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16th Annual Expeditionary Warfare Conference

"Integrating Future and Present Capabilities"

Panama City, FL

24 - 27 October 2011

Agenda

Monday, October 24, 2011

MINE WARFARE SESSION – "MIW - ALL AHEAD FULL"

OVERVIEW OF MINE WARFARE FOR THE FUTURE

- MajGen Timothy Hanifen, USMC, OPNAV N85, Director, Expeditionary Warfare Division

FUNDING GOALS FOR FUTURE MIW CAPABILITY

- LCDR Brian Amador, Surface Mine Counter Measures Requirement Officer, OPNAV N852

FUTURE OF MIW FROM THE LCS PLATFORM

- RDML James Murdoch, USN, PEO LCS

OFFENSIVE MINING CAPABILITY AS A GAME CHANGER

- Mr. Randy Hill, N8/9, Naval Mine and ASW Command

SHALLOW WATER MIW

- RDML Jonathan White, USN, Commander, Naval Meteorology and Oceanography Command

DEVELOPING MIW MISSION PACKAGE CAPABILITIES SOONEST FOR THE FLEET

- Mr. David B. Tubridy, Department Head, Littoral and Mine Warfare Systems, NSWC PCD

OFFENSIVE MINING

- Mr. Scott Burlison, NSWC PCD

Tuesday, October 25, 2011

KEYNOTE SPEAKER

- Mr. Brian Detter, Deputy Assistant Secretary of the Navy for Expeditionary Programs and Logistics Management, DASN, Expeditionary Programs and Logistics Management

EXWAR STRATEGIC OUTLOOK SESSION

- RDML (Sel) Dietrich H Kuhlmann, III, USN, Director, Operations Division, ASN(FM&C), FMB1/N821

- RDML Gerry Hueber, USN, Commander, Expeditionary Strike Group Three
- CAPT Mark Mullins, USN, Deputy Director, Irregular Warfare Office, OPNAV N3/5
- Col Bob "Brutus" Charette, Jr., USMC, Director, Marine Corps Expeditionary

EXWAR CURRENT OPERATIONS SESSION

BOLD Alligator

- BGen Christopher Owens, USMC, Deputy Commanding General, II MEF
- Col Brad Weisz, USMC, Deputy Commander, Expeditionary Strike Group TWO

Recent Afghanistan, Iraq, Pakistan, Libya deployment

- CAPT Pete Pagano, USN, COMPHIBRON FOUR
- Col Mark Desens, USMC, CO 26th MEU

Wednesday, October 26, 2011

KEYNOTE SPEAKER

- BGen Francis L. Kelley, Jr., USMC, Commanding General, Marine Corps Systems Command

EXW SYSTEM ACQUISITION CHALLENGES SESSION

- RDML David Lewis, USN, PEO SHIPS
- Col Gary "Static" Kling, USMC, Deputy for Aviation Programs, HQ USMC
- RDML James Murdoch, USN, PEO LCS

ONR/ADVANCE TECHNOLOGY SESSION

- Dr. Walter F. Jones, Executive Director, Office of Naval Research
- BGen Mark Wise, USMC, Vice Chief of Naval Research and Commanding General, Marine Corps Warfighting Lab (MCWL)
- RDML James Shannon, USN, Commander, Naval Surface Warfare Center
- Mr. George Solhan, SES, Deputy Chief of Naval Research, Expeditionary Maneuver Warfare & Combating Terrorism Department (Code 30); and Director, Marine Corps Science and Technology
- Tom Swean, Ph.D., Deputy Director, Ocean Battlespace Sensing Department (Code 32)
- CDR Matt Swiergosz, USN, Program Officer, Warfighter Performance Department (Code 34)

Thursday, October 27, 2011

BALANCING RESOURCES IN SUPPORT OF EXPEDITIONARY OPERATIONS SESSION

- Col Chris Arantz, USMC, Director, OPNAV N85, Seabasing Branch/Amphibious Warfare Branch
 - CAPT Evin Thompson, USN, N851, Special Warfare Branch
 - CDR Robert Debuse, USN, N857
 - LCDR Brian Amador, Surface Mine Counter Measures Requirement Officer, OPNAV N852
 - CAPT Henry Stevens, USN, PMS385, PM Mobile landing Platform (MLP) and Joint High Speed Vessel (JHSV)
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16th Annual
**EXPEDITIONARY
WARFARE CONFERENCE**



“Integrating Future and Present Capabilities”



OCTOBER 24 - 27, 2011

WWW.NDIA.ORG/MEETINGS/2700

WYNDHAM BAY POINT HOTEL, PANAMA CITY, FL

EVENT #2700

LOCATION

Wyndham Bay Point Hotel
4114 Jan Cooley Drive
Panama City Beach, FL 32408
(800) 874-7105

CONFERENCE ATTIRE

Appropriate dress for the conference is business casual for civilians and Class B uniform or uniform of the day for military personnel.

PIG ROAST

Appropriate attire for the Pig Roast held at the NSWC PCD Base is casual dress. Please note that the event is held in an open air facility and the temperature can be cold. To attend the Pig Roast, you must have your conference badge that you would have received at registration. Please bring a valid picture ID and your conference badge to board the bus bound for NSWC PCD.

ID BADGES

During conference registration and check-in, each Attendee will be issued an identification badge. Please be prepared to present a valid picture ID. Badges must be worn at all conference functions.

PROCEEDINGS

Conference proceedings will be available online approximately two weeks after the event. You will receive an e-mail notification once the proceedings are available for viewing.

MONDAY, OCTOBER 24, 2011

8:00AM - 1:00PM

Golf Tournament

Nicklaus Golf Course & Club House

12:00PM - 7:00PM

Conference Registration

St. Andrews Foyer

2:30PM - 5:30PM

Mine Warfare Session – “MIW - All Ahead Full”

St. Andrews Ballroom

Naval mine warfare capability has been like the fashionable length of skirts – sometimes it is up and sometimes it is down. Our current mine countermeasures capability has received considerable attention over the past decade with a number of highly capable systems being fielded. The U.S. Navy mining capability, however, has been allowed to remain in the shadows with the result that the offensive mining capability has fallen to the level that our potential enemies now do not view U.S. Navy offensive mining as a deterrent, yet they maintain or enhance their own offensive mining capability. The recent mining incident in Libyan waters serves as a reminder of the effectiveness of very simple mines. The U.S. Navy is moving toward a more integrated capability through the use of the LCS mission modules with the subsequent cost savings related to reduction in the dedicated MCM vessel capability. It is our goal in this Session to explore future MIW, both Mining and Mine Countermeasures, with Speakers representing the fleet operators, the resource sponsor, the acquisition branch, and the technical groups. Specific areas addressed will include funding for support of a renewed offensive mining capability and the impact of the new PEO, LCS on MIW capability to move Mine Warfare “All Ahead Full.”

Session Chair: RADM Chuck Horne, USN (Ret)

Overview of Mine Warfare for the Future

▶ MajGen Timothy Hanifen, USMC, OPNAV N85, Director, Expeditionary Warfare Division

Funding Goals for Future MIW Capability

▶ LCDR Brian Amador, Surface Mine Counter Measures Requirement Officer, OPNAV N852

Future of MIW from the LCS Platform

▶ RDML James Murdoch, USN, PEO LCS

Offensive Mining Capability as a Game Changer

▶ Mr. Randy Hill, N8/9, Naval Mine and ASW Command

Shallow Water MIW

▶ RDML Jonathan White, USN, Commander, Naval Meteorology and Oceanography Command

Developing MIW Mission Package Capabilities Soonest for the Fleet

▶ Mr. David B. Tubridy, Department Head, Littoral and Mine Warfare Systems, NSWC PCD

Offensive Mining

- ▶ CAPT Scott Burleson, USNR, NSWC PCD

6:00PM - 7:00PM

Reception (Hosted Beer & Wine Bar; Liquor for Purchase)
St. Andrews & Grand Lagoon Foyers

7:00PM - 9:00PM

Dinner with Guest Speaker
Grand Lagoon Ballroom
▶ Gen James Jones, USMC (Ret), Former Commandant of the Marine Corps and National Security Advisor; President, Jones Group Consulting

TUESDAY, OCTOBER 25, 2011

6:45AM - 4:30PM

Conference Registration
St. Andrews Foyer

6:45AM - 7:30AM

Continental Breakfast
St. Andrews & Grand Lagoon Foyers

7:30AM - 8:00AM

Welcome & Introductory Remarks
St. Andrews Ballroom
▶ CAPT Duane Covert, USN (Ret), Expeditionary Warfare Division Conference Chairman; Site Manager, Northrop Grumman Corporation Information Systems
▶ VADM James Amerault, USN (Ret), Expeditionary Warfare Division Chairman; President and CEO, Oto Melara North America, Inc.
▶ Col Tom Owens, USAF (Ret), VP Membership, NDIA
▶ CAPT Scott Pratt, USN, CO NSWC PCD

8:00AM - 9:00AM

Keynote Speaker
St. Andrews Ballroom
▶ Mr. Brian Detter, Deputy Assistant Secretary of the Navy for Expeditionary Programs and Logistics Management, DASN, Expeditionary Programs and Logistics Management

9:00AM - 9:30AM

Networking Break
St. Andrews & Grand Lagoon Foyers

9:30AM - 11:30AM

EXWAR Strategic Outlook Session
St. Andrews Ballroom

Every aspect of the global environment has an impact on defense planning. Changes in one factor prompt decisions that cause inevitable adjustments in the overall defense posture. The Strategic Overview Session is designed to examine the impact of four of the most significant issues that shape the *art of the possible* in the development of present and future expeditionary warfare capabilities: defense budget, operational environment, requirements for irregular warfare and counter-terrorism, and energy management. Each of the panelists has responsibilities in assessing and responding to one or more of these issues within the decision-making process that shapes expeditionary warfare forces.

CONFERENCE CONTACTS

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Session Chair: Dr. Sam Tangredi, Director, San Diego Operations, Strategic Insight, Ltd.

- ▶ RDML (Sel) Dietrich H Kuhlmann, III, USN, Director, Operations Division, ASN(FM&C), FMB1/N821
- ▶ RDML Gerry Hueber, USN, Commander, Expeditionary Strike Group Three
- ▶ CAPT Mark Mullins, USN, Deputy Director, Irregular Warfare Office, OPNAV N3/5
- ▶ Col Bob "Brutus" Charette, Jr., USMC, Director, Marine Corps Expeditionary Energy Office

11:30AM - 12:45PM **Networking Lunch**
Grand Lagoon Ballroom

12:45PM - 1:30PM **Guest Speaker**
St. Andrews Ballroom
▶ VADM Richard W. Hunt, USN, Commander, Naval Surface Forces, U.S. Pacific Fleet

1:30PM - 4:30PM **EXWAR Current Operations Session**
St. Andrews Ballroom

As it has been in all wars, equipment, training, concepts and plans change as the war progresses. Some of the prior or current concepts, plans and equipment work and some do not. The Session will discuss current and recently past operations with a focus on how USMC and Navy forces are currently operating and training. The intent is to discuss, examine and raise questions on what concepts of operations work, what specific systems or equipment effectively support current and future concepts, what capabilities are effective, which capabilities or systems are not effective, and what capabilities or capability improvements the operating units need that they do not have today. Current operational leaders will speak on these issues from either their recent experience in preparing units to deploy, in operations, or in capability development.

Session Chair: Mr. Dewey Mauldin, Vice President, The Boeing Company

BOLD Alligator
▶ BGen Christopher Owens, USMC, Deputy Commanding General, II MEF
▶ Col Brad Weisz, USMC, Deputy Commander, Expeditionary Strike Group TWO

Recent Afghanistan, Iraq, Pakistan, Libya deployment
▶ CAPT Pete Pagano, USN, COMPHIBRON FOUR
▶ Col Mark Desens, USMC, CO 26th MEU

2:30PM - 3:00PM **Networking Break**
St. Andrews & Grand Lagoon Foyers

3:00PM - 4:30PM **Session Continues**
St. Andrews Ballroom

4:30PM **Adjourn**

WEDNESDAY, OCTOBER 26, 2011

6:45AM - 4:45PM **Conference Registration**
St. Andrews Foyer

6:45AM - 7:45AM **Continental Breakfast**
St. Andrews & Grand Lagoon Foyers

7:45AM - 8:00AM **Administrative Remarks**
St. Andrews Ballroom

8:00AM - 8:45AM **Keynote Speaker**
St. Andrews Ballroom
▶ BGen Francis L. Kelley, Jr., USMC, Commanding General, Marine Corps Systems Command

8:45AM - 11:50AM

EXW System Acquisition Challenges Session

St. Andrews Ballroom

“Being ready is not what matters. What matters is winning after you get there.”

LtGen Victor H. Krulak, USMC, April 1965

The presentations and discussions will discuss some of the most important acquisition programs that enable both current and future expeditionary warfare and the various challenges faced. Getting it right is even more difficult with the challenges of budget constraints imposed, and pending due to our nation's need for deficit reduction. With global threats from state and non-state factions increasing and changing, providing the technological advantages that continue to make war with the United States an unfair fight, the programs presented today are pivotal.

Session Chair: Mr. Jeff Steelman, Vice President, The Steelman Group, Inc.

Moderator: Mr. Terry O'Brien, CAPT, USN (Ret), Corporate Director for Customer Relations, Ingalls Shipbuilding, Huntington Ingalls Industries

- ▶ RDML David Lewis, USN, PEO SHIPS
- ▶ Col Gary “Static” Kling, USMC, Deputy for Aviation Programs, HQ USMC
- ▶ RDML James Murdoch, USN, PEO LCS

9:50AM - 10:20AM

Networking Break

St. Andrews & Grand Lagoon Foyers

10:20AM - 11:50AM

Session Continues

St. Andrews Ballroom

12:00PM - 1:30PM

Lunch with Guest Speakers

Grand Lagoon Ballroom

- ▶ MajGen Timothy Hanifen, USMC, OPNAV N85, Director, Expeditionary Warfare Division, CMC Representative
- ▶ RADM Kurt W. Tidd, USN, Commander, U.S. Naval Forces Southern Command; Commander, U.S. 4th Fleet, CNO Representative

1:30PM - 4:45PM

ONR/Advance Technology Session

St. Andrews Ballroom

The Office of Naval Research (ONR) provides technology solutions for Navy and Marine Corps needs, especially in the area of Expeditionary Warfare. ONR manages the Navy's basic, applied, and advanced research to foster transition from science and technology to higher levels of research, development, test and evaluation. Working closely with ONR is the Marine Corps Warfighting Laboratory (MCWL), which creates technological and strategic advances in response to the needs of today's Marine in order to provide timely and exacting responses to their current needs and future threats. As well, the Naval Surface Warfare Center (NSWC) cohesively and seamlessly operates in concert with ONR concerning the development and transition of the technological advances into the platforms that our Navy operates in the expeditionary environment. The panel will discuss ongoing efforts to support the expeditionary warfighter through research of new technologies, and express the areas in which further research is desired by the expeditionary community.

Session Chair: Mr. Brian McGovern, Col, USMC (Ret), JLTV and MPF Project Officer, Professional Analysis, Inc.

1:30PM - 2:00PM

- ▶ Dr. Walter F. Jones, Executive Director, Office of Naval Research

2:00PM - 2:30PM

- ▶ BGen Mark Wise, USMC, Vice Chief of Naval Research and Commanding General, Marine Corps Warfighting Lab (MCWL)

2:30PM - 3:00PM

- ▶ RDML James Shannon, USN, Commander, Naval Surface Warfare Center

3:00PM - 3:15PM

Networking Break

St. Andrews & Grand Lagoon Foyers

3:15PM - 4:45PM

Session Continues

St. Andrews Ballroom

- ▶ Mr. George Solhan, SES, Deputy Chief of Naval Research, Expeditionary Maneuver Warfare & Combating Terrorism Department (Code 30); and Director, Marine Corps Science and Technology
- ▶ Tom Swean, Ph.D., Deputy Director, Ocean Battlespace Sensing Department (Code 32)
- ▶ CDR Matt Swiergosz, USN, Program Officer, Warfighter Performance Department (Code 34)

5:00PM - 7:00PM **NSWC PCD Open House & Networking Reception**
NSWC PCD (Transportation Provided)

7:00PM - 10:00PM **Pig Roast**
NSWC PCD

THURSDAY, OCTOBER 27, 2011

7:00AM - 12:10PM **Conference Registration**
St. Andrews Foyer

7:00AM - 7:45AM **Continental Breakfast**
St. Andrews & Grand Lagoon Foyers

7:45AM - 7:50AM **Administrative Remarks**
St. Andrews Ballroom
▶ Mr. Skip Gaskill, Director, Government Affairs, Textron, Inc

7:50AM - 8:35AM **Keynote Speaker**
St. Andrews Ballroom
▶ BGen Daniel J. O'Donohue, USMC, Director, Capabilities Development Directorate

8:35AM - 11:40AM **Balancing Resources in Support of Expeditionary Operations Session**
St. Andrews Ballroom

The 2012 Defense Budget recommendation is a continuation of the 2011 Defense Budget which focused on balancing ever shrinking resources amongst programs that support the full range of military operations. Difficult decisions have to be made to ensure the Navy/Marine Corps team can execute both conventional and irregular operations in the Joint Operating Environment. This Session will provide insight into the Navy and Marine Corps' resource allocations intended to meet the Secretary's intent within the scope of expeditionary operations. The Session Members are the resource sponsors (N85) and requirements developers (CD&I) who are making the funding recommendations and decisions for these programs of record.

Session Chair: Mr. Skip Gaskill, Director, Government Affairs, Textron, Inc.

Moderator: MajGen Thomas Benes, USMC (Ret), Vice President Expeditionary Warfare, Alion Science and Technology

- ▶ Col Chris Arantz, USMC, Director, OPNAV N85, Seabasing Branch/Amphibious Warfare Branch
- ▶ CAPT Evin Thompson, USN, N851, Special Warfare Branch
- ▶ CDR Robert Debuse, USN, N857
- ▶ LCDR Brian Amador, Surface Mine Counter Measures Requirement Officer, OPNAV N852
- ▶ CAPT Henry Stevens, USN, PMS385, PM Mobile landing Platform (MLP) and Joint High Speed Vessel (JHSV)

9:25AM - 9:55AM **Networking Break**
St. Andrews & Grand Lagoon Foyers

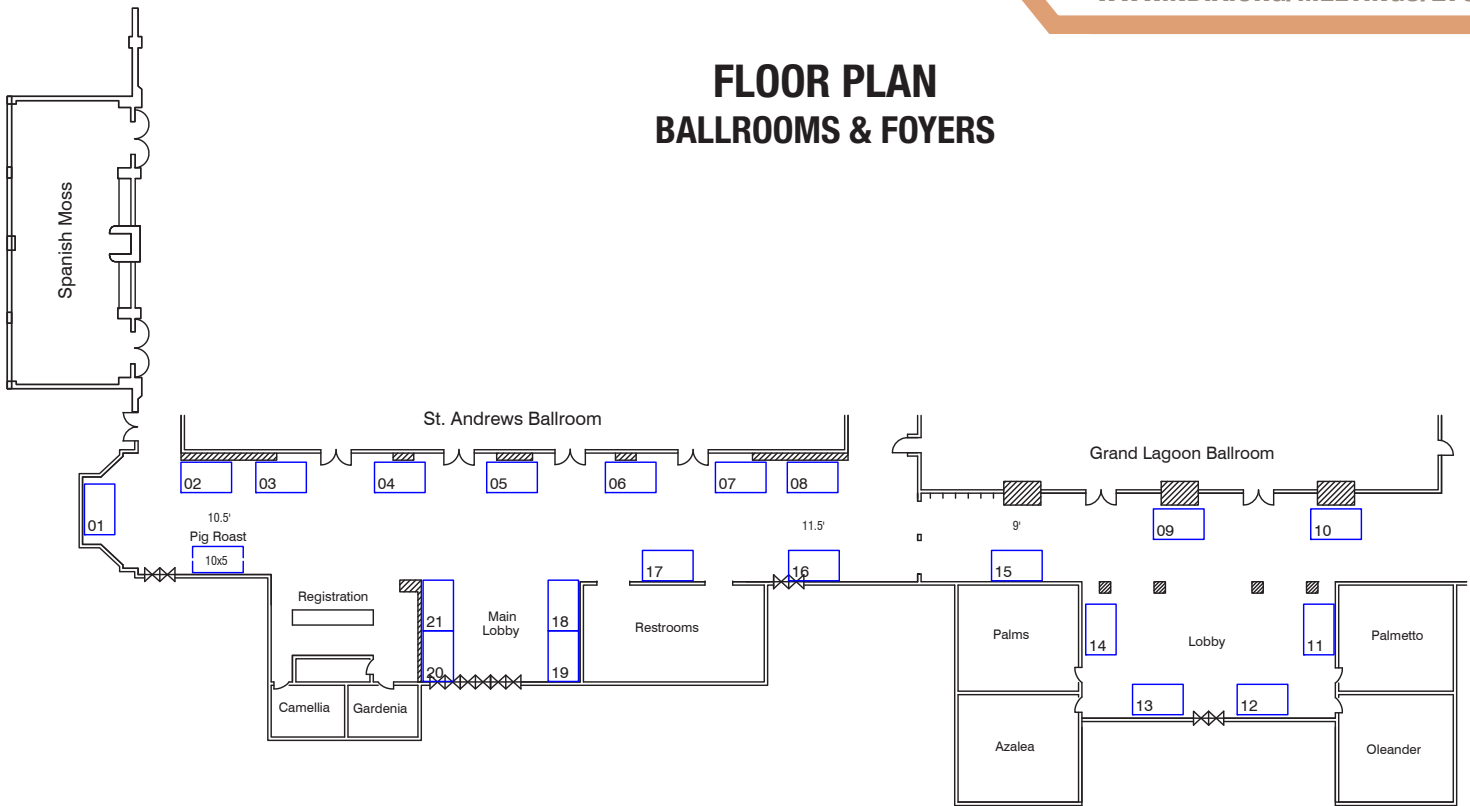
9:55AM - 11:40AM **Session Continues**
St. Andrews Ballroom

11:40AM - 11:55AM **Closing Comments**
St. Andrews Ballroom
▶ MajGen Timothy Hanifen, USMC, OPNAV N85, Director, Expeditionary Warfare Division

11:55AM - 12:05PM **Conference Closing Remarks/Adjournment**
▶ CAPT Duane Covert, USN (Ret), Expeditionary Warfare Division Conference Chairman; Site Manager, Northrop Grumman Corporation Information Systems

12:10PM **Boxed Lunch**
St. Andrews & Grand Lagoon Foyers

FLOOR PLAN BALLROOMS & FOYERS



Display #	Organization/Company	Display #	Organization/Company
1	NSWC PCD	12	Real Time Analyzers, Inc.
2	Northrop Grumman	13	GE Marine
3	EPS Corporation	14	Marport Canada, Inc.
4	Ingalls Shipbuilding	15	MCCDC
5	Weatherhaven Resources, Inc.	16	The Boeing Company
6	Oceaning International, Inc.	17	OPNAV N85
7	Hydroid, Inc.	18	General Dynamics Land Systems
8	DRS Defense Solutions	19	Arete Associates
9	Military Sealift Command	20	Rolls-Royce
11	Power Ten, Inc.	21	Maersk Line, Limited

DISPLAYER DESCRIPTIONS

AUSTAL

Austal's U.S. shipyard occupies 120 acres in Mobile, Alabama on the Mobile River, 20 miles from the Gulf of Mexico.

Austal performs modular construction in the Module Manufacturing Facility (MMF). The MMF houses an 8.5-acre, manufacturing facility with two production lines. The facility is supplemented by a 1.7-acre warehouse and parking for over 2,000 vehicles. The Final Assembly Yard consists of four large assembly bays for module fabrication/erection and component storage.

In 2004, the Navy awarded a contract for the Littoral Combat Ship (LCS) to Bath Iron Works. Austal was the LCS 127-meter trimaran seaframe designer and builder for the first two Independence-variant LCS class vessels.

USS Independence was built at Austal's shipyard and delivered in December 2009. A contract for Coronado was awarded by the Navy in May 2009 and in December 2010, the Navy awarded Austal a 10-ship, \$3.5B LCS contract.

In November 2008, Austal was awarded a Navy contract to design and construct the first 103-meter Joint High Speed Vessel (JHSV), with options for 9 additional. Construction on Spearhead began in December 2009. In September 2010, Austal started construction on Vigilant and is now under contract to build five of the remaining eight optioned vessels.

THE BOEING COMPANY

Nearly a century of expertise and continuing innovation make Boeing the leader in the aerospace and defense industry. Boeing combines global resources and a spirit of innovation to provide best-of-industry, network-enabled solutions to military, government and commercial customers around the world.

