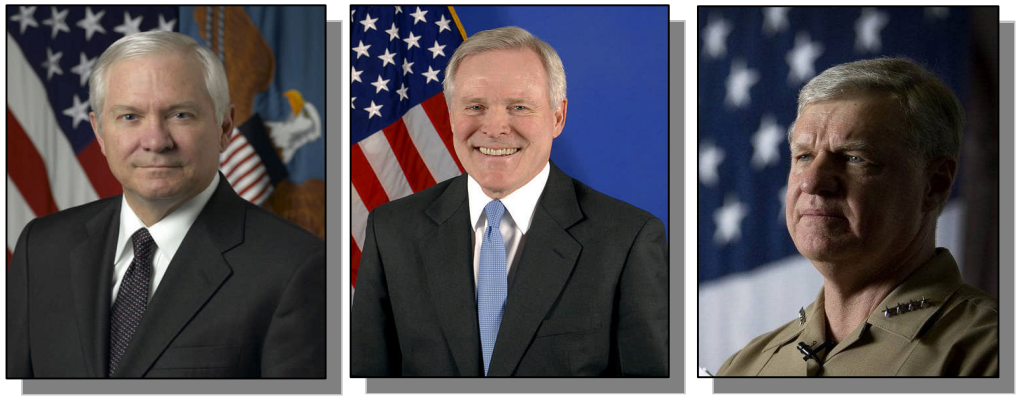
- **Sensor Mix/Adaptability**
  - Multi-INT Podded Sensors
  - Modular/Plug-and-Play
  - Networked/Automated cross-cueing/DF
  - Data Exfiltration & Tagging/Indexing
- **Autonomy**
  - Sense and Avoid technology
  - Self-cueing, auto-recognition/sorting
  - Self-optimizing
- **Penetration/Survivability**
  - Effective stand-off
  - Penetration capability
- **Platforms**
  - Energy, particularly for UUV systems
  - Rapid integration of pods, etc.
  - Potential for weaponization
  - Common Unmanned System Control Systems and Data Links

Questions?

BACK UP

Guidance

- **SECDEF Guidance for the Development of the Force**
  - Ensure **sea-based** mid-range **UAS** in two locations in **FY12**, including **sea-based** ISR for the National Mission Force
  - NLT FY15, conduct **CVN-based experiments** with **N-UCAS**
  - Assess the feasibility of accelerating IOC of **CVN-based unmanned** aircraft for **strike** and **ISR**



- **Unmanned Vehicles are SECNAV's No. 2 Priority**
- **CNO Direction**
  - Move Boldly:
    - Into **Unmanned**, machine autonomous technologies
    - Creating a Fully-Integrated Intel, C2, Cyber & Networks Capability
    - Improve **sea-based** mid-range **unmanned ISR** capability
    - Sustain PR-11 increases in long-range persistent **sea-based unmanned ISR and strike**