From battle-proven aircraft, unmanned vehicles, space systems and beyond, Boeing is the world's leading space and defense business and the world's largest and most versatile manufacturer of military aircraft. Boeing also is the world's largest satellite manufacturer, an emerging leader in support systems and services, and a leading global supplier of human space exploration systems and services.

DRS DEFENSE SOLUTIONS

DRS Defense Solutions, a wholly-owned subsidiary of DRS Technologies, is a best-in-class provider of advanced products, services and systems integration to military forces, intelligence agencies and prime contractors. The company is part of Finmeccanica Group (FNC.MI), which ranks among the top 10 global players in aerospace, defense and security, employing more than 75,000 people. To learn more, go to: www.drs-ds.com

EPS CORPORATION

EPS Corporation is built on a foundation of integrity and reliability and is dedicated to providing the best in professional services in support of the federal government, its military and civilian agencies worldwide including the austere environments of Bosnia, Kosovo, Iraq and Afghanistan. EPS is a Service Disabled Veteran Owned Small Business (SDVOSB).

EPS engineers and manufactures advanced composite EPS Hovercraft. The EPS M10 is a fully amphibious, air-cushioned vessel that operates effectively at sea, in shallow waters and over any land surface. The vessel has several variants: patrol, troop transport, logistics, emergency, humanitarian, hydrographic survey and ferry. The EPS M10 is constructed from non-corrosive, environmentally friendly advanced composites which provide a significant reduction in vessel operating, maintenance, and through-life costs. The EPS M10 is powered by two 1,000 horsepower diesel engines which provide it with lift and the operation of its propellers, giving speeds up to 50 knots and measures some 68 feet in length by 30 feet of beam. She has an all up weight in the region of 35 tons. The EPS M10 is produced under an ABS Hovercraft license agreement at EPS' Vectorworks Marina Shipyard in Titusville, Florida, USA.

POC: Francesco A. Musorrafti, Hovercraft@epscorp.com, www.epscorp.com

GE MARINE

GE Marine manufactures aeroderivative gas turbine marine engines ranging from 4.2 to 42.5 MW output. More than 1300 of these engines power nearly 500 ships in 32 world navies and on commercial vessels. These engines have accumulated more than 13.5 million operating hours. In the U.S. Navy, GE Marine engines propel corvettes, frigates, destroyers, supply ships, sealift ships and the new LCS s.

GE Marine's new GE38 7500 shp class engine is a candidate for propelling the Navy and marine Corps' new Ship-to-Shore connectors. This engine, already selected for the Sikorsky CH-53H helicopter, is being developed for Sikorsky and the Navy. It can also be used in a turbine-generator set for more efficient on-board on DDGs and future Navy ships.

Known for their outstanding fuel economy, reliability, GE Marine Engines have been serving the Navy for nearly half a century.

GENERAL DYNAMICS LAND SYSTEMS

General Dynamics Land Systems' mission is to provide a full spectrum of land and amphibious combat systems, subsystems and components worldwide. Our strengths are world-class design and systems integration, superior production and innovative life cycle support. We will deploy these strengths to meet our customers' needs in a changing world.

HYDROID, INC.

Hydroid, Inc., A Kongsberg Company, makers of the REMUS family of AUVs, is the world leader in AUV manufacturing. Located on Cape Cod, Hydroid has delivered more AUV of all classes, shallow to deep, than any other AUV organization. The combat proven REMUS 100, also known as the MK 18 MOD I Swordfish, SAHRV, and SCULPIN, is the AUV of choice by EOD and MCM forces around the globe. For more endurance and deeper depths Hydroid offers the REMUS 600 with Synthetic Aperture Sonar, Side Scan Sonar, Multi-Beam, and Camera options. The U.S. Navy's EOD version of the REMUS 600 is designated MK 18 MOD II Kingfish. Need to find something near the bottom of the ocean? The REMUS 6000 is the answer. Recently used to locate the debris field from Air France Flight 447, the REMUS 6000 is the deepest commercially available AUV in the industry.

Hydroid is a proud member of the Kongsberg family. Together with our Kongsberg team, we offer the HUGIN AUV equipped with the high resolution HiSAS, Synthetic Aperture Sonar, Minesniper mine neutralization system, a full range of world class acoustic sensors, and synthetic training.

Innovative, Determined, Collaborative, Reliable

Call or email today: (508) 563-6565, epetrick@hydroid.com

INGALLS SHIPBUILDING

Ingalls Shipbuilding is a division of Huntington Ingalls Industries. Ingalls Shipbuilding has pioneered the development and production of technologically advanced, highly capable warships for the surface Navy fleet, U.S. Coast Guard, U.S. Marine Corps, and foreign and commercial customers.

Facts at a Glance:

- 18,000 employees at three sites across the Gulf Coast plus subsidiaries in San Diego, CA and Virginia Beach, VA
- Building four classes of ships simultaneously—eight ships now in production
- DDG 113 will be the 29th Arleigh Burke-class destroyer built by Ingalls Shipbuilding
- Builder of record for LPD and LHA classes of amphibious assault ships
- Builder of largest multi-mission National Security Cutter for the U.S. Coast Guard
- Only "Composite Center of Excellence" facility in U.S. shipbuilding – building major components for LPD and DDG 1000

For more information, please visit: www.huntingtoningalls.com/is

MAERSK LINE, LIMITED

Maersk Line, Limited (MLL) is an American company, headquartered in Norfolk, VA, that provides U.S. flag transportation, ship management and maritime technical services to government and commercial customers.

In 1983, MLL won its first government contract to convert and operate five Maritime Prepositioning Ships (MPS). We have more than 25 years of experience managing minor and complex conversions for numerous ships. Our innovative concepts are affordable and reliable for the U.S. military's unique seabasing requirements.

MCCDC

Headquarters Marine Corps, Combat Development and Integration, Seabasing Integration Division, develops and enables the integration of maritime expeditionary capability and concepts for the Marine Corps. Seabasing Integration Division has four branches. The Expeditionary Ships Capabilities Branch identifies afloat requirements based on warfighting function and emerging concepts. The MAGTF Planning Branch develops and maintains the baseline MAGTF structure and modeling tools used for the purposes of war games, studies and analysis. The Connectors and Doctrine Branch develops and maintains Marine Corps' equities in crafts, connectors and doctrine in support of amphibious and expeditionary operations. The Operations Branch coordinates the division battle rhythm by maintaining the common operating picture. Seabasing Integration Division is located at Quantico, VA.

MARPORT CANADA, INC.

Marport, the largest sonar company in Canada, is the leading developer of Software Defined Sonar – the industry's first frequency agile, multi-mode, dynamically reconfigurable sonar transceiver platform using FPGA technology. Software Defined Sonar increases sonar functionality, enhances signal processing and substantially reduces costs – all while replacing racks of legacy sonar equipment.

MILITARY SEALIFT COMMAND

Military Sealift Command, headquartered in Washington, DC, provides ocean transportation to the Department of Defense and pivotal support to U.S. expeditionary warfighters worldwide.

The Command operates more than 110 government-owned and commercially chartered noncombatant ships that perform a variety of missions. These include replenishing U.S. Navy ships at sea; conducting specialized seagoing missions, strategically prepositioning combat cargo at sea for the rapid delivery to troops ashore; and delivering military equipment and supplies to deployed U.S. forces.

MSC support to expeditionary warfare includes: modern high-speed vessels that support Theater Security Cooperation and Global Fleet Station missions around the globe; ships that are specially configured to support sea basing; an offshore petroleum distribution system ship that enables petroleum to be piped ashore from several miles offshore; and integration with the development of the Maritime Prepositioning Force (Future).

NSWC PCD

The mission of Naval Surface Warfare Center Panama City Division (NSWC PCD) is to conduct research, development, test and evaluation (RDT&E), and in-service engineering (ISE) support of mine warfare systems, mines, naval special warfare systems, diving and life support systems, amphibious/expeditionary maneuver warfare systems, other missions that occur primarily in coastal (littoral) regions and to execute other responsibilities as assigned by the Commander, Naval Surface Warfare Center. Located on St. Andrew Bay in Panama City, Florida, NSWC PCD is the Navy's principal organization responsible for RDT&E in its mission areas and other missions that take place in the coastal region. By virtue of its geographical location on the Gulf of Mexico and the Department of Defense's Joint Gulf Test Range and coupled with its recognized mission areas and technical expertise, the Division is a leading contributor in developing, fielding, and testing Joint expeditionary and coastal operations systems in the littoral environment.

NORTHROP GRUMMAN

Northrop Grumman is a leading global security company providing innovative systems, products and solutions in aerospace, electronics, information systems, and technical services to government and commercial customers worldwide.

Northrop Grumman Aerospace Systems, Battle Management and Engagement Systems is a world leader of airborne mine countermeasures and mission package integration capabilities. Strike and Surveillance Systems Division provides world class aviation systems, both manned and unmanned.

The Airborne Laser Mine Detection System (ALMDS), and Airborne Counter-Explosive, Reconnaissance and Targeting System (ACERTS), can detect mines and other objects in the littorals, surf zone to beach exit zone, and on land.

Modular Mission Packages (MPs) bring transformational focused capability to Navy ships allowing increased flexibility by changing MPs to meet changing operational requirements and evolving threats. This concept is being implemented on the U.S. Navy Littoral Combat Ship (LCS). Northrop Grumman, as the Mission Package Integrator (MPI), provides the USN with high-performance, modular, seamlessly integrated MPs for the LCS. The result is a multi-role warship, facilitated through rearrangement of modular components sharing common design standards and network interfaces.

The MQ-8B Fire Scout, Vertical Take-off and Landing Tactical Unmanned Aerial Vehicle provides real-time/non-real-time Intelligence, Surveillance and Reconnaissance (ISR) to tactical users avoiding reliance on manned aircraft or space-based assets. Fire Scout has been selected by the U.S. Navy as the UAV Mission Package for the Littoral Combat Ship (LCS) and can operate from any air-capable ship or confined area land bases. Today, Fire Scout is operational on board the USS HALYBURTON (FFG-40) and is supporting the U.S. Army in Kunduz, Afghanistan.

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Oceaneering is a global oilfield provider of engineered services and products, primarily to the offshore oil and gas industry, with a focus on deepwater applications. Through the use of its applied technology expertise, Oceaneering also serves the defense and aerospace industries.

The Advanced Technologies (ADTECH) group of Oceaneering specializes in manned subsea and space systems, as well as practical, cost-effective robotic systems. ADTECH provides full life cycle submarine maintenance services to the U.S. Navy, space suit design and astronaut tooling for NASA, and a variety of other engineered products and solutions.

OPNAV N85

N85 serves the nation, the Chief of Naval Operations, the Navy and the Marine Corps in the development, funding, implementation and delivery of all amphibious and expeditionary warfare requirements and programs on time and on cost.

Intellectually, we are guided in all our force development efforts by “A Cooperative Strategy For 21st Century Seapower (CS21), the Naval Operational Concept 2010, and the family of Marine Operating Concepts.” Through its five major branches: Naval Special Warfare, Mine Warfare, Amphibious Warfare, Navy Expeditionary Combat Command, and Seabasing, the Division ensures that the Expeditionary Warfare forces of the United States Navy remain the most cost effective, best equipped, best trained and most combat ready and responsive in the world. “Best” and “most combat ready and responsive in the world” will be our ultimate measures of the quality delivered to the battle force and Navy.

Expeditionary warfare is the essence of naval operations from the sea anytime and anywhere in any manner. Today, the Navy is continually transforming its naval expeditionary forces – ships, aircraft, weapons, equipment, and systems – to operate across the full spectrum of roles, missions, and tasks of the 21st century. Expeditionary warfare forces, equipped with sound doctrine and appropriate capabilities, will continue to provide our nation with forward presence, deterrence, sea control, power projection, maritime security, and humanitarian assistance and disaster relief across the full range of military operations. The Naval Expeditionary Warfare Division is the foundation for the impetus behind peacetime forward deployments, rapid response to worldwide crises, and protection to United States citizens, allies, and interests wherever and whenever they might be at risk.

POWER TEN, INC.

Power Ten, Inc. is a Service-Disabled Veteran-Owned Small Business (SDVOSB) that provides professional, technical, engineering, and information technologies services to government and industry customers. Power Ten, Inc. was founded and is managed by former Marines with extensive operational and management experience who share common proven leadership and business principles – QUALITY PEOPLE, WHO DELIVER QUALITY PRODUCTS, AT A FAIR AND REASONABLE PRICE. Our people, our partners, and our customers share a bond of trust, confidence and a commitment to actionable products.

Our current services center around the the United States Marine Corps in the areas of Command, Control Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR), Marine Air Command & Control, Test & Evaluation, tactical and operational Unmanned Systems (UxS), Waste, Water & Energy, and the Marine Aviation Training System. We are an industry leader in these areas due to the performance, reputation and expertise of our people.

REAL-TIME ANALYZERS, INC.

Real-Time Analyzers, Inc. (RTA) designs and manufactures Portable Raman Analyzers specifically for operation in demanding environments, such as petrochemical refineries, field, port and tarmac operations. These analyzers are designed for military use and systems can withstand vibration, shock, and a wide operating temperature range. RTA also integrates turn-key software interfaces that allow simple Go/No Go answers for many application needs. Little or no training is required to operate the software.

RTA's Portable Fuel Analyzer (PFA) is a product which is used to evaluate unknown fuel stocks and determine if the fuel is suitable for use in military ground vehicles and equipment. Additional capabilities include the ability to predict many fuel properties that are typically obtained from fuel testing labs for example (density, flash point, cetane index, viscosity, distillation fraction, lubricity, sulfur content, etc.). The PFA also has the ability to identify many adulterants due to sabotage.

ROLLS-ROYCE

Rolls-Royce is the world's largest supplier of marine equipment and a leader in power and propulsion for naval ships. Rolls-Royce has provided equipment for every current class of surface ships and is now a key supplier to the Virginia class submarine. Products include controllable pitch propellers, fixed pitch propellers, gas turbine engines, waterjets and diesel engines.

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Weatherhaven is a leading provider of portable shelters, camps and systems for remote sites around the world. We are an accredited company that designs, develops, manufactures and installs transportable shelter systems for a wide variety of military, medical and commercial applications.

On all seven continents, Weatherhaven shelters' rugged construction has been put to the test withstanding the searing heat and blowing sands of arid deserts, the sub-zero temperatures of the frozen tundra and the torrential rains and constant humidity of the tropics.

Weatherhaven shelters, along with appropriate supplied systems, are used as kitchen/diners, field headquarters/command posts, medical facilities/field hospitals, sleepers, scientific laboratories, workshops, ablutions, and avionics equipment testing and maintenance facilities.

Through its extensive experience on projects with complex logistical demands, technical ingenuity and climate extremes, Weatherhaven has established itself as a world leader in the design, manufacturing, mobilization and installation of deployable infrastructures anywhere, anytime. At the end of a mission, Weatherhaven will demobilize, refurbish and store shelters and equipment so that they are ready for the next deployment.

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Facts at a glance:

- 18,000 employees at three sites across the Gulf Coast plus subsidiaries in San Diego, CA and Virginia Beach, VA
- Building four classes of ships simultaneously—eight ships now in production
- DDG 113 will be the 29th Arleigh Burke-class destroyer built by Ingalls Shipbuilding
- Builder of record for LPD and LHA classes of amphibious assault ships
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Marine Corps Warfighting Lab

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Strategic Insight, Ltd.

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Inside the Navy

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Naval Meteorology and Oceanography Command

Mr. Randy Whitehead
LCAC H&M ISEA Systmes Engineer

Mr. Aaron Whitley
BAE Systems Ordnance Systems

Mr. Kenneth Williams
L-3 Communications Corporation

RDML Richard Williams, III, USN (Ret)
Naval Postgraduate School

Mr. Francis Williamson
Johns Hopkins University, Applied Physics Lab

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USMC Warfighting Laboratory

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CAPT Walt Wright, USN (Ret)
Advanced Acoustic Concepts

Mr. Mike Wysong
Austal USA

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NSWC PCD

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U.S. Navy Funding Goals for Future Mine Warfare Capability

LCDR Brian Amador, USN

Date: 24 October 2011

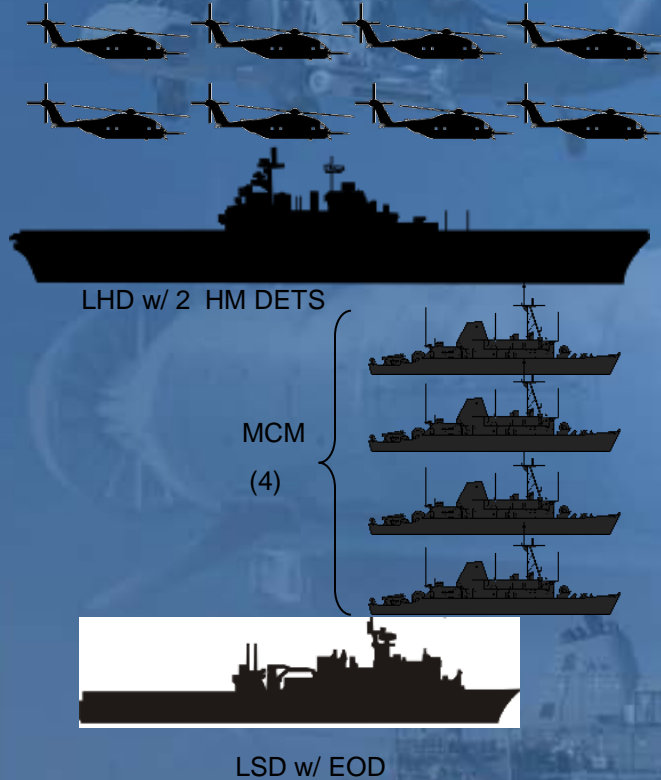


Bottom Line Up Front

- Navy committed to future MCM capability transition
- MIW resources are a small piece of the shrinking budgetary pie
- We can help with near-term initiatives – but can't do everything
- We need to prioritize getting the right capability to the fleet soonest

Mine Countermeasures Roadmap

Legacy Fleet MCM
Capability – Now Until 2020



LCS w/
MCM Mission Package
(Spiral Alpha) – 2020 and Beyond



Field a Common Set of Unmanned, Modular MCM Mission Package Systems Employable from LCS that can Quickly Counter the Spectrum of Mines to Enable Assured Access with Minimum Risk from Mines

Manpower ~ 2,300 Sailors

Modeled ACRS is comparable

Manpower ~ 390 Sailors

Right Mix of Man and Technology For Effective Operations

MCM + Mining = Mine Warfare

- The Mine Warfare Branch is responsible for both Mine Countermeasures(MCM) and Mining.
- Responsible for maintaining the current maritime mines in the Navy's inventory.



- Actively exploring future offensive mining concepts to use mines in offensive, protective, and defensive roles.



Transition Challenge: Competing Requirements

SEARCH

MH-53E, MCMs, AQS-24A, SQQ-32
(HFWB)



MH-60S, LCS, ALMDS, AQS-20A,
COBRA, UUV w/ LFBB, RMS, Mk18 UUV



NEUTRALIZE

MH-53E, MCMs, EMNS, EOD,
Marine Mammals



MH-60S, JABS, CMS, LCS,
AMNS



SWEEP

MH-53E, MCMs, Mk-105, Mk-
104, IAAG, AAG



MH-60S, LCS, USV, UISS, OASIS



vs.

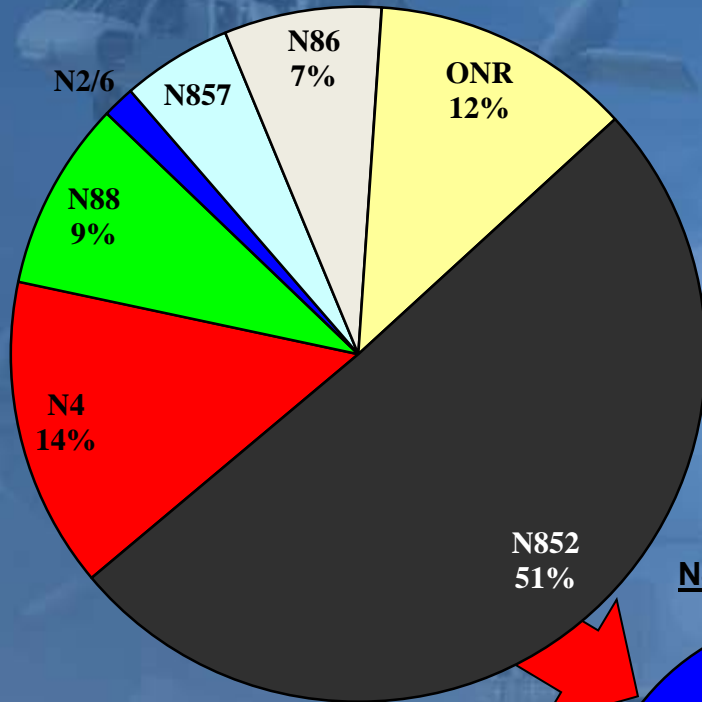
Current Resource Environment

- PB12 is currently on “The Hill”
- Navy PB12 TOA is \$161.4B – increase of \$0.8B from FY11
 - N85 slice of the pie is \$6.2B – 4% of overall budget
 - N852 budget is approx \$400M of N85’s budget
- Overall Mine Warfare budget is \$930M
 - Includes current readiness accounts
 - 0.6% of Navy TOA – LCS SCN account excluded
 - BMD budget is approximately five times larger*
 - ASW budget is approximately four times larger*
- Anticipate Continuing Resolution at start of FY12
 - Potential impact to FY12 development and testing schedule
 - CR until 18NOV and No New Starts
- Still have the “Super Committee’s” decision to deal with

PB-12 Fiscal Overview

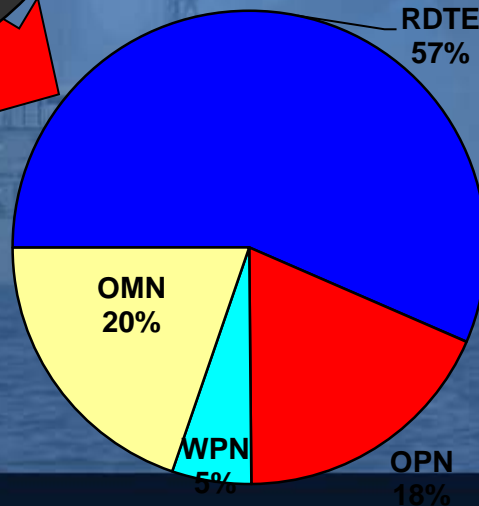
(Represents Funding Reported in FY12 MCM Certification Plan)

MIW Funding Ownership Breakout



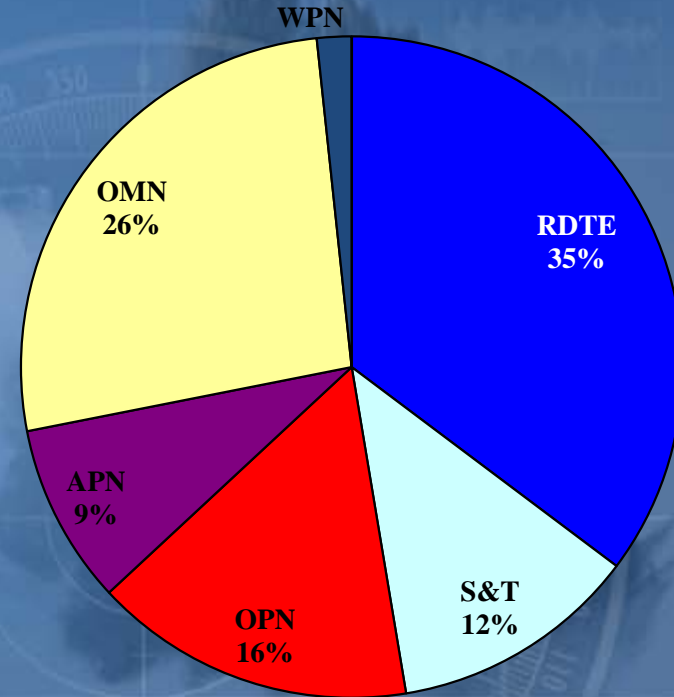
RS	\$M
N4	104.4
N852	366.1
N857	37.0
N86	52.8
N88	63.6
ONR	87.6
N2/6	10.8
Total	722.3

N852 APPN Breakout



- N4 – Readiness
- N88 – Air Warfare
- N857 – EOD
- N86 – Surface Warfare
- ONR – S&T Funds
- N852 – Mine Warfare
- N2/6 – Info Dominance

MIW Funding APPN Breakout



APPN	\$M
RDTEN	254.6
OPN	113.5
WPN	12.2
OMN	190.8
S&T	87.6
APN	63.6
Total	722.3

Near Future MCM Challenges

- Sensor and Processing False Alarms
 - High False Alarms mean longer PMA & higher False Classification by PMA Operator
- Single Pass Detect to Engage
 - High False Alarms requires multiple passes to identify
- Computer Aided Detection(CAD)/Classification(CAC) Improvements
 - Potential for real-time algorithms in the MCM Community
 - Fast and accurate CAD/CAC capability needed for all PMA
- Reliability
 - System Reliability needs to meet requirements
 - Meet Operational Availability (Ao)
 - Improve Mean Time Between Operational Mission Failure (MTBOMF)
 - Require modular, open architecture systems that are supportable long term
- Mining
 - Stand-off delivery of mines
 - Remote Command and Control of mines
 - Distributed network of sensors in support of command and control



Summary

- The mine threat is real and not getting easier.
- The transition to LCS-based MCM is challenging...*and innovative.*
- Decreasing TOA makes TOTAL OWNERSHIP COST a key driver
- But.....system suitability and effectiveness still most important

Got a solution?

Contact CAPT Brakke at Brian.Brakke@navy.mil



Questions

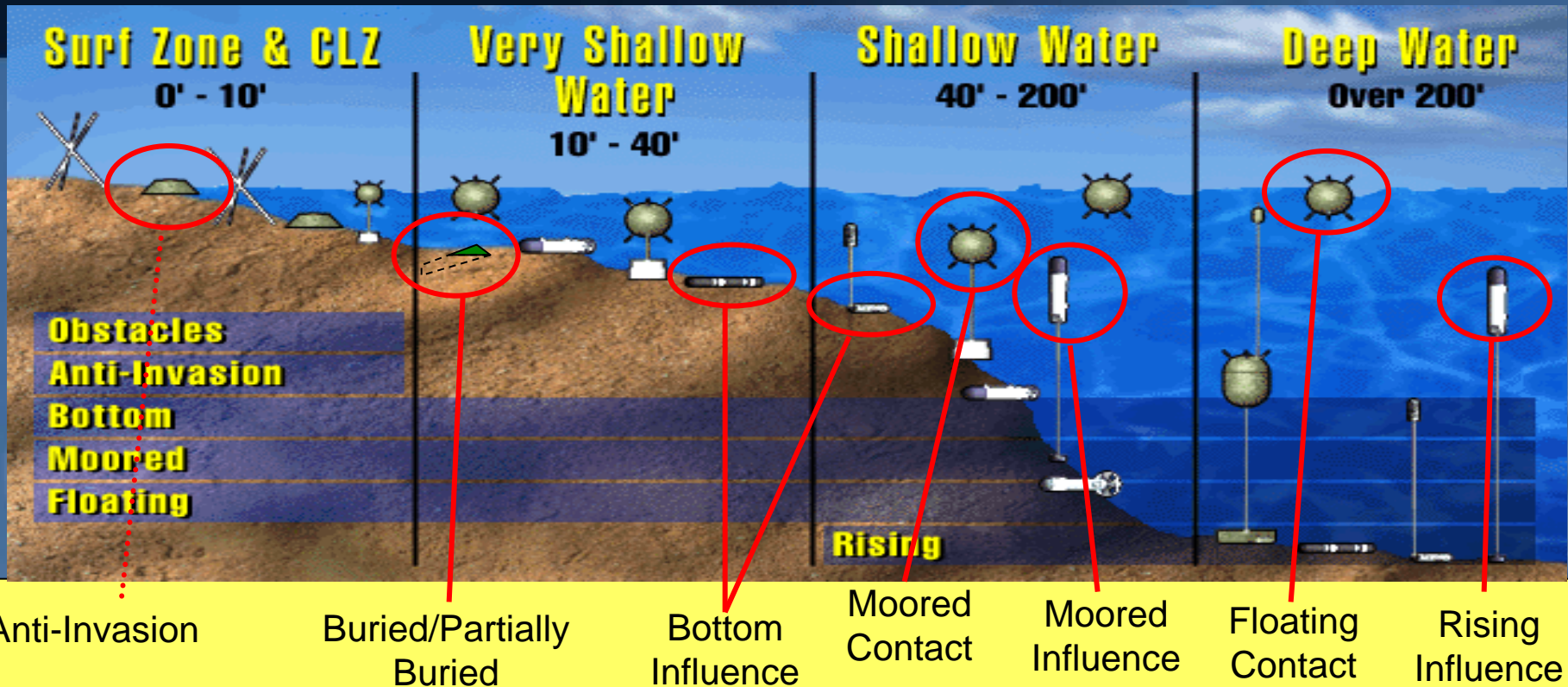
The Big Question: How good is good enough?

CNO says: “90% is good enough, let’s get out of R&D and into the fleet!”

- How much better is the reduced performance future systems over present fielded systems?
 - Likely Performance of Future vs. Present Performance of Legacy
- Analyzing the present performance MCM MP systems to determine if they support Overarching LCS MCM MP KPPs.
 - Many Future MCM system requirements (ORDs) written well before LCS Concept—are they aligned?
 - Huge Effort, reliant on modeling (NMWS)
 - IF we are falling short in KPPs, namely Area Coverage Rate Sustained (ACRS), WHERE do we make improvements? (ROI)

N85 assessing traceability of system requirements to MCM MP requirements

The Threat to Assured Access

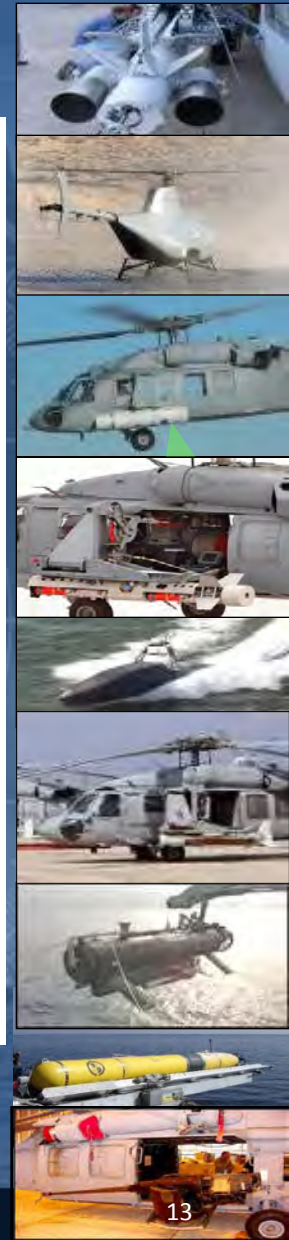


- The real goal of a minefield is Sea Denial, NOT the damage or destruction of a specific ship.
- The Sea is a maneuver area. Navy goal is to assure Access, support STOM/OMFTS, NOT counter every mine.

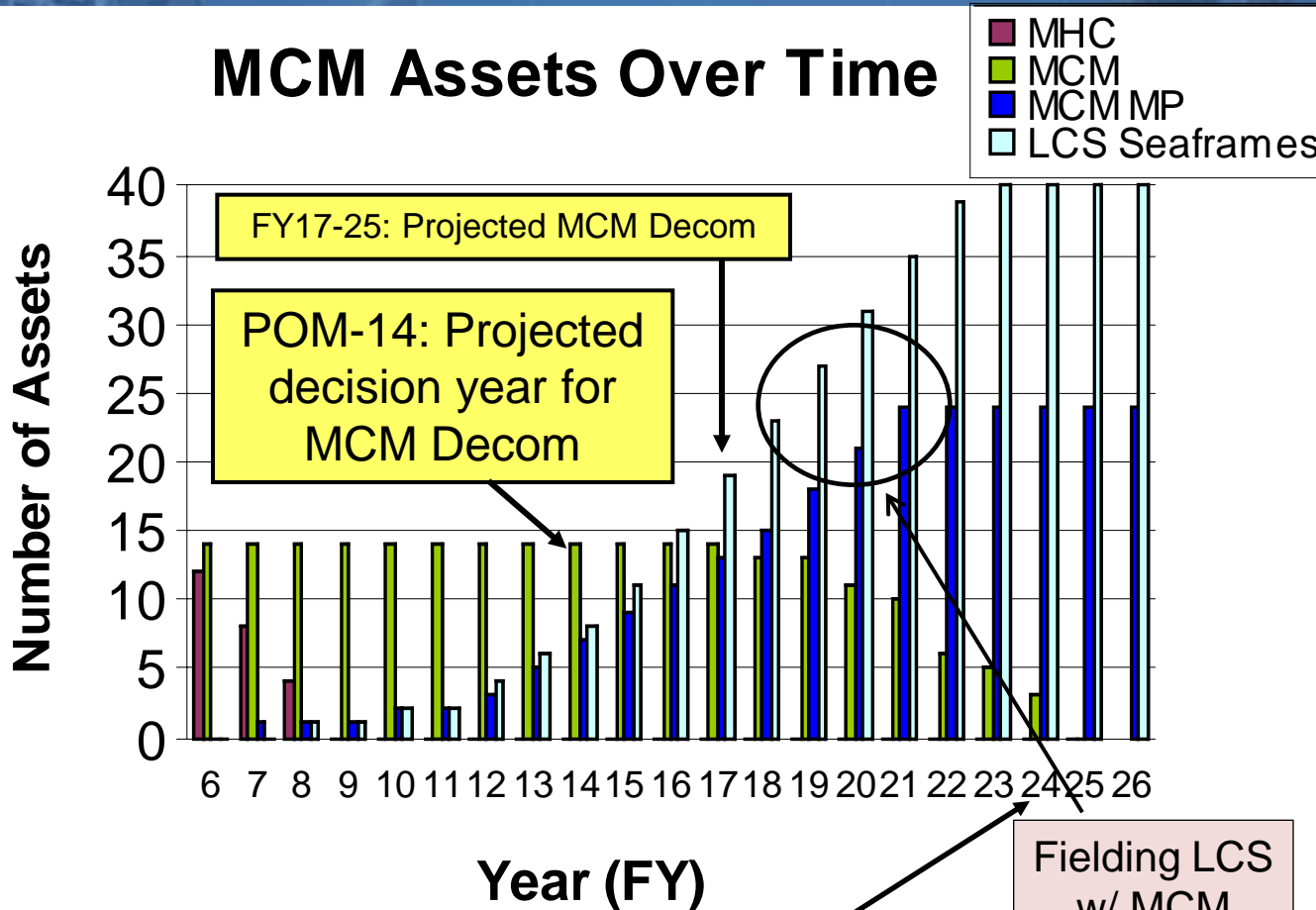
- Over 300 Mine Types
- Over 50 Countries Possess
- Low Cost but High effects
- Simple to Deploy
- Asymmetric



Transition to LCS-based MCM



MCM Assets Over Time



FY24-25: Projected MH-53E Sundown

MCM Coverage in 2018

Minefield Detection and Neutralization



Assault Breaching System



EOD Mobile Unit ONE

Laser (Hunt)



Airborne Laser Mine Detection System

Airborne Mine Neutralization System



Propelled explosive charges (Kill)

Surf Zone & CLZ
0' - 10'

Very Shallow Water
10' - 40'

Shallow Water
40' - 200'

Deep Water
Over 200'

Obstacles
Anti-Invasion
Bottom
Moored
Floating

Rising

Surface MCM UUV and Low Frequency Broadband



Buried Mine Detection

Remote Minehunting System & MH-60S AN/AQS20A



Sonar (Hunt)

Airborne Mine Neutralization System



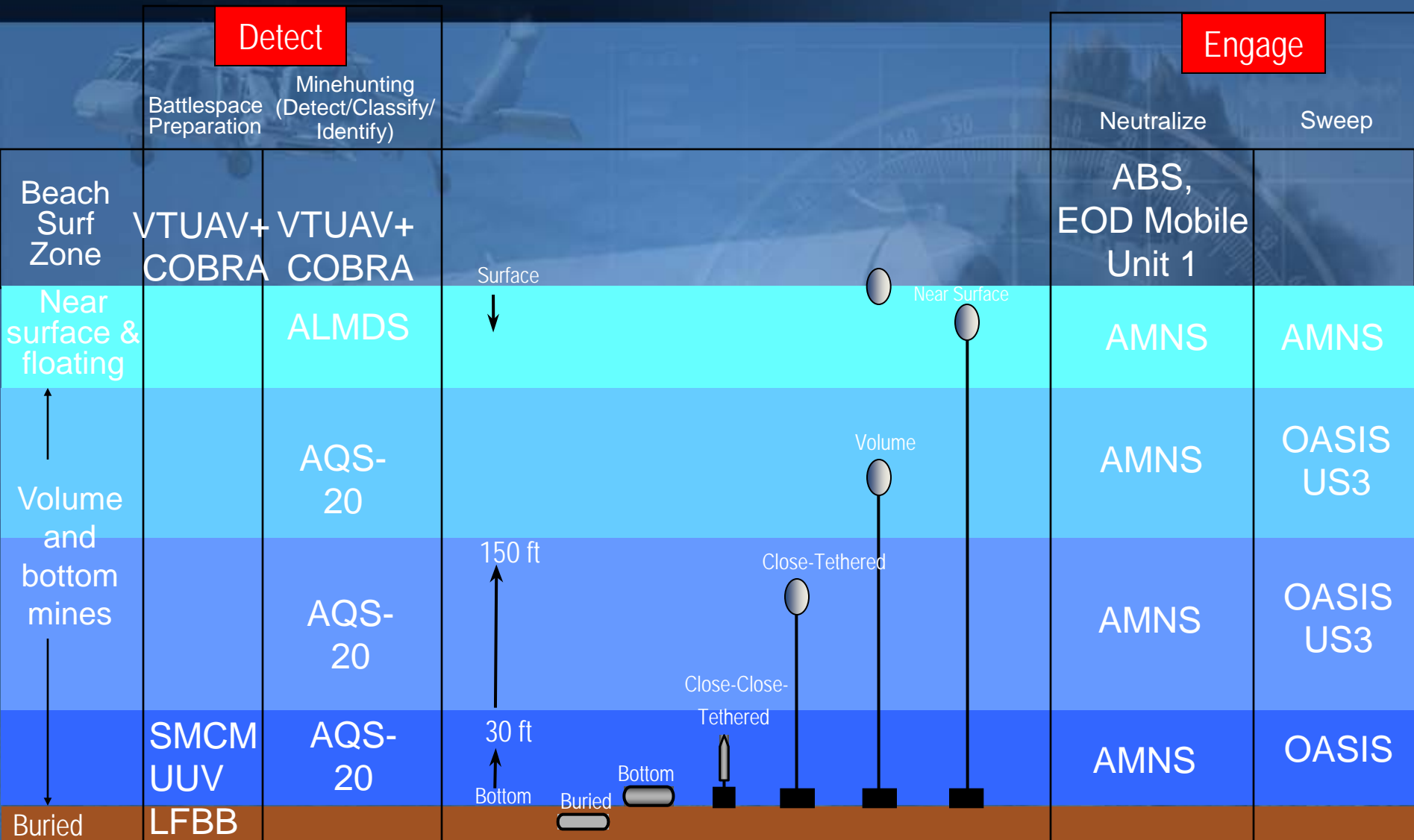
Propelled explosive charges (Kill)

Unmanned Surface Vehicle / Organic Airborne and Surface Influence Sweep



Magnetic Acoustic Influence Sweep

LCS MCM Mission Package System Coverage



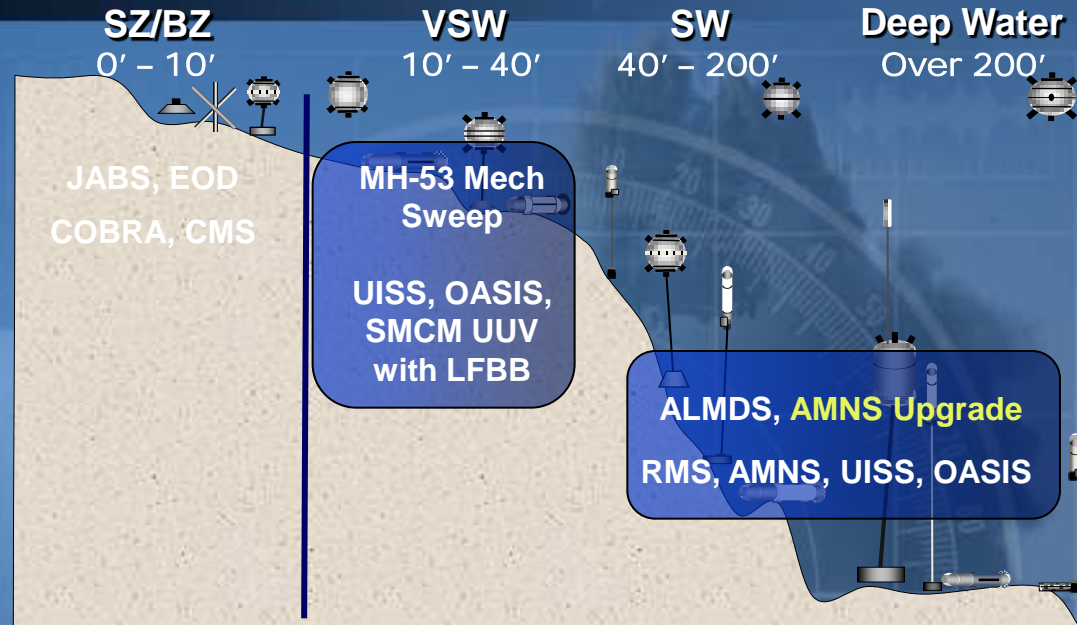
* NOTE : Depth Coverages Vary with System and Mine Type

MCM System Investments

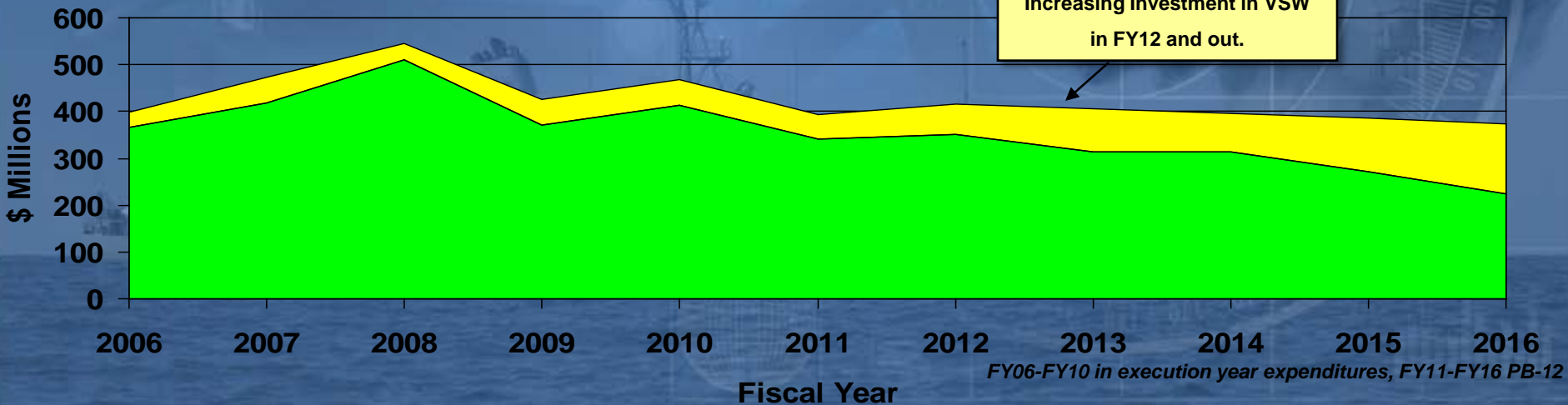
- **Greatest investment in the SW/DW**
 - 33% of FY11 budget allocated to legacy systems
 - Decreases to ~20% by FY16 as LCS-based systems fielded
- **Increased funding to the VSW zone**
 - JABS Upgrade
 - UUV with LFBB
 - Potential COTS solutions

• **Investments in SW/DW Sustain Legacy Force and Deliver the Future**

• **Initiatives to Solve the VSW Problem Are Underway**



Increasing Investment in VSW in FY12 and out.



MIW Near/Mid-Term Vision

- **LCS-based MCM vision is correct for the near & mid-term years** – *requires completion of testing and operational validation*
- **Legacy (dedicated) SMCM/AMCM forces healthy to 2020** – *planning on extended life service program (ELSP), if needed*
- **Major risks** – *integrating new systems to LCS and MH-60S, completing operational testing, and fielding revolutionary technology*
 - **Coordinate**: Balance LCS early capacity to bridge legacy systems divestiture.
 - **Control**: The cost of systems within the LCS MCM Mission Package are increasing due to technical challenges and pacing of the LCS and MCM MP's--extending development time and adjustments in procurement profile.
 - **Performance**: Majority of systems are approaching test phase... focused on KPPs for effectiveness and suitability requirements

Prioritize getting the right capability to the fleet soonest

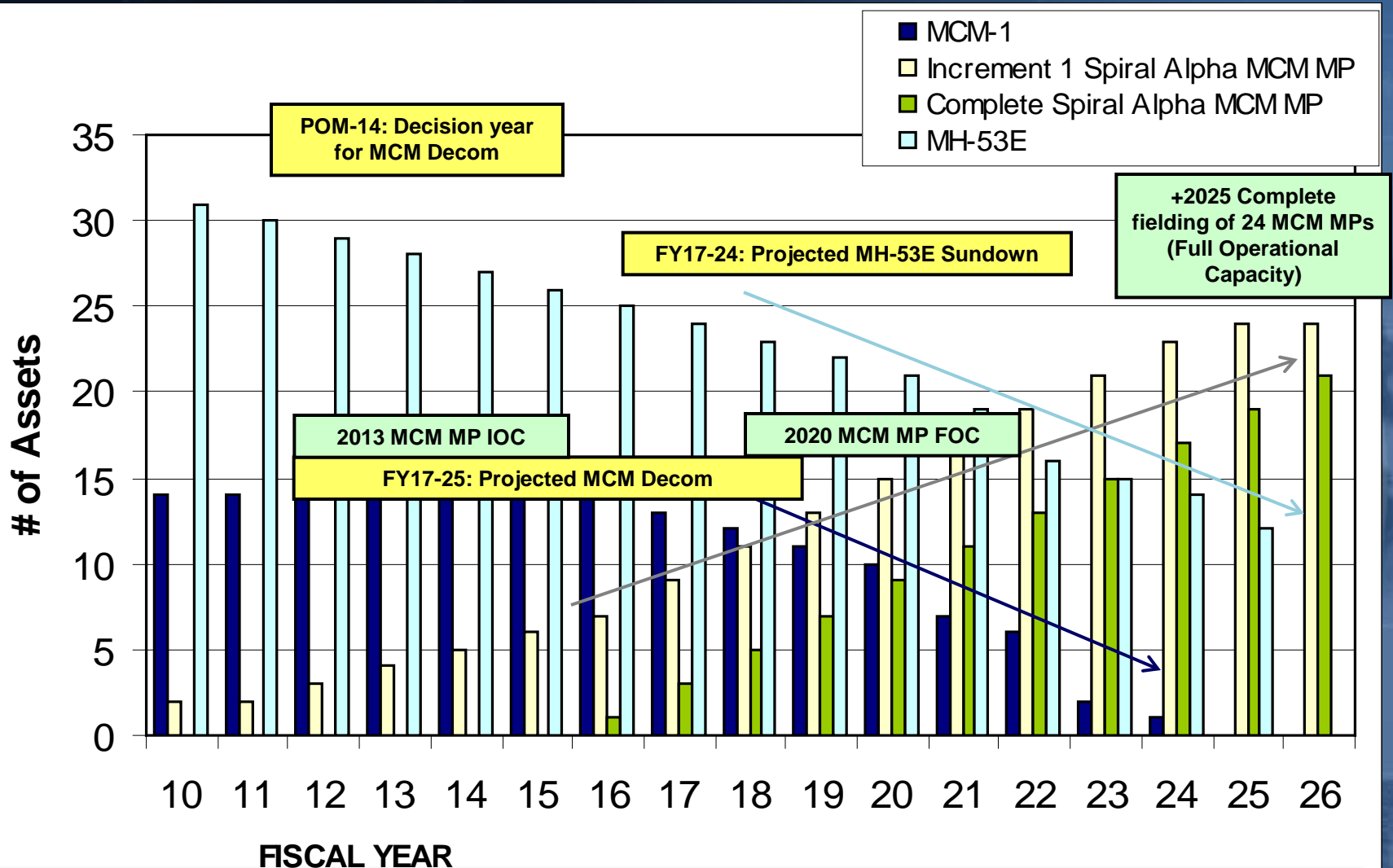


MIW Far-Term Vision

- **Stop doing things “the old way”**
 - Increased passive MCM through ISR, satellites, and IPOE
- **Utilize Unmanned Undersea Vehicles (UUVs) and Unmanned Surface Vehicles (USVs)**
 - Comms, endurance, and power generation/management issues inherent with UUVs/USVs must be resolved
 - Flexible, adaptable, open architecture design. Stovepipes removed.
 - Idea: A common powered-section that can be fitted with a mission-specific “front end” (e.g., minehunting, neutralization, or even minelaying)
 - Idea: Air-dropped UUVs for rapid reaction. Need robust design while adhering to weight & aircraft/helo integration
- **Multiple, networked UUVs/USVs operating autonomously in suspected mine danger area**
 - Full Detect-to-Engage capability in a single pass

Far-Term => Autonomous, Networked UUVs and Advanced Underwater Weapons

Transition from Legacy to Future



MCM program maintains current capacity without MCM-1 ELSP and supports LCS-based MCM to relieve forward deployed forces by 2020.