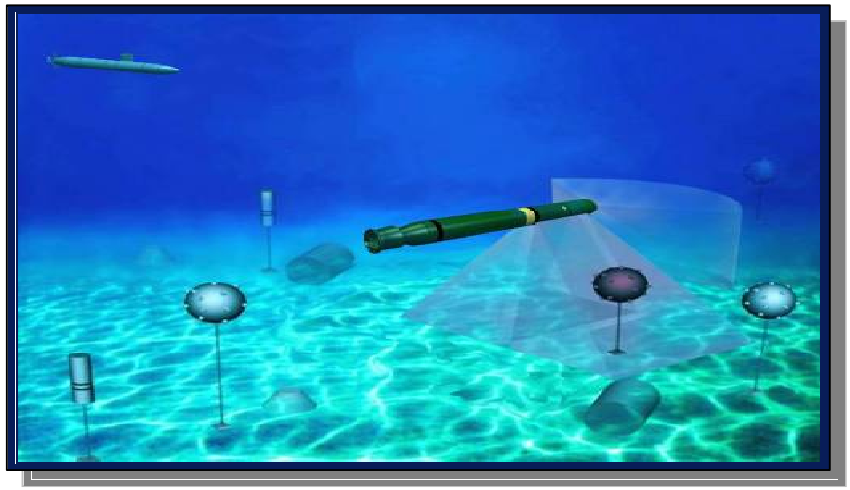
CNO Aspirations

Unmanned Air Capabilities

- Carrier-Based UAS 2018 (UCLASS)
- Sea-Based MRUAS

Undersea Sensing

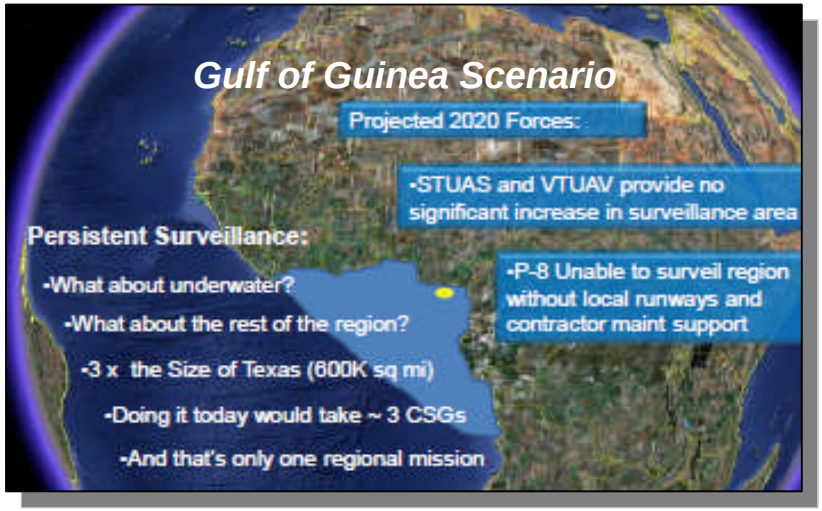
- UUV “fleet” by End of Decade
- Fund UUV Power & Endurance first then fund UUV Sensors, C3, Networks and Autonomy

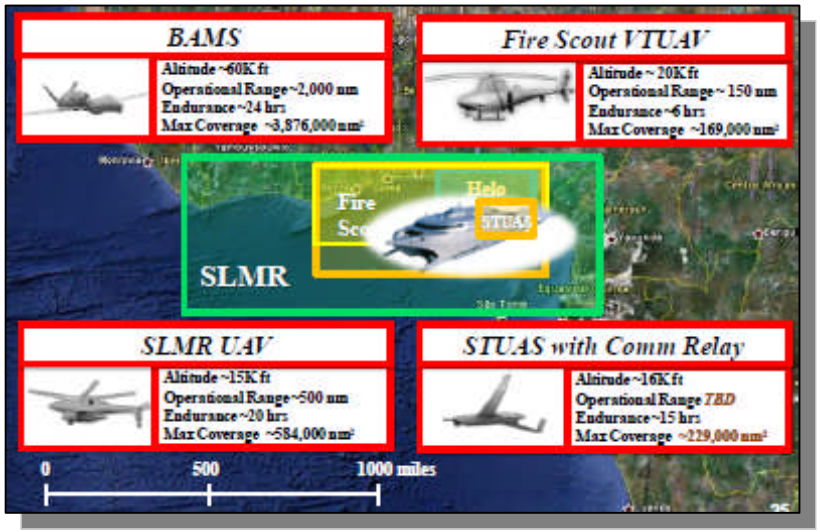


Source: CNO SPP Brief

SSG XXVIII Recommendations

- SSG XXVIII examined various scenarios and recommended Navy procure a ship-launched medium-range UAS to provide persistent surveillance
  - UAS would be unconstrained by the availability of local airports
  - UAS should have a ~1,000NM range, 12-24+ endurance, modular payload & be CVN launched/recovered





Expanded Reach for Sea-based Persistent Surveillance

Campaign Plan

- **Strategic Objectives:**
  - Distributed, flexible sensor networks
  - Integrated undersea information architecture with Navy networks and C2
  - Far-forward, long-duration surveillance
  - Underwater communications for OPS in SATCOM denied environment
- **Game changers:**
  - Increased power and endurance for UUV's and DNS
  - Clandestine, low-latency undersea communications
  - Automated processing and data fusion
  - Advanced visualization tools and decision aids

"We will seek out and embrace game changes and innovative solutions to current and future challenges, especially at the left of the kill chain."

CNO Guidance for 2009