Major PB-12 Adjustments

Program ADDS

RMS Add to OSD CAPE Estimate	\$ 101.7
EOD UUV (MK 18 UUV)	\$ 76.0
AMCM SDLM Add	\$ 38.4
ALMDS Add (Field Inc.1, Dev Inc II)	\$ 31.7
AMNS Add (RDTEN & OPN)	\$ 31.2

Program TAKES

MCM MP Reduction	-\$ 166.1
AMNS WPN Reduction (EMNS)	-\$ 110.1
RAMICS Vertical Kill	-\$ 82.1
CMS WPN Reduction	-\$ 54.9
EMNS Vertical Kill	-\$ 49.8
SMCM UUV Reduction	-\$ 32.9

- Aligns resources (LCS ships and MP system)
- Slowed procurement and quantities of CN's
- SMCM was bill payer for other MCM programs

Maritime Mining

Mr. Scott Burleson
NSWC – Panama City Division

Distribution Statement A: Approved for Public Release; Distribution is Unlimited

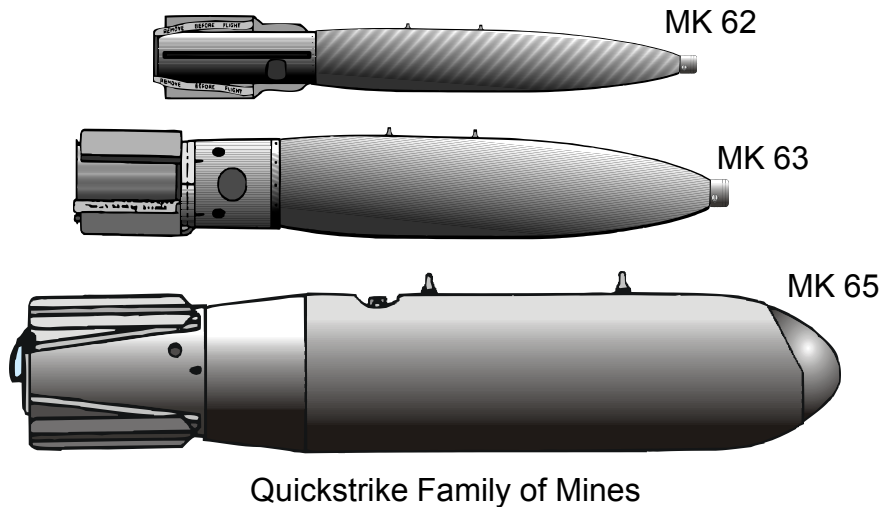
Mine Delivery Platforms



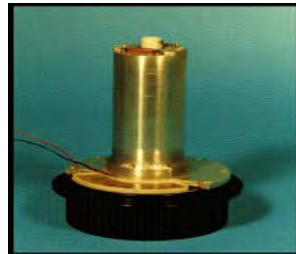
- USN
 - ✓ P-3C
 - ✓ F/A-18
 - ✓ P-8 (future)
 - ✓ SSN 688 Class
- USAF
 - ✓ B-1B
 - ✓ B-2
 - ✓ B-52H

Leaders in Littoral Warfare and Coastal Defense

Quick-Strike Family



Quickstrike Family of Mines



Target Detecting Device
MK 71 MOD 0

Characteristics & Status

- Magnetic, Seismic, Pressure Sensors
- MOD 3 (TDD MK 71)
 - Programmable
 - Modular
 - Pressure Sensor for all QS Mines

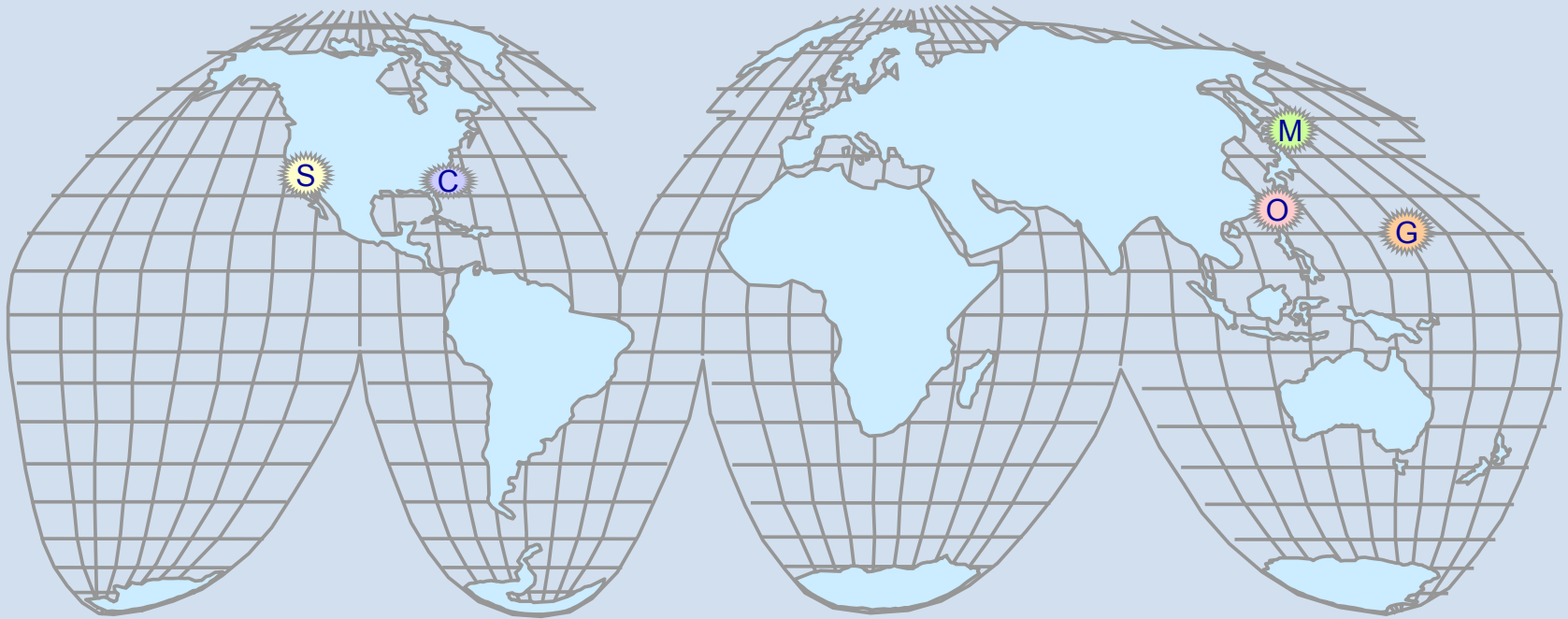
Future

- Command and Control
- Target Processing Algorithms
 - Fast, Low-Signature Surface Targets
 - Slow, Low-Signature Subsurface Targets
- Delivery
 - Stand-off Air Delivery
 - Clandestine



Mine Assembly Units

Global Support



NMC UNIT

Seal Beach, CA



NMC UNIT

Charleston, SC



NMC UNIT

Okinawa, JA



NMC UNIT

Misawa, JA



NMC UNIT

Guam

Leaders in Littoral Warfare and Coastal Defense

Value of Sea Mining

- Low-cost Battle-Space Shaping and Force Protection
 - Keep the enemy where you want him
 - Force the enemy into areas he doesn't want to go
 - Keep the enemy out of areas he would like to go
 - Disrupt an enemy's battle plan
 - Attrite enemy forces
- Diplomatic and Military Leverage

Operational Limitations

- Delivery Options – Capability, Capacity, Risk
- Target Discrimination - Enemy, Friendly and Neutral Targets
- Friendly Force Area Maneuver Impact
- Command and Control (C²)
- Dynamic/Flexible Re-tasking or Recoverability
- Immobile weapon - Stationary minefields can be circumnavigated

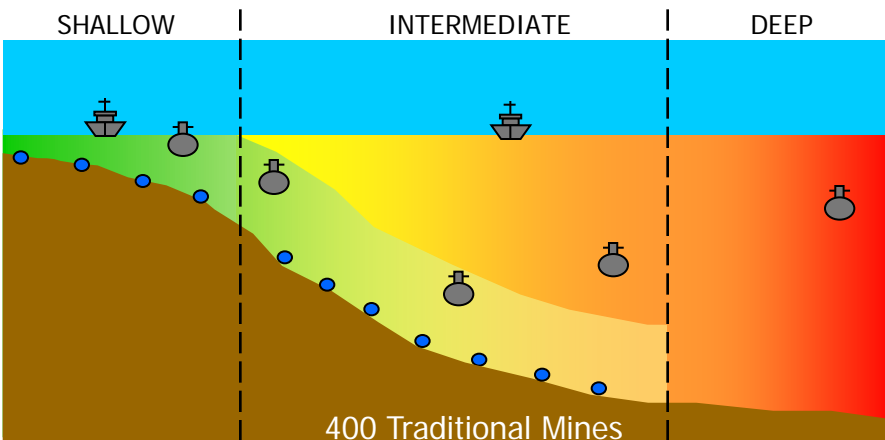
Traditional Mining (strategic, autonomous, overt)



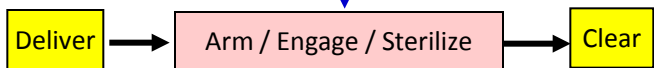
Quickstrike



SLMM (through FY12)



Autonomous



Hours Months Months

Risky Delivery & Extensive Clean-up

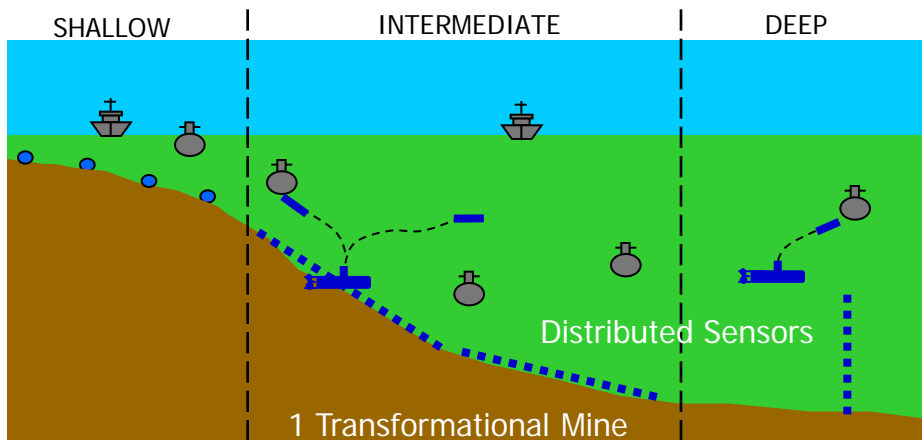
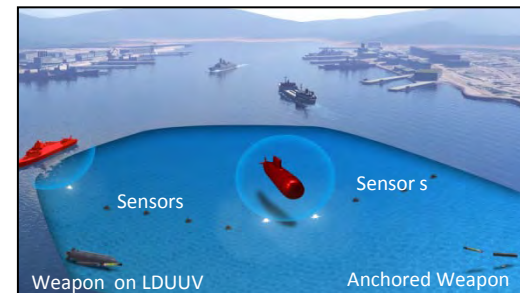
Transformational AUWS (tactical, controlled, clandestine)



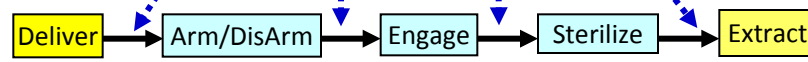
LDUUV w/Sensors & Weapons

Three Products:

- Tactical Positioning & Fire Control
- Remote Command & Control
- Auto Threat Detection & Localization



Remote Control w/ Supervised Autonomy

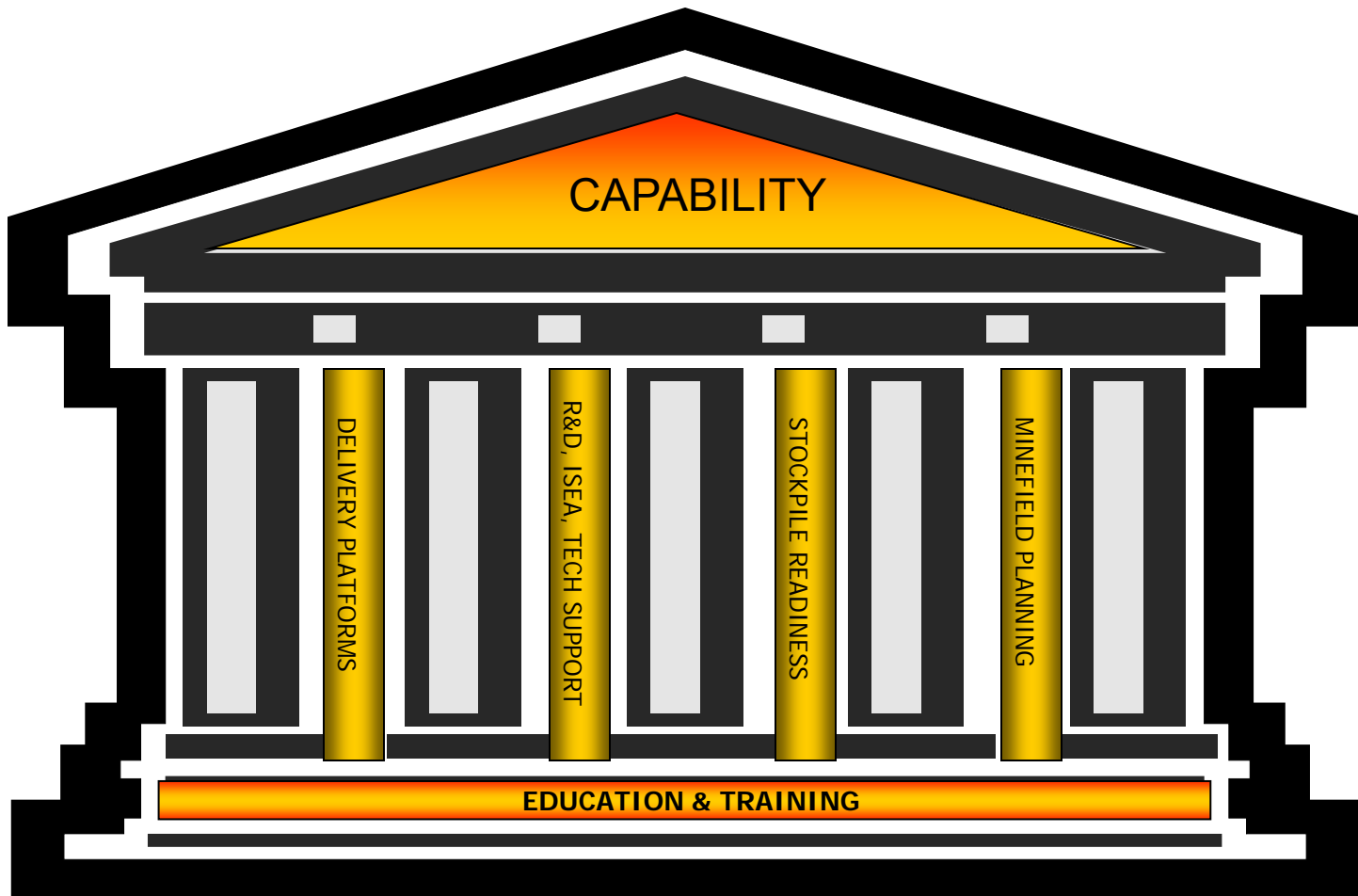


Hours Minutes Minutes Minutes Hours

**Eases Delivery & Clean-up;
Provides Tactical Flexibility**

Maritime Mining

'The Parts Make The WHOLE'





Questions

Expeditionary Warfare OPNAV N85

16th Annual Expeditionary Warfare Conference

The background image shows the deck of an aircraft carrier. Several F-35 fighter jets are lined up on the deck, and a CH-53E Super Stallion helicopter is in flight in the foreground. The carrier's superstructure is visible in the background. A semi-transparent blue grid and circular radar-like patterns are overlaid on the left side of the image.

**“Integrating Future
and
Present Capabilities”**

26 Oct 11

MajGen Timothy “BT” Hanifen, N85

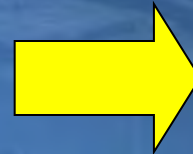
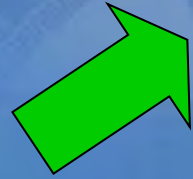
The Priority of Mine Warfare

1. Balanced POM 13 Sponsor Proposal Development With Corresponding Unfunded or Non-Performing Program Vertical Off-sets
2. Successful Development, Operational Test & IOC Fielding of LCS Mine Mission Package in FY11/12/13/15 & 17 (N852 Lead)
3. Oversight and Implementation of JSF Integration, Testing and Fielding on USS Wasp and within the Amphibious Fleet (N853 Lead)
4. Delivery of LHA R Flight 1 Design Option Analysis and DoN Leadership Decision by 2QFY11 (N853 Lead)
5. Delivery of Fundamental Enhanced MPSRON Operational Capabilities by 4QFY13 (Seabasing Lead).
6. Methodical Process To Iteratively Re-Examine The Capabilities, Capacity and Force Structure Requirements of Post-OEF NECC on a yearly basis (N857 Lead)
7. Integrated Oversight Tracking and Improvement in Amphibious Fleet Readiness and TOC across all warship classes and equipment (N853)

I think about MIW a lot---just ask Ocho Rios!

State Of Mine Warfare

- Mining
- Mine Detection
- Mine Sweeping
- Mine Neutralization



Legacy "Man in the Minefield"

Legacy "Man in the Minefield"

*Closing the Tech Gap in Shallow to Deep Water First...
Then Solving the VSW Through Beach Exit Zone*

Recent Successes

- Raytheon's AQS-20A mine detecting sonar completed OA and will enter OT in early FY13. Expect to deliver the system to the Fleet in late FY13.
- Northrop Grumman's Airborne Laser Mine Detection System (ALMDS), currently in Developmental Testing, is also planned to bring a leading-edge LIDAR detection capability to the Fleet in FY13 upon completion of OT in early FY13.
- Lockheed Martin's Remote Minehunting System has entered the initial stages of a thorough Reliability Growth Program, which has the program back on track and will revolutionize the way we conduct MCM, with unmanned vehicles.
- ITT continues to develop and build the Navy's influence minesweeping capability: legacy but proven Mk-105 Mod 4 sleds, Organic Airborne and Surface Influence Sweep (OASIS), and the Unmanned Influence Surface Sweep (UISS).

The Challenge...and Solution

- Cannot wish away the mine problem.
- Potential adversaries will use sea mines against the U.S. and our allies to impede and reduce our maneuver and access.
- Advancements in mining technology are simple and inexpensive when compared to the required effort in developing effective MCM systems.
- We have invested heavily into MCM Mission Packages, which will operate from the LCS and are expected to reach both greater capacity and capability than our legacy MCM force.

We are on the verge of delivering advanced MCM technology to the Fleet.



Questions?

Mine Warfare

NMAWC Perspective

NDIA Expeditionary Warfare Conference



Mr. Randy Hill
Naval Mine and Anti-Submarine Command (NMAWC)
Oct 2011



NMAWC



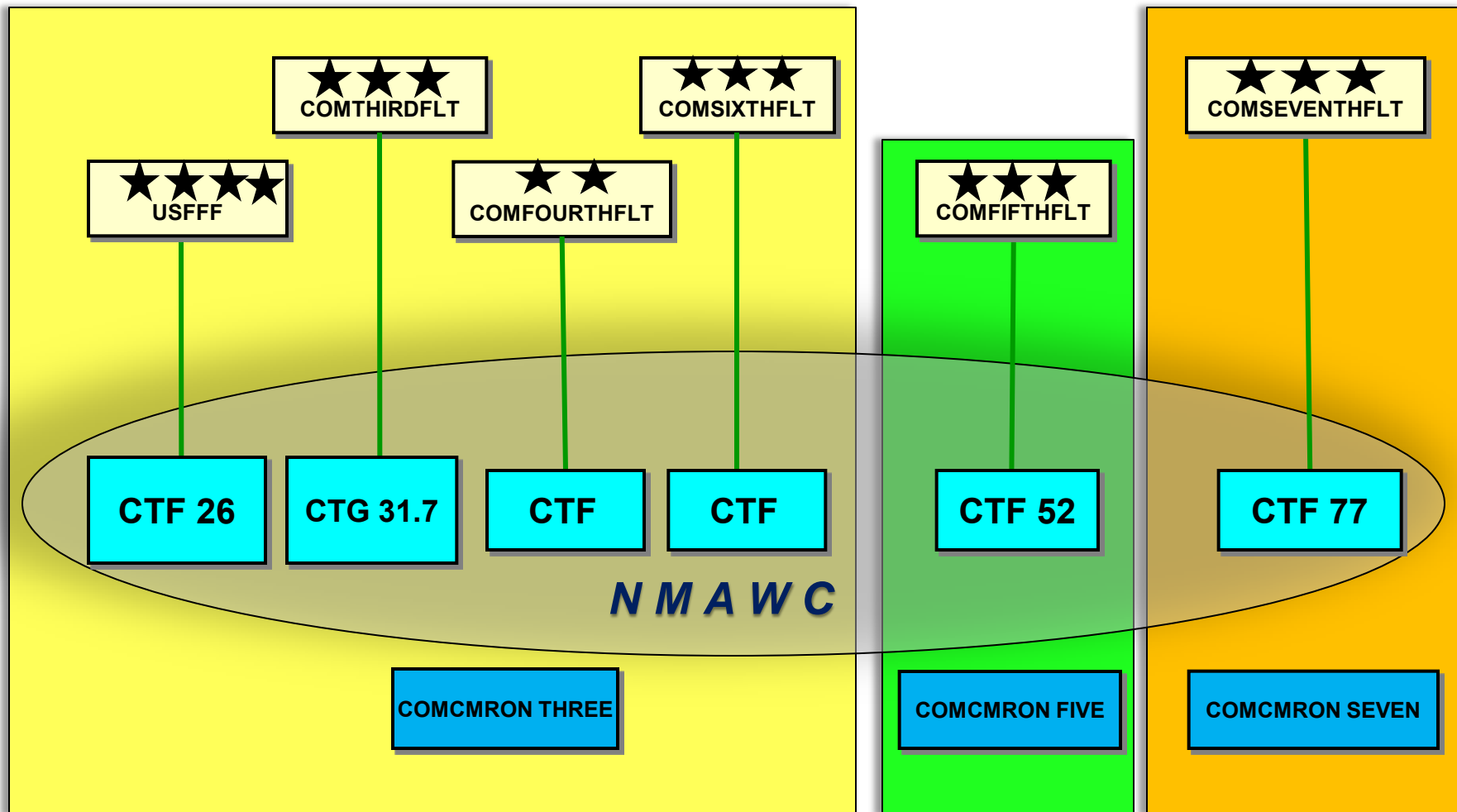
- **Capability Based Assessments**
- **Standing, Deployable Commander of Task Force**
- **Warfare Center of Excellence**



Single Fleet Focal Point for USW



MIW Operational Support



Deployable staff supports NCC MIW operations



Fleet Engagement



SHAMAL *Arabian Gulf*



Ulchi Freedom Guardian *Korea*



Frontier Sentinel *Norfolk*





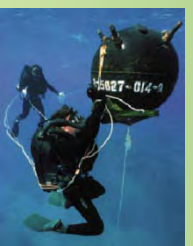
A Force in Transition



Today

Future

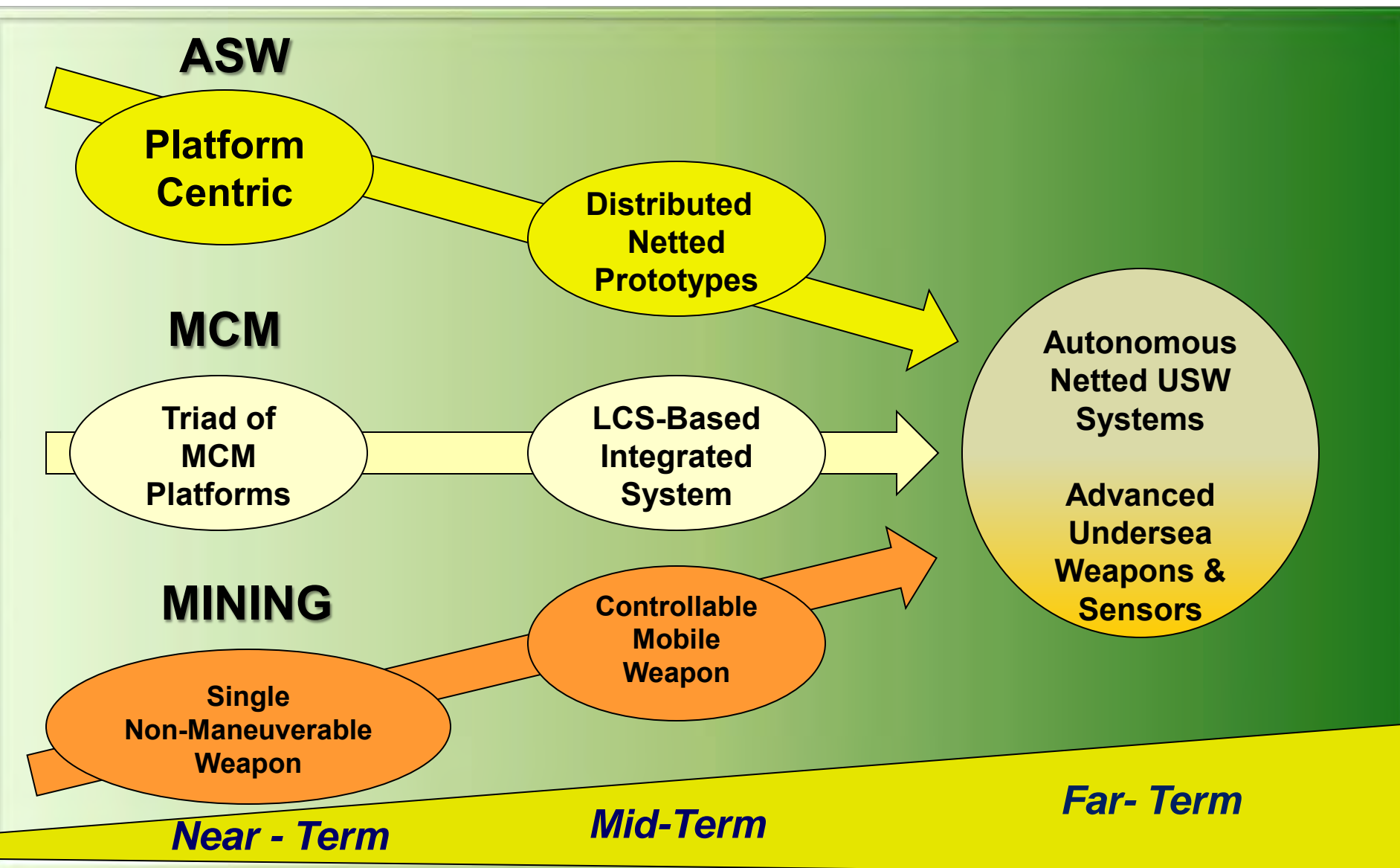
TRANSITION



Transition must be seamless



Transforming USW





Questions?



Future of MIW from the LCS Platform

24 October 2011

RDML Jim Murdoch, USN
PEO LCS

Distribution Statement A: Approved for Public Release; Distribution Unlimited. (11/16/2011). This Brief is provided for Information Only and does not constitute a commitment on behalf of the U.S. government to provide additional information and / or sale of the system.



Littoral Combat Ship



- Optimized for warfighting in the littoral
 - Unique designs for unique environment
 - Fast, maneuverable, shallow draft
- Targeted at critical capability gaps
 - Reconfigurable single mission focus
 - Mines, small fast surface craft, diesel submarines
- Modular open systems architecture
 - Onboard sensors, weapons, command & control
 - Offboard unmanned air, surface, and underwater vehicles
- Naval and Joint Force multiplier
 - Provides operational flexibility
 - Fully netted

LCS 1 variant

Lockheed Martin Prime

Shipyard: Marinette Marine, Wisconsin
Steel semi-planing monohull



LCS 2 variant

General Dynamics Prime (LCS 2 & 4)/
Austal USA Prime (LCS 6 AF)
Shipyard: Austal USA, Alabama
Aluminum Trimaran



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LCS Production



- LCS 1 (FREEDOM) and LCS 2 (INDEPENDENCE) are Delivered and undergoing Post Delivery, Test and Trials
- LCS 3 (FORT WORTH) and LCS 4 (CORONADO) will deliver next year with good cost and schedule performance
- LCS 5 (MILWAUKEE) and LCS 6 (JACKSON) are under construction
- LCS 7 (DETROIT) and LCS 8 (MONTGOMERY) are under contract
- MCM (2) and SUW (2) Mission Packages delivered and in testing
- PEO LCS will procure 4 Ships and 3 Mission Packages in FY12



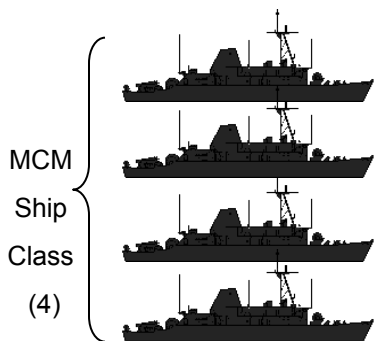
MCM Transition Legacy To LCS



Current Fleet Mine Countermeasures Capability



LHD (Large Deck Amphibious Ship)

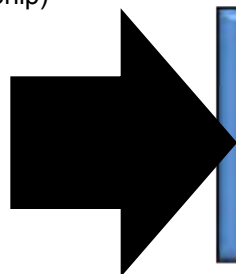


MCM
Ship
Class
(4)

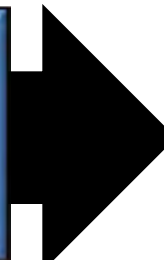


LSD (Amphibious Ship) w/ EOD & Marine Mammal Systems

Manpower ~ 2,300 Sailors
Sailors in Minefield: ~360
Area Coverage Rate



LCS
No Sailors in
the Minefield



LCS w/ MCM Mission Package



LCS – Independence Variant w/ MH-60S



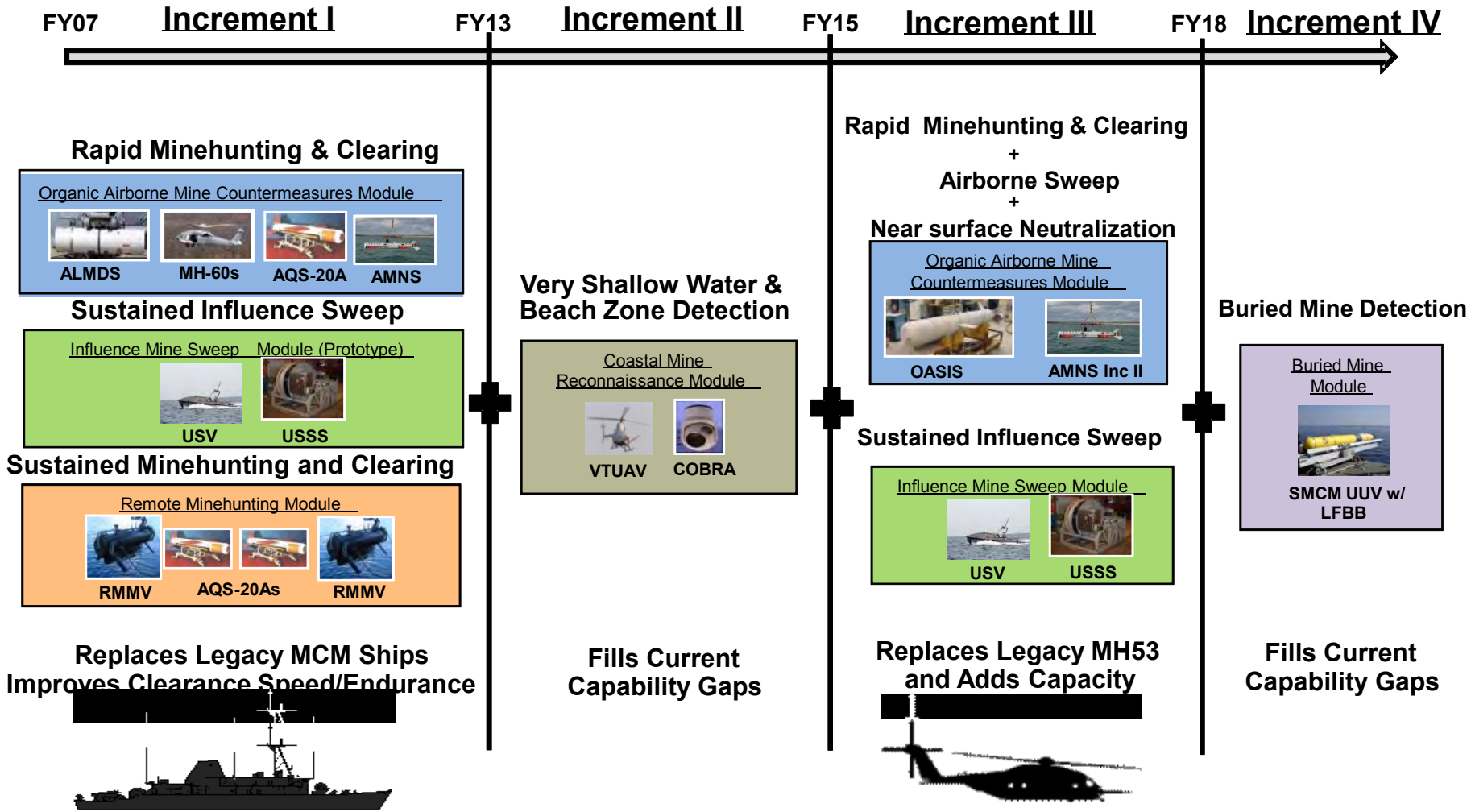
LCS – Freedom Variant w/ MH-60S



Manpower ~ 390 Sailors
Sailors in Minefield: 0
Improved Area Coverage Rate



MCM Mission Package Capabilities





MCM MP – Developmental Testing (DT) Accomplishments



- Successfully executed first simultaneous offboard systems mission
 - Remote Minehunting System (RMS) and MH-60S with AN/AQS-20A
- Executed Organic Airborne Mine Countermeasures (OAMCM) Missions
- Active Crew/Detachment Participation
- Executed RMS Launches & Recoveries
- MCM Situational awareness off-ship successfully executed from ship to Shore-based Command Center via GCCS-M
- Timed all test mission evolutions including MCM MP on-load



MCM MP Developmental Testing on LCS 2 in Progress



Focus for Future Mine Warfare in LCS



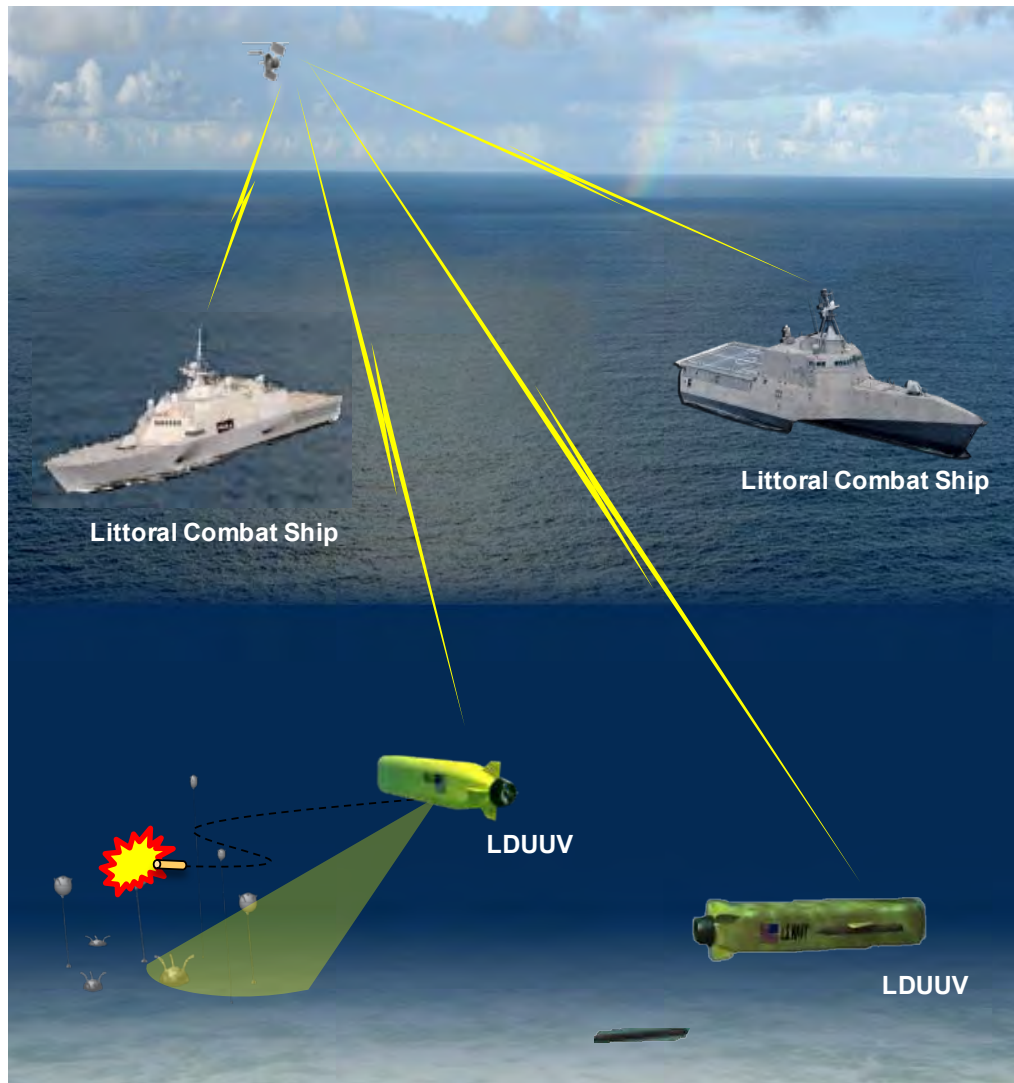
- Integrated Testing
 - Ensure Key Performance Parameters are synchronized and appropriate for systems and Mission Packages
 - Ensure that PEO LCS and partners are working together to support LCS requirements, integration and improve test and evaluation efforts
- Fleet Introduction
 - Position sailors, ship, mission modules, maintenance processes to meet the challenge
 - Embarking on a new set of capabilities, training /career path challenges and loss of current MIW expertise
- Future Technology, enabled by Open Architecture - Commonly Controlled, Multi – Faceted Unmanned Systems
 - USVs
 - LDUUV



LDUUV



- PMS406 establishes LDUUV PoR, leveraging the LDUUV Innovative Naval Prototype development from ONR
- AoA Scope and Tasking Directive development in progress
- Expect RFP in FY14
- LDUUV is able to be launched from a variety of platforms to include LCS
- LDUUV missions include IPOE, ASW, Above-water ISR, Mine Countermeasures (detect to engage), and Offensive Mining





Questions





Developing MCM MP Capabilities Soonest



Enabling the Development of *Developing MCM MP Capabilities Soonest*



This Is A Team Effort!



Lab Development & Integration Roles



- 65 years of experience in MCM
- Gulf of Mexico Ranges
- MH-60S Detachment
- Facilities



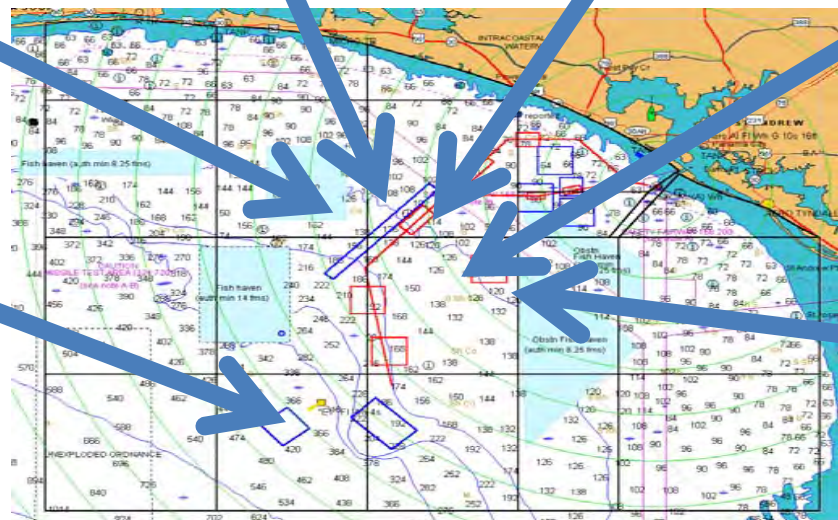
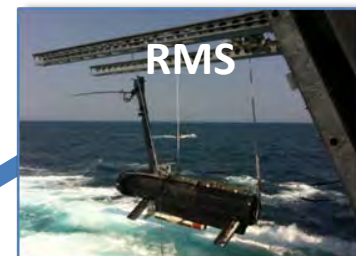
Prototyping

- Unmanned Surface Sweep
- SMCM UUV UOES
- COBRA Blk 2
- SUMMIT
- RFID Tagging
- Mission System Transporters



No Shortage of Good Ideas
Challenge is Getting them to the Fleet Quickly

Test & Evaluation



System Familiarization

- AMCM Continuum
- MCM MP Detachments
 - Classroom Instruction
 - Hands-on Experience During End-To-End and DT
- HX-21/VX-1
 - OAMCM Systems
 - OPMA



Engaging the Sailor Early in the Development Process



Summary

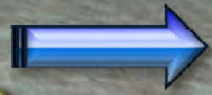
- ✓ This is a Team Effort
- ✓ Got the Sailors Involved Early
- Need to Accelerate “Development To Delivery” Timeline
- Need Enabling Technologies
 - Automation
 - Data to Knowledge
- Get It Right the First Time!
 - Very little time for mistakes
 - Testing to requirements
 - Test discipline
 - Deliver working systems to the Fleet



Mining in Transition



THE
TRANSITION



MR. SCOTT
BURLESON



U.S. Navy Funding Goals for Future Mine Warfare Capability

CAPT Mark Rios, USN

CAPT Brian Brakke, USN

LCDR Pat Gendron, USN

Pentagon Janitors

LCDR Amador, USN

Date: 24 October 2011



Facebook Profile



AMADOR Formula

SALE
BATCH: 001848
INV: 422365

AUTH: 020552

BASE \$26.86

TIP \$ π

TOTAL \$ 30.00



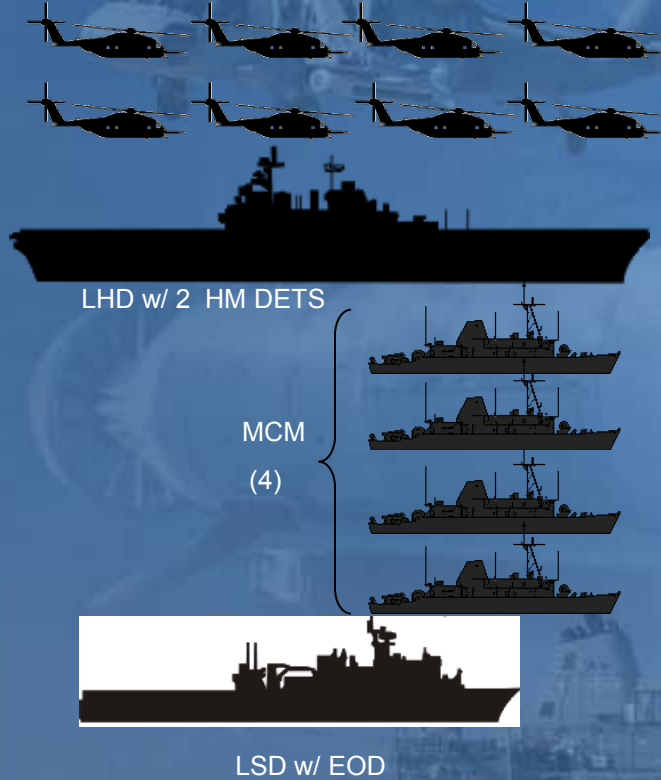
Bottom Line Up Front

- Navy committed to future MCM capability transition
- MIW resources are a small piece of the shrinking budgetary pie
- We can help with near-term initiatives – but can't do everything
- We need to prioritize getting the right capability to the fleet soonest



Mine Countermeasures Roadmap

Legacy Fleet MCM Capability – Now Until 2020



LCS w/ MCM Mission Package (Spiral Alpha) – 2020 and Beyond



Field a Common Set of Unmanned, Modular MCM Mission Package Systems Employable from LCS that can Quickly Counter the Spectrum of Mines to Enable Assured Access with Minimum Risk from Mines

Manpower ~ 2,300 Sailors

Manpower ~ 390 Sailors

Modeled ACRS is comparable

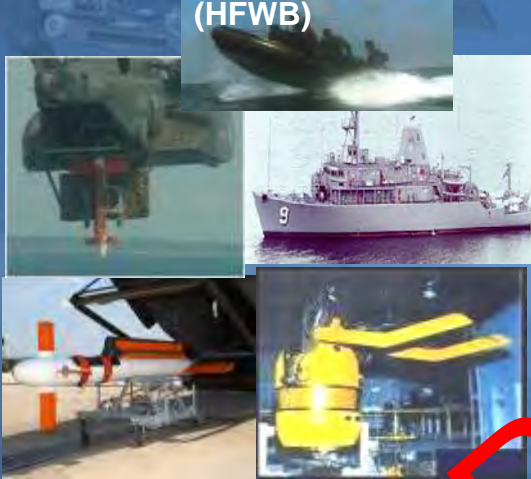
Right Mix of Man and Technology For Effective Operations



Transition Challenge: Competing Requirements

SEARCH

MH-53E, MCMs, AQS-24A, SQQ-32
(HFWB)



NEUTRALIZE

MH-53E, MCMs, EMNS, EOD,
Marine Mammals



SWEEP

MH-53E, MCMs, Mk-105, Mk-104, IAAG, AAG



vs.



MH-60S, LCS, ALMDS, AQS-204,
COBRA, UUV w/ LFBB, RMS, Mk 18 UIUV



MH-60S, JABS, CMS, LCS,
AMNS



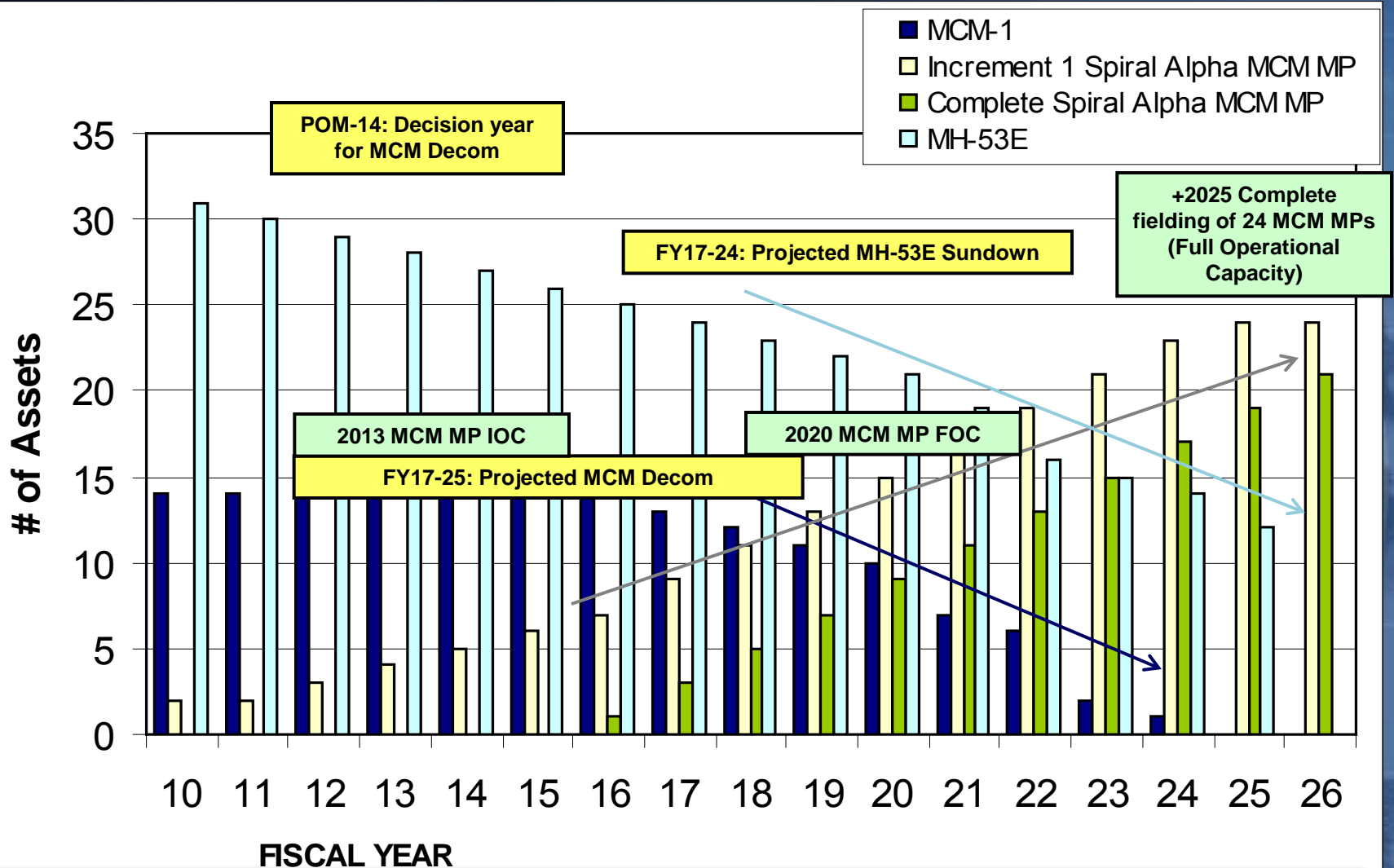
MH-60S, LCS, USV, UISS, OASIS



ZERO SUM



Transition from Legacy to Future



MCM program maintains current capacity without MCM-1 ELSP and supports LCS-based MCM to relieve forward deployed forces by 2020.



MCM + Mining = Mine Warfare

- The Mine Warfare Branch is responsible for both Mine Countermeasures(MCM) and Mining.
- Responsible for maintaining the current maritime mines in the Navy's inventory.



- Actively exploring future offensive mining concepts to use mines in offensive, protective, and defensive roles.





Current Resource Environment



- PB12 is currently on “The Hill”
 - CR until 18NOV and No New Starts
- Navy PB12 TOA is \$161.4B – increase of \$0.8B from FY11
 - N85 slice of the pie is \$6.2B – 4% of overall budget
 - N852 budget is approx \$400M of N85’s budget
- Overall Mine Warfare budget is \$722M
 - Includes current readiness and manpower accounts
 - 0.6% of Navy TOA – LCS SCN account excluded
 - BMD budget is approximately five times larger*
 - ASW budget is approximately four times larger*
- Still have the “Super Committee’s” decision to deal with

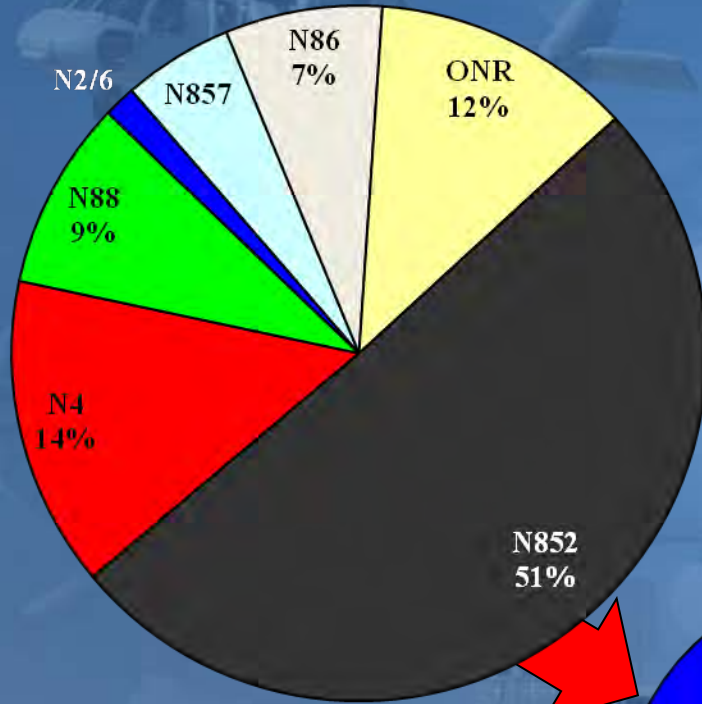


PB-12 Fiscal Overview



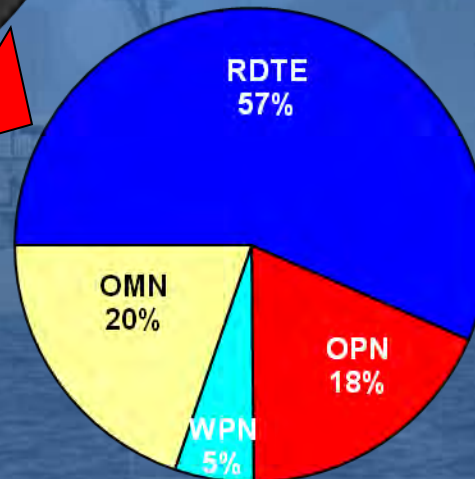
(Represents Funding Reported in FY12 MCM Certification Plan)

MIW Funding Ownership Breakout

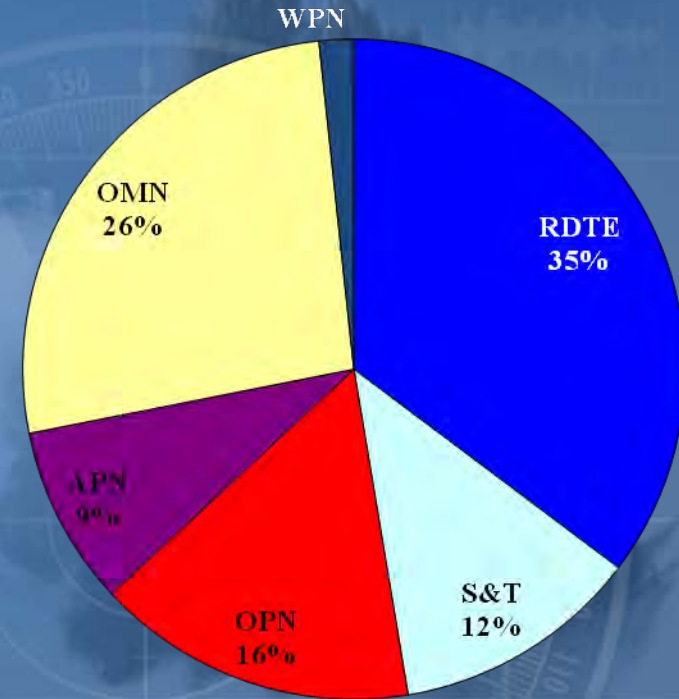


RS	\$M
N4	104.4
N852	366.1
N857	37.0
N86	52.8
N88	63.6
ONR	87.6
N2/6	10.8
Total	722.3

N852 APPN Breakout



MIW Funding APPN Breakout



APPN	\$M
RDTE	254.6
OPN	113.5
WPN	12.2
OMN	190.8
S&T	87.6
APN	63.6
Total	722.3

- N4 – Readiness
- N88 – Air Warfare
- N857 – EOD
- N86 – Surface Warfare
- ONR – S&T Funds
- N852 – Mine Warfare
- N2/6 – Info Dominance



Near Future MCM Challenges



- Sensor and Processing False Alarms
 - High False Alarms mean longer PMA & higher False Classification by PMA Operator
- Single Pass Detect to Engage
 - High False Alarms requires multiple passes to identify
- Computer Aided Detection(CAD)/Classification(CAC) Improvements
 - Potential for real-time algorithms in the MCM Community
 - Fast and accurate CAD/CAC capability needed for all PMA
- Reliability
 - System Reliability needs to meet requirements
 - Meet Operational Availability (Ao)
 - Improve Mean Time Between Operational Mission Failure (MTBOMF)
 - Require modular, open architecture systems that are supportable long term
- Mining
 - Stand-off delivery of mines
 - Remote Command and Control of mines
 - Distributed network of sensors in support of command and control





The Big Question: How good is good enough?

- How much better is the reduced performance future systems over present fielded systems?
 - Likely Performance of Future vs. Present Performance of Legacy
- Analyzing the present performance MCM MP systems to determine if they support Overarching LCS MCM MP KPPs.
 - Many Future MCM system requirements (ORDs) written well before LCS Concept—are they aligned?
 - Huge Effort, reliant on modeling (NMWS)
 - IF we are falling short in KPPs, namely Area Coverage Rate Sustained (ACRS), WHERE do we make improvements?

N85 assessing traceability of system requirements to MCM MP requirements



Summary

- The mine threat is real and not getting easier.
- The transition to LCS-based MCM is challenging...*and innovative*.
- Decreasing TOA makes TOTAL OWNERSHIP COST a key driver
- But.....system suitability and effectiveness still most important

Got a solution?

Contact CAPT Rios at mark.rios@navy.mil

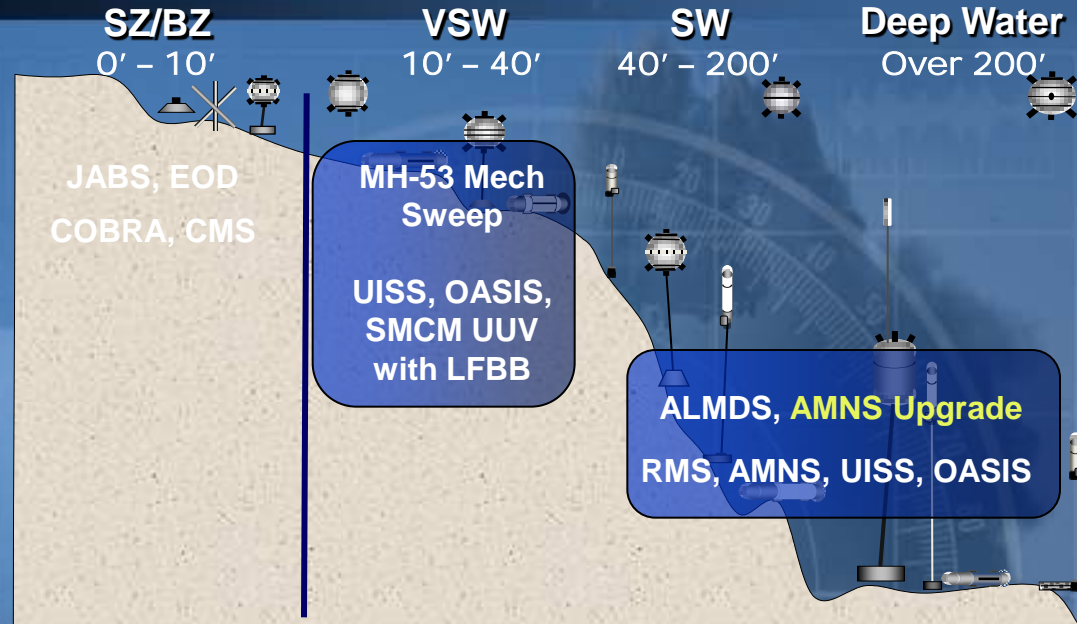


Questions



MCM System Investments

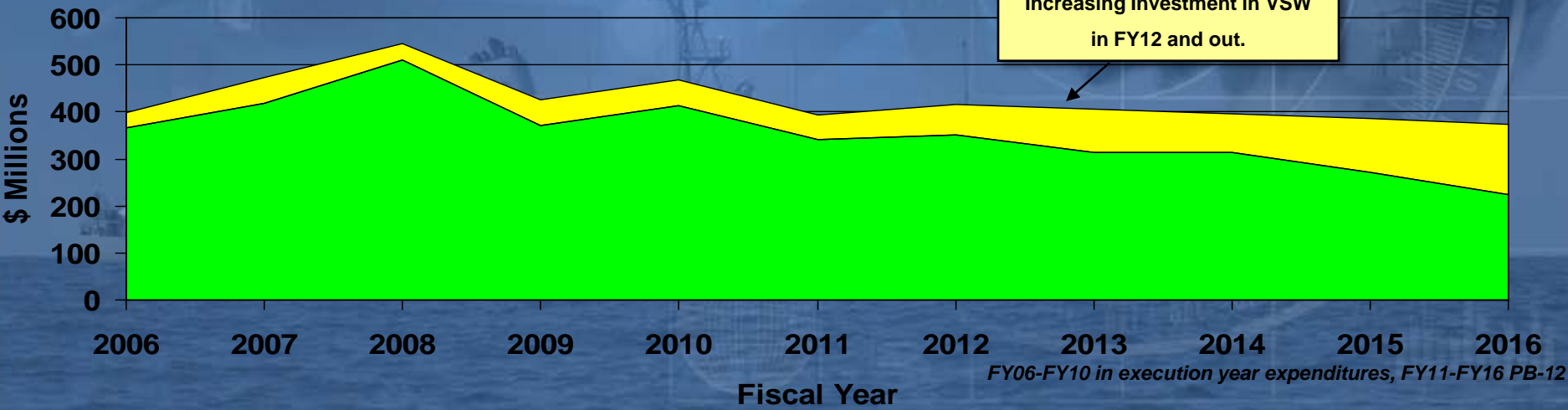
- **Greatest investment in the SW/DW**
 - 33% of FY11 budget allocated to legacy systems
 - Decreases to ~20% by FY16 as LCS-based systems fielded
- **Increased funding to the VSW zone**
 - JABS Upgrade
 - UUV with LFBB
 - Potential COTS solutions



• **Investments in SW/DW Sustain Legacy Force and Deliver the Future**

• **Initiatives to Solve the VSW Problem Are Underway**

Increasing Investment in VSW in FY12 and out.





MIW Far-Term Vision

- **Stop doing things “the old way”**
 - Increased passive MCM through ISR, satellites, and IPOE
- **Utilize Unmanned Undersea Vehicles (UUVs) and Unmanned Surface Vehicles (USVs)**
 - Comms, endurance, and power generation/management issues inherent with UUVs/USVs must be resolved
 - Flexible, adaptable, open architecture design. Stovepipes removed.
 - Idea: A common powered-section that can be fitted with a mission-specific “front end” (e.g., minehunting, neutralization, or even minelaying)
 - Idea: Air-dropped UUVs for rapid reaction. Need robust design while adhering to weight & aircraft/helo integration
- **Multiple, networked UUVs/USVs operating autonomously in suspected mine danger area**
 - Full Detect-to-Engage capability in a single pass

Far-Term => Autonomous, Networked UUVs and Advanced Underwater Weapons



Major PB-12 Adjustments



Program ADDS

RMS Add to OSD CAPE Estimate	\$ 101.7
EOD UUV (MK 18 UUV)	\$ 76.0
AMCM SDLM Add	\$ 38.4
ALMDS Add (Field Inc.1, Dev Inc II)	\$ 31.7
AMNS Add (RD TEN & OPN)	\$ 31.2

Program TAKES

MCM MP Reduction	-\$ 166.1
AMNS WPN Reduction (EMNS)	-\$ 110.1
RAMICS Vertical Kill	-\$ 82.1
CMS WPN Reduction	-\$ 54.9
EMNS Vertical Kill	-\$ 49.8
SMCM UUV Reduction	-\$ 32.9

- Aligns resources (LCS ships and MP system)
- Slowed procurement and quantities of CN's
- SMCM was bill payer for other MCM programs

16th Annual Expeditionary Warfare Conference

N853 Amphibious Warfare Branch

Col Chris Arantz

Date: 27 October 2011



Amphibious Warfare (N853)

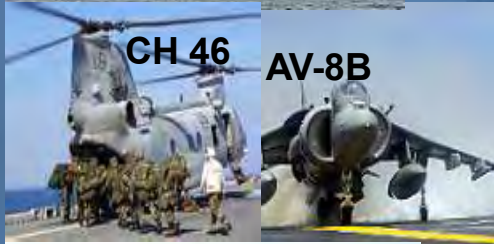
Amphibious Fleet Transformation



LHA/LHD



LPD 4/LPD 17



CH 46 AV-8B



MV 22



LCU



AAV



LHA 6



LHA(R) Flt 1



LPD 17/LSD(X)

AVIATION INTEGRATION



JSF



MV 22



ACV

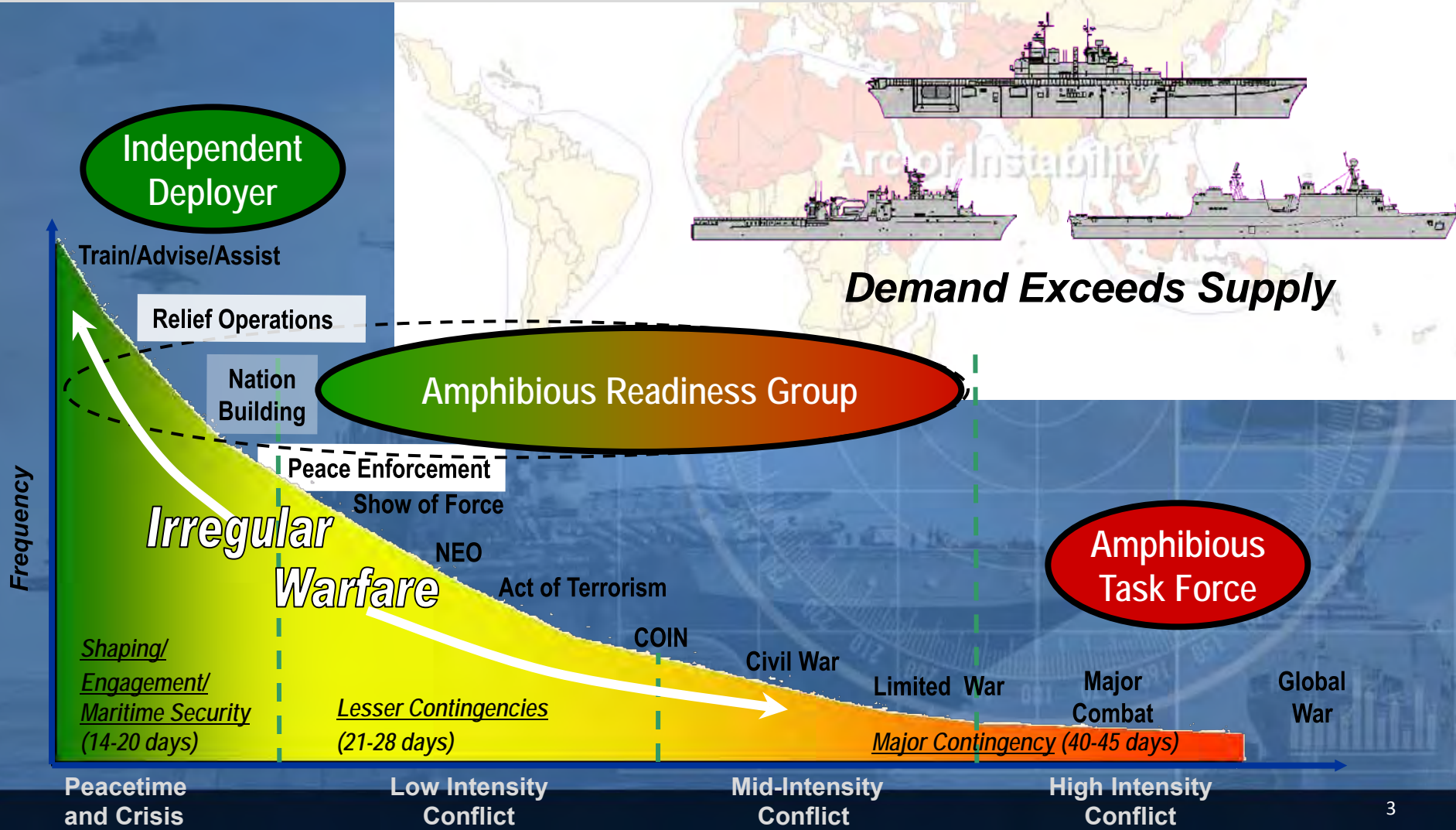
- Capability Driven Recapitalization
- Supports Larger/Heavier USMC Footprint
- Full Service Life Ship Modernization
- Supports Joint Strike Fighter Ops
- Supports MV-22 Osprey Ops
- Improved Command & Control
- Improved Self-Defense
- Increased Survivability

Operations from 1- 5 miles off beach

Sea-Based Operations from 12+ miles

Balanced Capability

"The future will be more complex, where all conflict will range along a broad spectrum of operations and lethality, where even near-peer competitors will use irregular or asymmetric tactics, and non-state actors may have weapons of mass destruction, mines, or sophisticated missiles." - Secretary of Defense Gates



Competition for Expeditionary Warfare

Future demand will only increase!

- **COCOM requirements for MEUs are increasing:**
 - Based on Global Force management Allocation Plan (GFMAP) baseline data
 - Demand (FY12): 4.44 MEUs
 - Sourced (FY12): 2.54 MEUs
- **Increased demand for independent Amphibious ship surge deployments:**
 - Demand (FY12): 4.41
 - Sourced (FY12): 0.93
- **Unique asset interoperability:**
 - AFSB / MCM requirements
- **Ship maintenance / upgrade availability periods**

Budgets will likely continue to decrease!

Table 1: Naval Forces Alignment with the Maritime Strategy

Core Capabilities Naval Forces	Forward Presence	Maritime Security	HA/DR	Sea Control	Power Projection	Deterrence
	Aircraft Carriers	X		X	X	X
Aircraft	X	X	X	X	X	X
Amphibious Ships	X	X	X	X	X	X
SSNs	X	X		X	X	X
SSGNs	X	X			X	X
SSBNs					X	X
Large Surface Combatants	X	X		X	X	X
Small Surface Combatants	X	X		X		
Major Cutters	X	X	X	X		X
Patrol Craft	X	X	X	X		X
Combat Logistics Force	X	X	X	X	X	
Hospital Ships	X		X			
Maritime Prepositioning	X		X		X	
JHSV	X	X	X			
Command and Support	X					
Icebreakers ³¹	X	X	X	X		X

“Since 2007 the COCOMs cumulative requests for Naval forces have grown 86% for ARG/MEUs and 53% for individual deployed amphibious ships.” NOC 2010

Amphibious Combatant Fleet Transformation

1990 62 Ships



LHD



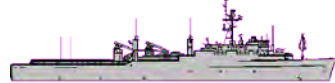
LHA



LPH



LPD 4



LSD 36



LSD 41



LST 1179



LKA 113

2011 28 Ships

**Requirement for 38 ships, risk
accepted at fiscally constrained
33 ship force structure**



LHA / LHD



LPD 4



LPD 17



LSD 41 / 49

2021 33 Ships



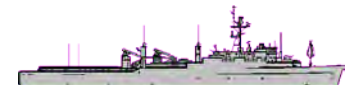
LHD / LHA (R)



LPD 17



LSD 41 / 49



LSD (X)

Amphibious Combatant Recapitalizations

- Capability-Based Assessment (CBA) completed covering:
 - LSD and LHA/D recapitalization
 - Projected USMC lift requirements (2024s timeframe)
 - USMC air/ground vehicles are becoming heavier/larger
- CBA studied Replacement options
 - For LSD Recap
 - LPD 17 design (repeat or modified repeat)
 - New design (small--similar to LSD 41/49 size)
 - New design (large--carry 100% of lift requirement)
 - For LHA/D Recap
 - LHA(R) Flight 0 (existing LHA 6 design)
 - LHA(R) Flight 1 Min (with well deck)
 - LHA(R) Flight 1 Full (expanded beam/reduced island w/ well deck)
 - LHD 8 Restart
 - New design (carry 100% of lift requirement)

CBA approved in March 2011 and is basis for follow-on efforts:

- *LHA(R) Flight 1 Capabilities Development Document revision*
 - *Study to identify Flight 1 ship design completed*
- *LSD(X) Initial Capabilities Document.*

RECAPITALIZING TO PROVIDE MODERN, AFFORDABLE AMPHIB FLEET



Major Program Update

LPD 17



- LPD 17 class are flexible, multi-mission ships
- Functionally replaces LPD 4, LSD 36, LKA 113, and LST 1179 Ship classes
- LPD 17 missions include:
 - Forward Presence,
 - Deterrence,
 - Sea Control,
 - Power Projection,
 - Maritime Security
 - Humanitarian Assistance / Disaster Response

LHA 6



- LHA 6 provides flexible, multi-mission platforms
- LHA 6 is a modified LHD 8 design
- Increased aviation capacity to better accommodate JSF/MV-22
- Provide adequate weight and stability margins for 40 year service life

LCAC SLEP

BUOYANCY BOX

- New buoyancy box thru FY03
- Refurbishment of buoyancy box in FY04 and beyond

ENHANCED ENGINES

- Provides additional power
- Reduces fuel consumption
- Reduces maintenance

ROTATING MACHINERY REFURBISHMENT

- Extends useful life of equipment
- Reduces maintenance

C4N REPLACEMENT

- Introduces Open Architecture
- Introduces modern COTS equipment
- Provides precision navigation
- Provides Common Tactical Picture
- Provides Comm Suite interoperability

DEEP SKIRT

- Reduces drag
- Increases performance envelope
- Reduces maintenance
- Increases obstacle clearance

FY04 Recipient of the DoD Value Engineering Award



SEP 11: 33 of 72 SLEPs complete

- Preserves amphibious warfare triad (LCAC / EFV/MV-22)
- Allows execution of Operational Maneuver From The Sea (OMFTS) and Ship to Objective Maneuver (STOM)
- Deferred requirement to fund next generation LCAC from FY00 to FY10
- **Challenges**
 - COTS obsolescence, Technology Insertion
 - Growth work increasing due to the degraded condition of the craft entering SLEP availabilities

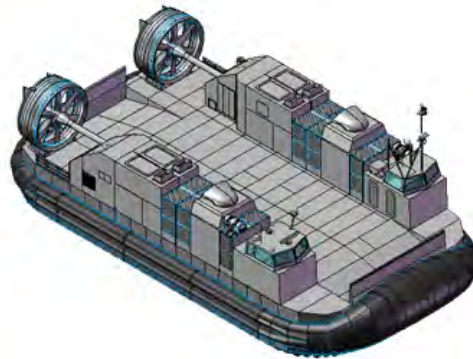
Ship to Shore Connector (SSC) / LCAC 100

Mission: Land Surface Assault Elements of USMC from ship to shore

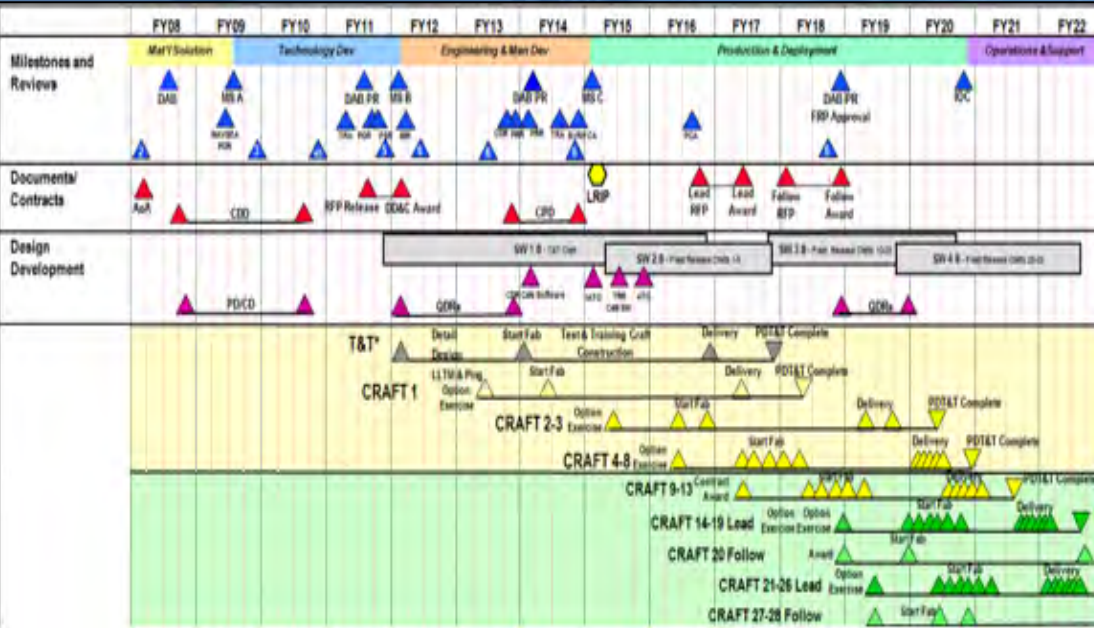
Description: Landing Craft Air Cushion (LCAC) replacement

Platforms: Air Cushion Vehicle; Same footprint as LCAC SLEP

Employment: Ship to shore surface connector in support of STOM and MPF(F)



- Mission: conduct ship-to-shore movement in support of surface assault elements of the MAGTF
- LCAC replacement possesses same footprint as LCAC SLEP
- Detailed Design and Construction Contract Award Pending FY12.



LCU (RECAPITALIZATION)



- AMW OAG has ranked this as a top five Fleet need over the last three years
- Current LCU 1600 craft have an average age of 40 years and suffer from obsolescence and increased maintenance costs

Way Ahead

- Brief to Naval Capabilities Board for approval to initiate ICD Oct 11.
- Anticipate ICD completion Jan 12.
- Analysis of Alternatives (AoA) Summer FY12

“No one craft can do it all.”

	LCAC (SLEP)	SSC	LCU
High Speed (>25 kts)	●	●	●
Beach landings in Assault Echelon	●	●	●
Access to world beaches	●	●	●
Dry-Well Operations	●	●	●
Heavy-Lift	75 ST*	75 ST*	147 ST
Platform for buoyant hose fuel systems	●	●	●
Beach landings in AFOE	●	●	●
Extended (10 day) Ops (SOF/Riverine)	●	●	●
Independent Operations	●	●	●
Afloat Forward Staging Base (small boats)	●	●	●
Peacetime port operations	●	●	●
Passenger (400 per craft) Ferry	●	●	●

* Limited by temp and sea state

LSD MID LIFE

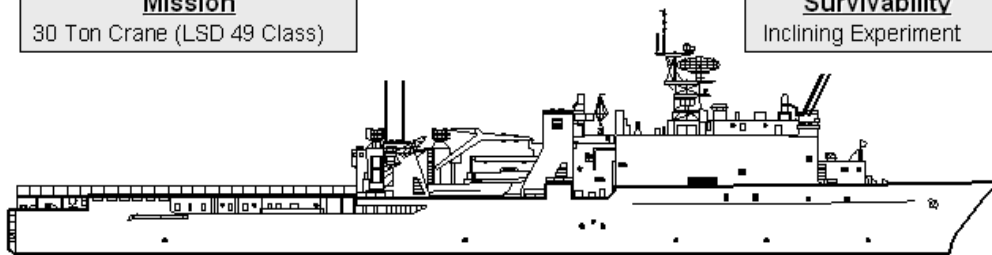
Ensure ships reach expected 40 year service life

Mission

30 Ton Crane (LSD 49 Class)

Survivability

Inclining Experiment



Technology Insertion

- Advanced Engineering Control System (AECS)
- LAN
- Machinery Monitoring System (MCS)
- Steering Control System (SCS)
- On Board Trainer (OBT)
- DEXTER
- Electronic Gov Act (Digital Fuel Rack Control)

Hull Mechanical & Electrical

- Fuel & Engine Maint Savings Sys (PLMU)
- All Electric & Distribution Upgrade
- Power Mgmt Platform (PMP)
- Additional A/C Plant
- CW Distribution Mods
- SSDG Lube Oil Polisher
- LPAC Replacement (LSD 41 Class)
- Canned Lube Oil Pump (CLOP)

- Return ships to capable Fleet Asset status; able to meet amphibious mission requirements through 2038
- Objective is to
 - Improve declining material condition and readiness,
 - Replace obsolete equipment and
 - Reduce total ownership costs through technology insertion
- USS HARPERS FERRY (LSD 49) EDPMA began in Jul. Seventh LSD Class ship to undergo modernization
- USS ASHLAND (LSD 48) and USS TORTUGA (LSD 46) will swap homeports (Norfolk/Sasebo)

Installs Per FY: 2 - 2 - 2 - 2 - 2 - 1

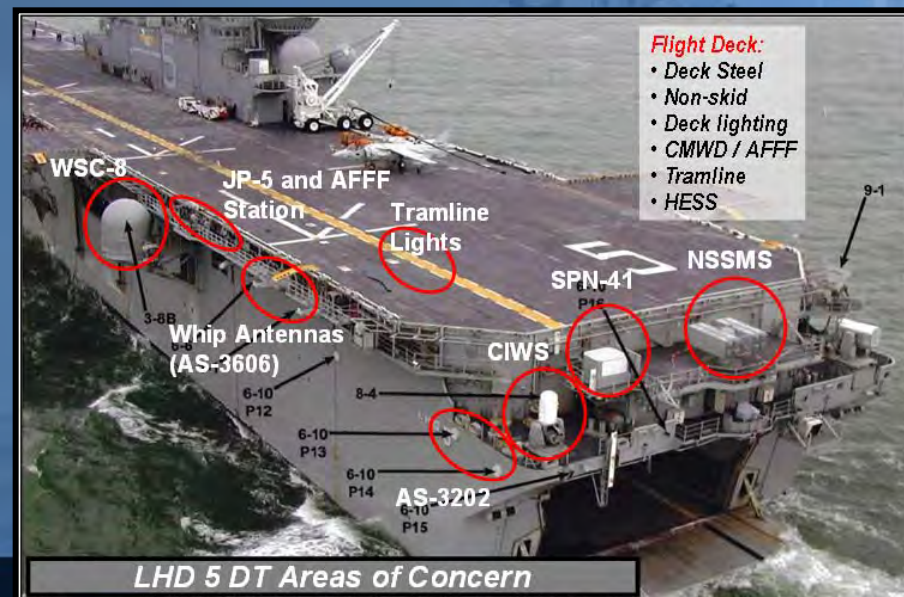
NAME	HOMEPORT FOR EDPMA	2009				2010				2011				2012				2013				2014				2015		
		Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3			
GUNSTON HALL	NORFOLK																											
GERMANTOWN	SAN DIEGO	12/3							5/7																			
WHIDBEY ISLAND	NORFOLK		3/11						3/8																			
FORT MCHENRY	NORFOLK							5/10					5/6															
RUSHMORE	SAN DIEGO							7/21					7/20															
ASHLAND	NORFOLK									2/1							1/25											
HARPERS FERRY	SAN DIEGO											7/13					5/30											
COMSTOCK	SAN DIEGO												1/25								1/23							
OAK HILL	NORFOLK												3/7								1/23							
TORTUGA	SAN DIEGO															1/15					1/15							
CARTER HALL	NORFOLK																				8/7				6/25			
PEARL HARBOR	SAN DIEGO																				1/15				11/19			

Legend: Blue bar = East Coast, Green bar = West Coast

LHD MID LIFE AND JSF INTEGRATION

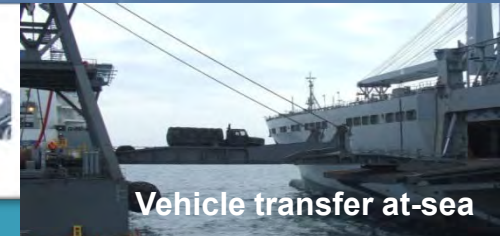


- Essential modernization and mission improvements to reach 40 yr service life
- Nine identified ship changes required for JSF on LHDs funded with fielding plans in place
- Six cornerstone alterations – nine separate SCDs – identified
- Enabler ship alterations
 - MV 22 service and shop mods (hangar and stowage)
 - Fuel Oil Compensation (stability)
- JSF Integration
 - JSF External Environment mitigation pending technical analysis

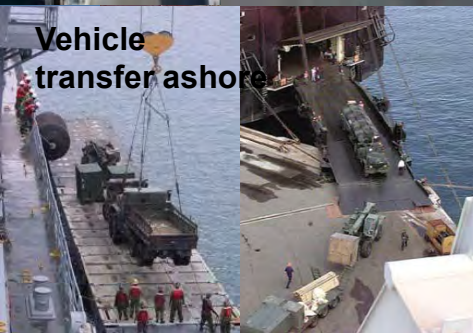


Enhanced MPSRON

Current Practices



Vehicle transfer ashore

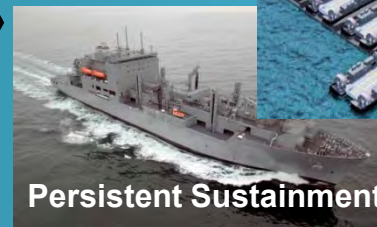


- Transfer of equipment at sea in non-anchorage depths
- Delivery of equipment and supplies through restricted access environments
- Selectively offloadable, tailorable force packages
- Afloat warehousing, delivering unitized loads from ship to objective
- Employable in emergent, partnership and combat across complete ROMO

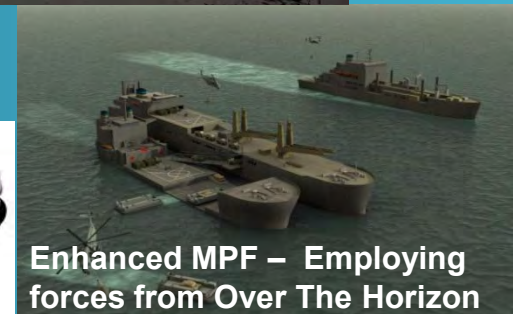
LCAC/MLP Interoperability



Persistent Sustainment



Enhanced MPF – Employing forces from Over The Horizon



MPF - The "Iron Mountain" . . . Dependent and Cumbersome



FLEXIBILITY THAT PERMITS INFLUENCING EVENTS ASHORE OR AT SEA, PARTICULARLY WHEN DENIED ACCESS OR A FOOTPRINT ASHORE

MPF Alternative Posture

2 MPSRONS FOS/1 MPSRON ROS

Overview

- DoN submits to SECDEF Afloat Preposition alternative
- OSD approves (RMD 7000) 25 Jan 2011
Transfers 1 of 3 MPSRONS to a Reduced Operating Status (ROS-5).
- Tethers ROS-5 MPSRON on East Coast
- Two MPSRONS remain forward positioned in USPACOM - Full Operating Status (FOS)
- 1 LMSR (current TRANSCOM asset) to replace 2 legacy ships

Assessment

- POM-12 efficiency realized by reducing MPF Program O&M costs.
- FOS MPSRONS supports presence, crisis response, OPLAN and CONPLAN responsiveness in PACOM and CENTCOM
- ROS MPSRON in addition to supporting MCO provide surge capability to EUCOM, AFRICOM, and SOUTHCOM
- Provides operational flexibility for all CCDRs
- Reorganization must be completed by 1 Oct 2012 (FY13 funding supports 2 FOS/1 ROS)

2 MPSRONS FOS/1 MPSRON ROS-5

20 Ships Total



**X 4 [FY12 1 from
TRANSCOM]**



X 3 [FY14-16]



X 3 [FY12-13]



X 6



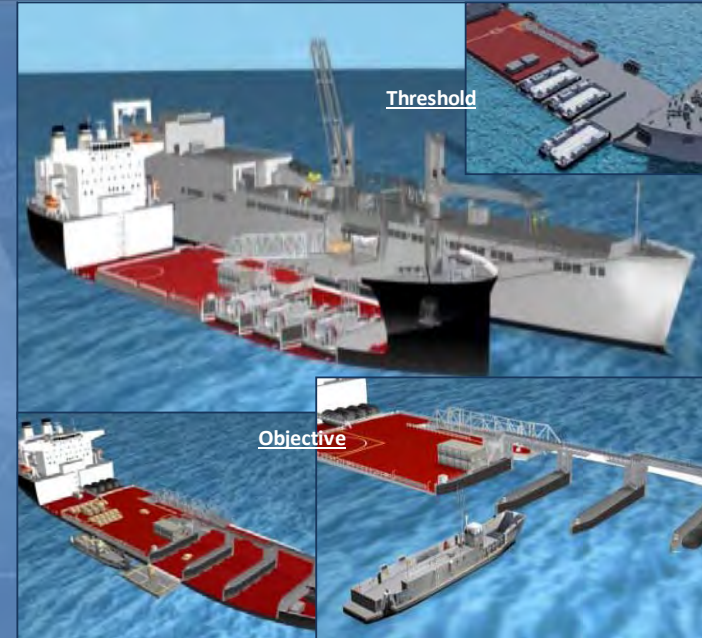
X 3



X 1 Swing Ship

Enhanced Maritime Prepositioning Squadron

- The Enhanced MPSRON will have an added capability for vehicle and equipment at sea transfer between ships and delivery ashore from over the horizon through restricted access environments, and provide persistent sustainment from ship to objective.
- MLP will provide a surface interface between Large Medium Speed Roll-on/roll-off (LMSR) ships and LCACs. Total MLP procurement is three, two were awarded in FY11 and one is planned for FY12.
- T-AKE will contribute to prepositioning the Baseline MEB's supply stocks and sustaining the forces operating ashore. As a floating warehouse it will minimize the logistic footprint ashore and support vertical replenishment of unitized sustainment direct from ship to the operating forces ashore. Total of three T-AKEs will be transferred from the CLF in FY12/13.



MLP **FY10** **FY11** **FY12** **FY13** **FY14** **FY15** **FY16**

Lead Vessel Schedule

Detail Design
↓
SOC Construction BT AT DEL FCT IOC

Follow Vessel Schedule

Ship 2 Award SOC Construction BT AT DEL FCT

Ship 3 Award SOC Construction BT AT DEL FOC

Core Capabilities Set (CCS)

Gov't Led Definition and Design DD&C Award DEL DEL DEL
Release RFP 1 2 3 1 2 3
SOC SOC SOC Integration

A large cargo ship is silhouetted against a sunset sky over the ocean. The sky transitions from a deep blue at the top to a bright orange and yellow near the horizon, with scattered dark clouds. The ship is positioned in the middle ground, centered horizontally.

Questions?

N857

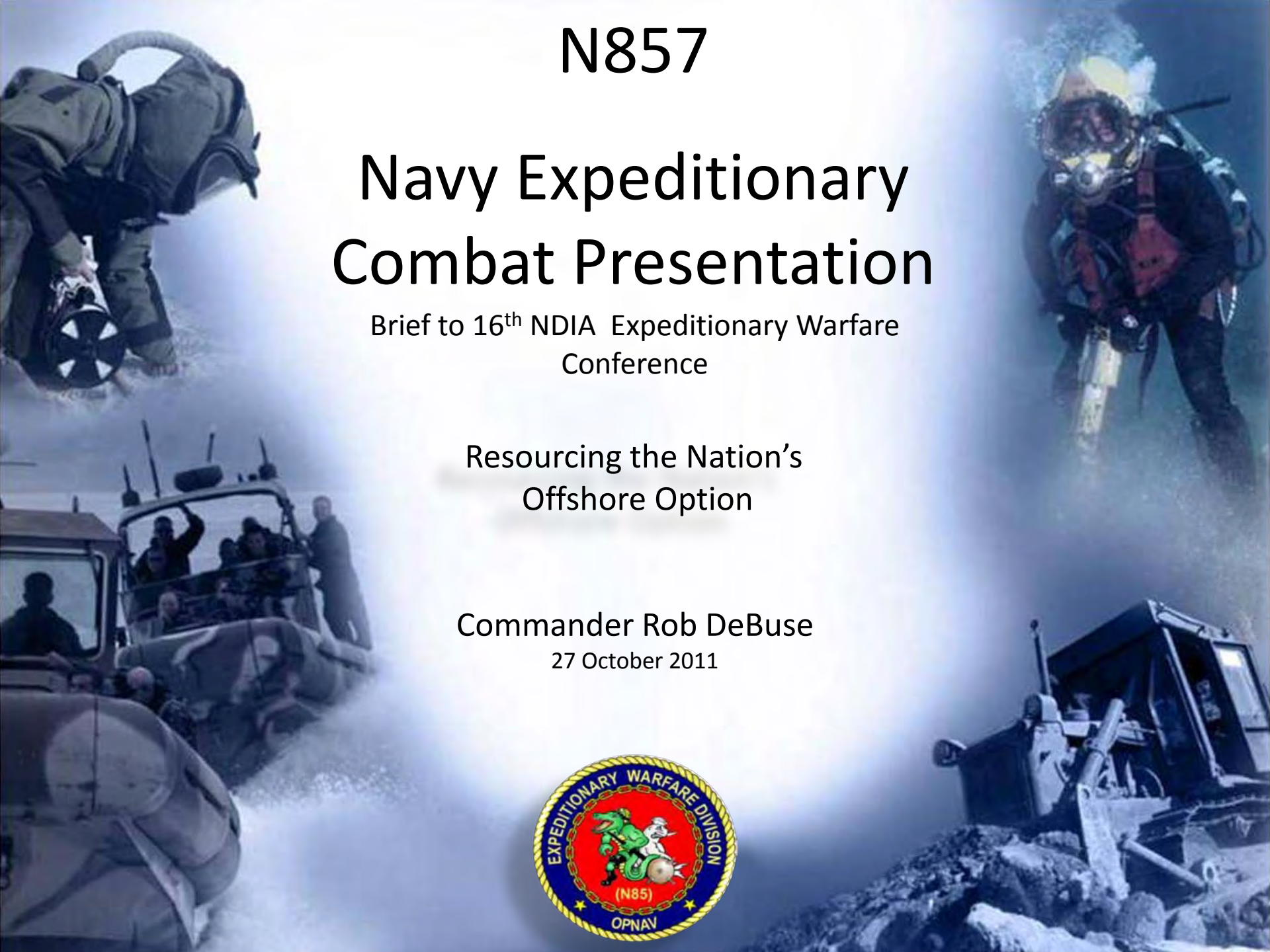
Navy Expeditionary Combat Presentation

Brief to 16th NDIA Expeditionary Warfare
Conference

Resourcing the Nation's
Offshore Option

Commander Rob DeBuse

27 October 2011





Endstate: Meet Challenges in an Uncertain Era

- Operating forward across the globe, the Navy will provide the nation offshore options to win today and advance our interests in an era of uncertainty.
 - Chief of Naval Operations, Admiral John Greenert, "CNO's Sailing Directions" October, 2011
- Our guiding principle going forward must be to develop technology and field weapons that are affordable, versatile, and relevant to the most likely and lethal threats in the decades to come, not just more expensive and exotic versions of what we had in the past.
 - Former Secretary of Defense Robert M. Gates, Washington, DC, Tuesday, May 24, 2011
- In short, we are zero for four in successfully managing defense drawdowns. Each time we reduced the defense budget, we created holes in our military capabilities that had to be bought back at great cost. When we are lucky, that cost was only in dollars. When we are not, the cost is in the lives of our troops.
 - Former Deputy Secretary of Defense William J. Lynn, III, Center for American Progress, Wednesday, October 05, 2011

Means: Overarching Acquisition Principles

- Balance technology between current warfighter demand AND the future threat
 - Warfighter demand alone doesn't define the effort
 - OEF/OIF/OND – Must get inside the enemy's OODA Loop
- A streamlined RDT&E process that enables acquisition of future programs that are
 - Strong
 - Defendable
 - Responsive
 - Affordable
- Absolutely vital that the S&T process 'feed, complement, and accelerate' our acquisition process
- Identify 'common' joint systems and leverage current and projected acquisition POR initiatives

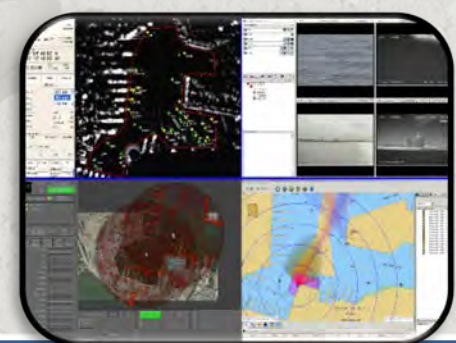
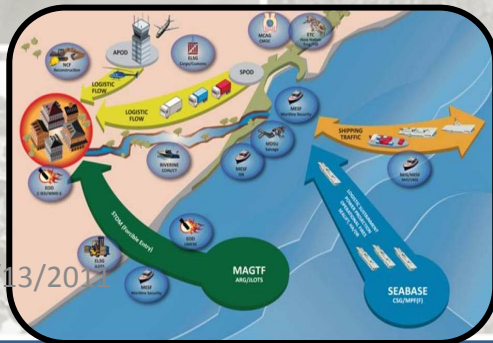
Ways: General Capabilities We Need

Flexible, Responsive,
Modular, Ready for
Use Systems

- Common architecture (C2)
- “Plug and play” compatibility for unique requirements
- Robust “reachback” capability
- Deployable equipment
- Stock configured for immediate use
- Platform and equipment commonality
- Solutions leverage COTS/GOTS

Consistently more
rapid than the
enemy’s OODA-loop

- Improved sensors
- Autonomous, task-driven systems
- Detect & predict threats (UW, littorals)
- Provide persistent COP
- Joint interoperability
- Open architecture (time and cost savings)
- Multi-mission applicability



Ways: Specific Capabilities in Development

Non-Lethal Effects

- Stand off vessel/vehicle stopping
- Reduced size, weight, and cost of directed energy systems
- Increased range of fielded systems

Unmanned Programs (Air and Surface)

- Modular Unmanned Surface Craft Littoral
- Nighthawk/Seahawk
- Advanced EOD Robotic System
- Advanced Composite Riverine Craft

UMCM UUV Programs

- Mine detect / classify from surf zone to high-water mark
- Organic MCM Without Cued ISR
- Limpet Mine Removal Tool
- U/W Explosive Object Recovery



Ways: Energy and C5I Initiatives

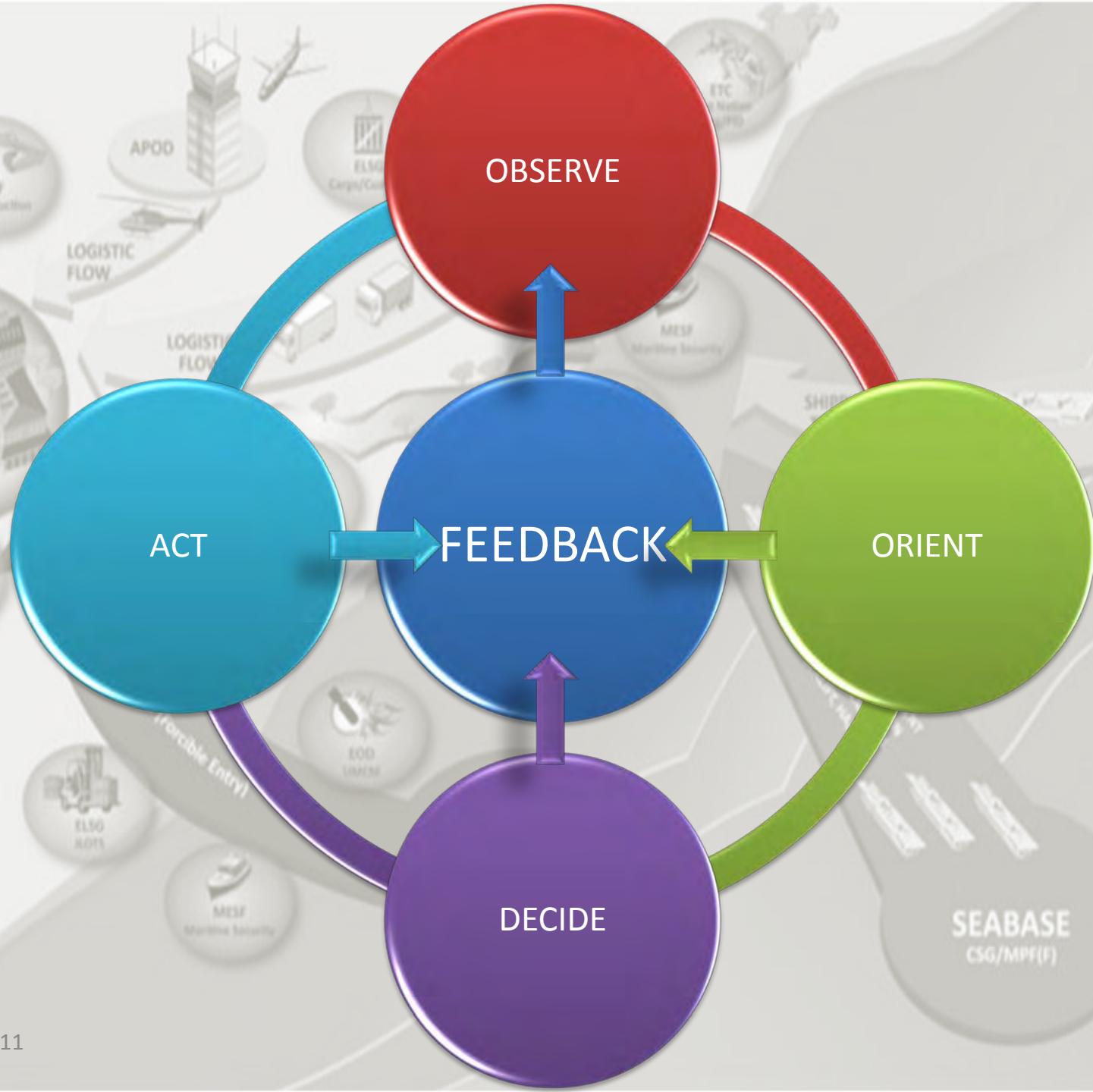
Energy Efficiency

- Improved Environmental Control Units
- Hybrid CESE
- Alternate energy sources for expeditionary tent camps
- Solar/Wind Power
- Solar-powered Water purification
- Power Management and Distribution
- Onboard Vehicle Power
- Universal Power Supply

C5ISR Systems


- Joint Expeditionary C3 (JEC3) System
- Migration to Deployable Joint C2 (DJC2) Components
- Blue Force Tracker (BFT)/Combat Identification (CID)





Bottom Line

- Understand the threat, trends, and requirements
- Look at what capability you can provide, articulate the product or service, and feed it to one of our stakeholders
- Constantly re-examine if your capability can be tailored, adapted, massaged, improved, and lightened to meet the needs of our NECC warfighters' requirements



"I am very impressed and amazed with the way the U.S. Navy has adapted to meet new threats and challenges over the past decade. In Colombia we have over 15,000 kilometers of rivers that our forces are responsible for, and we are engaged in combat almost every day. Seeing NECC's capabilities gives me hope for an even stronger partnership in the future."

*- Adm. Alvaro Echandia Duran
Commander of Colombian Naval Forces
Aug. 18, 2011*



Engaging N857

Force/Commodity Managers

Financial Management	Mr. "Beef" Williams	wellington.williams@navy.mil
MESF/Sub-surface Defense	CDR Dana Reid (USCG)	dana.reid@navy.mil
EOD/JEOD/MDSU/JCREW	CDR Rob DeBuse	robert.debuse@navy.mil
Non-lethal Weapons	Corey Noel	corey.noel@navy.mil
MCAS/ECRC/ETC/NEIC	Mike Polidoro	michael.polidoro@navy.mil
NCF/Tactical Vehicles/ELSG	George Wenchel	george.wenchel.ctr@navy.mil





Questions





Expeditionary Warfare Conference October 27, 2011



**Joint High Speed Vessel (JHSV) and
Mobile Landing Platform (MLP)
Program**

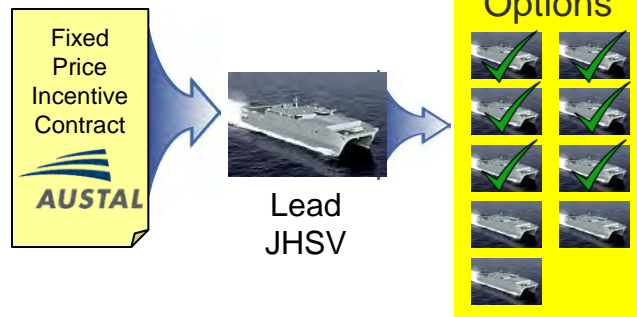
**CAPT Henry Stevens III
Strategic and Theater Sealift
Program Manager, PMS 385**



JHSV Overview

Program Structure:

Post Milestone B. The Navy awarded a fixed price incentive contract on November 13, 2008 to Austal USA in Mobile, Alabama for detail design and construction of the lead JHSV plus 9 JHSV ship construction options. Program is on schedule.



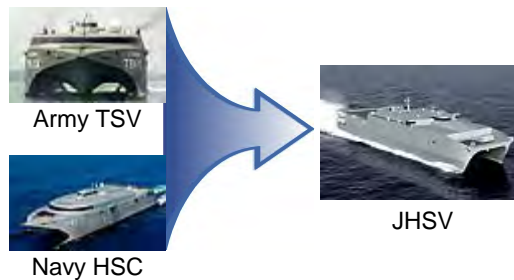
Commercially Based:

Leverages extensive commercial investment in high speed vessels possessing organic cargo handling capability to provide effective, affordable military capability from a non-developmental item.



Joint:

Merges Army Theater Support Vessel (TSV) and Navy High Speed Connector Programs. Leverages Navy's Core Ship Acquisition Competency. Provides cost effective, common logistics support platform for Army, Marine, and Navy warfighters.



Rapid Transport:

Focused technology to meet warfighting needs. Provides COCOMs a 35 knot intra-theater transport of 600 st of combat ready units over 1200 nautical miles with ability for off-load in austere environment without reliance on shore infrastructure.



Streamlined Acquisition:

Concept to Shipbuilding Contract in 2 ½ years with scheduled ship delivery 36 months after contract award. Both span times represent 50% time savings from a typical development and ship construction approach. Keys to success: (1) Stable requirements; (2) Minimize change; (3) Production Efficiency

Typical



JHSV





JHSV Characteristics

Characteristics

LENGTH	103.0 m (337.9 ft)	ALUMINUM CONSTRUCTION	
BEAM	28.5 m (93.5 ft)	CREW	42 p
DRAFT(F)	3.91 m (13 ft)	TROOP SEATS	312 p
FULL LOAD	2400 mt (2362 Lt)	TROOP BERTHS	104 p

Machinery

- (4) MTU 20V8000 M71L Diesel Engines (9.1 MW each, 36.4 MW total)
- (4) ZF 6000NR2H Reduction Gears
- (4) Wartsila WLD 1400 SR Waterjets
- (4) IF V1312C2ME-HPCR Diesel Generators (600 kW each, 2.4 MW total)

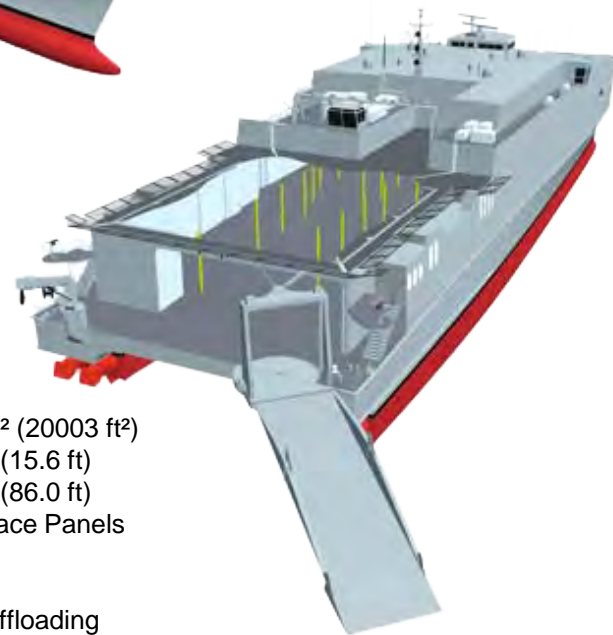
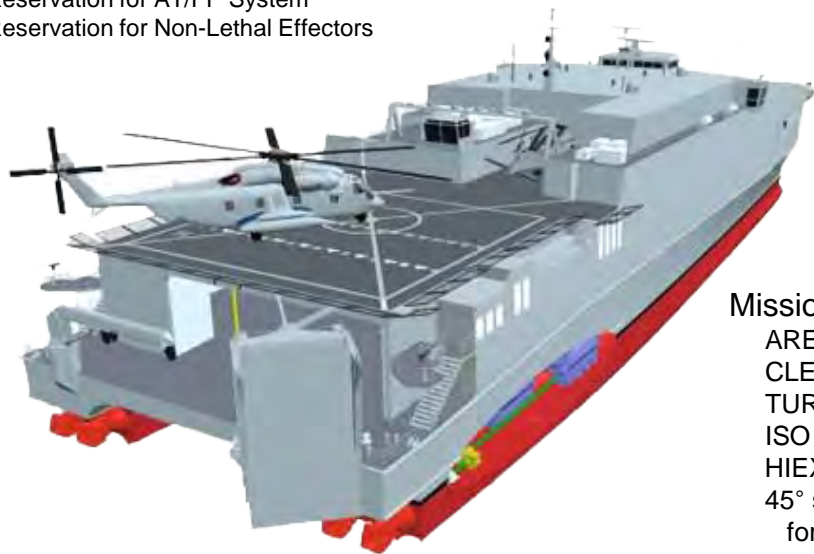
Aviation Facilities

- NAVAIR Level 1 Class 2 Certified Flight Deck for one helicopter
- Centerline parking area for one helicopter
- NAVAIR Level 1 Class 4 Type 2 Certified VERTREP
- Helicopter Control Station



Armament

- (4) .50 Caliber Machine Guns
- Reservation for AT/FP System
- Reservation for Non-Lethal Effectors

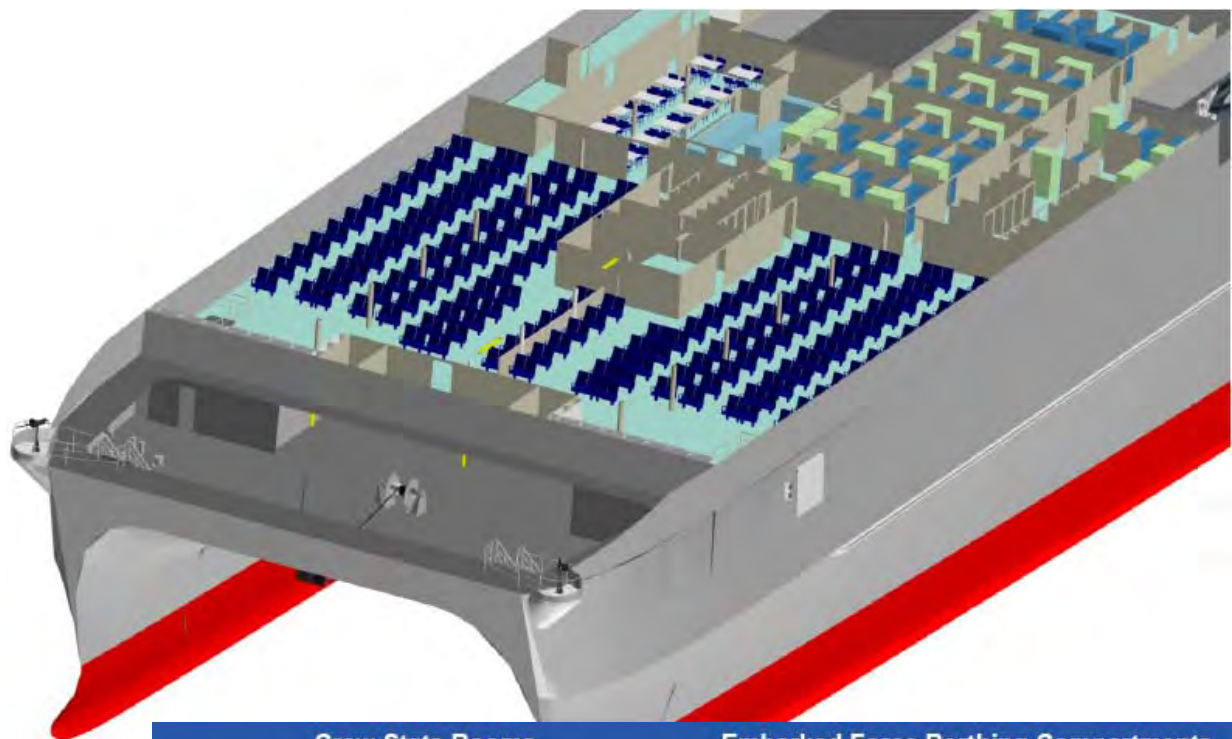


Mission Bay

AREA (with Tie Downs)	1858 m ² (20003 ft ²)
CLEAR HEIGHT	4.75 m (15.6 ft)
TURNING DIAMETER	26.2 m (86.0 ft)
ISO TEU STATIONS	6 Interface Panels
HIEX Foam Firefighting System	
45° slewing articulated quarter ramp for rapid and efficient loading and offloading	



JHSV Troop Accommodations



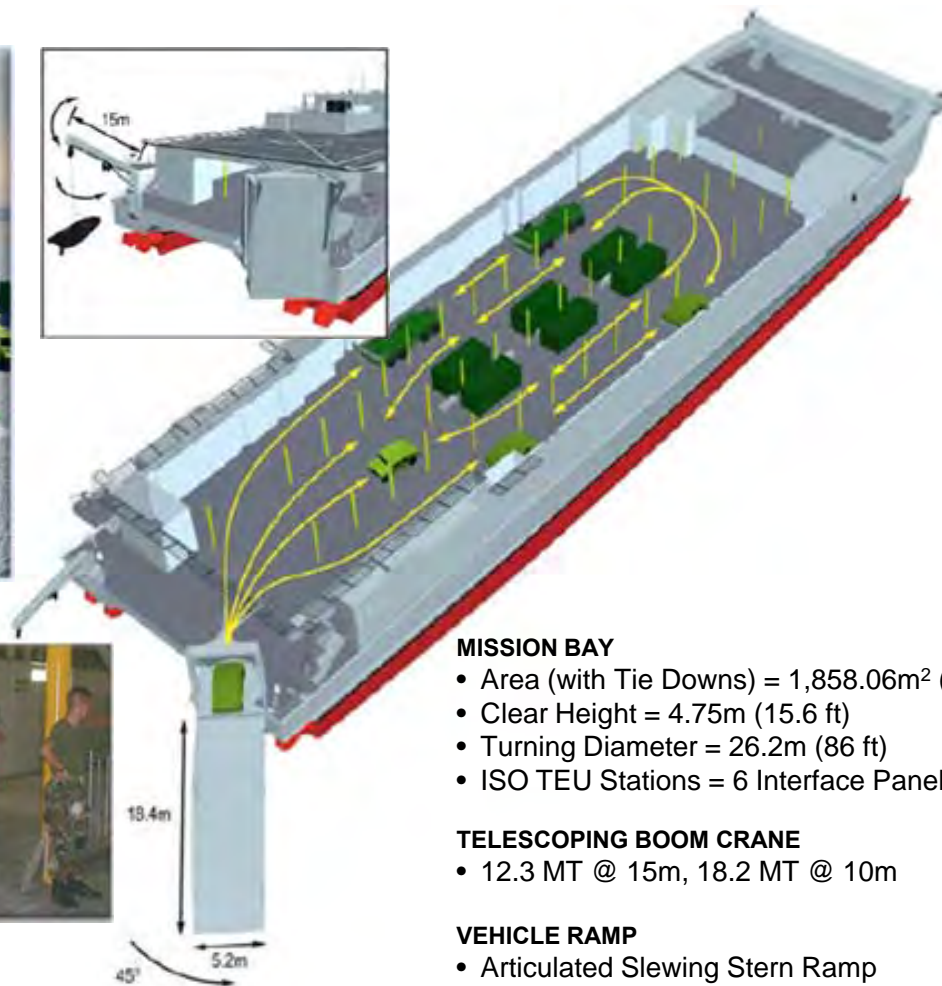
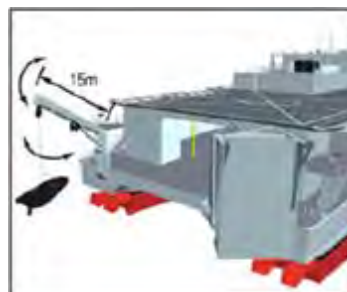
ACCOMMODATIONS

- Crew = 42 p
 - 2 x Single SR
 - 6 x Double SR
 - 7 x Quad SR
- Troop Seats = 312 p
- Troop Berths = 104 p
- Galley & Messing = 48 p





JHSV Mission Bay



MISSION BAY

- Area (with Tie Downs) = 1,858.06m² (20,000ft²)
- Clear Height = 4.75m (15.6 ft)
- Turning Diameter = 26.2m (86 ft)
- ISO TEU Stations = 6 Interface Panels

TELESCOPING BOOM CRANE

- 12.3 MT @ 15m, 18.2 MT @ 10m

VEHICLE RAMP

- Articulated Slewing Stern Ramp
- Straight Aft to 45° Starboard



WestPac Express Operational Experience



Aviation Capability and Support

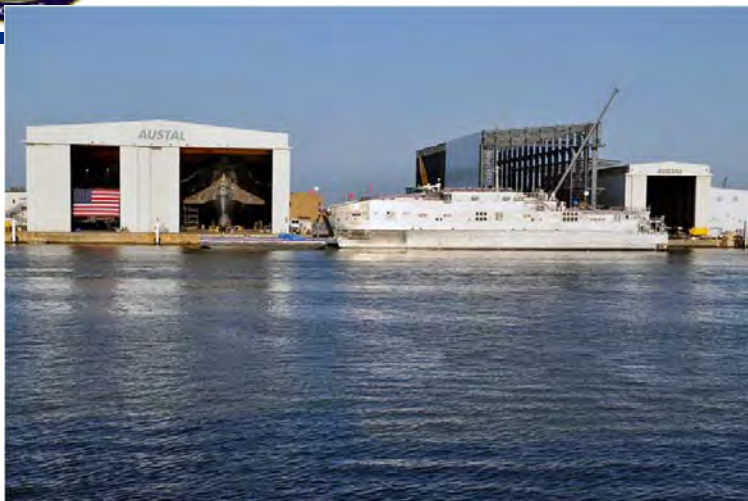


- Land, Launch and refuel in up to Sea State 3, Day/Night all weather CH-53, H-60 & H-46 aircraft.
- Level 1 Class 2 (limited services)
- Class 4 Type 2 VERTREP, H-60, H-46, H-47, H-53, V-22
- Helo wash-down facilities available





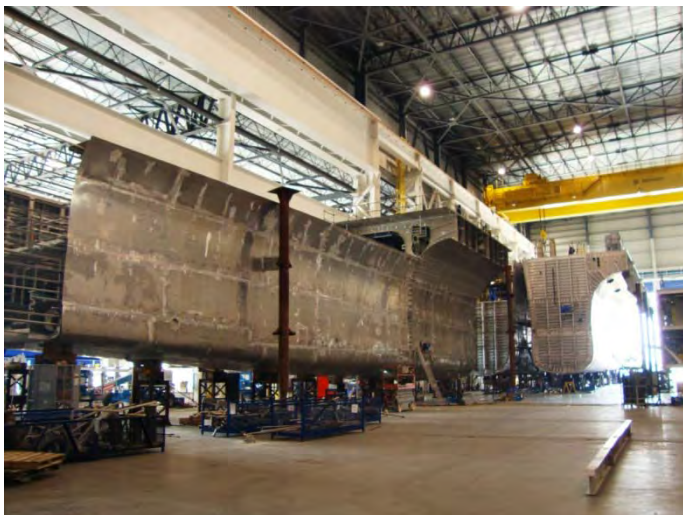
JHSV Production Progress



JHSV 1 (Spearhead) at pier for Christening



JHSV 1 (Spearhead) Test and Activation



JHSV 2 and 3 Under Construction



JHSV Program Way Ahead



- **JHSV 2 Keel Laying (1st Qtr FY 2012)**
- **JHSV 1 Builder's Trials/Acceptance Trials (Winter 2011)**
- **JHSV 1 Delivery (2nd Qtr FY 2012)**
- **JHSV 3 Keel Laying (2nd Qtr FY 2012)**
- **JHSV 1 Post Delivery Test & Trials (3rd Qtr FY 2012 – 1st Qtr FY 2013)**



MLP Overview

Program Structure:

Navy awarded National Steel and Shipbuilding Company (NASSCO) a contract on February 13, 2009, for Systems Design (SD) Part 1, with an option for SD 2. Advance Design awarded August 13, 2010. Detail Design & Construction contract for MLP 1 and 2 was awarded May 27, 2011, and a contract option for Long Lead Time Material for MLP 3 was awarded June 30, 2011.

- ✓SD1
- ✓SD2
- ✓AD

✓Awarded

DD&C

- ✓MLP 1
- ✓MLP 2
- MLP 3

Delivers Joint Warfighter Equipment

Each MLP provides:

- 3 LCAC berths, Skin-to-Skin ramp & fenders
- 25,000 sq. ft. Raised Vehicle Deck



Commercially Based

Designed/constructed to commercial ship standards. Navy standards and certifications applied to mission-related ship functions. Operated by a 34-person Military Sealift Command crew.



MLP at Delivery



Sea Base Surface Interface Hub

Enables personnel and equipment transfer from MPF(F) LMSR and JHSV to shore via LCACs in Sea State 3 conditions.



Core Capability Set

Government designed. Constructed under separate contract.





Mobile Landing Platform (MLP 1)

ACCOMMODATIONS

	Lic/ Off	CPO/ SNCO	Unlic/ OEP	Total
MSC	15	-	19	34
Spares	0	-	0	0
Standing Detach.	0	0	0	0
NSE	0	0	0	0
Troops	0	0	0	0
Total	15	0	19	34

Habitability: Based on BP Tanker standards, MSC crew in single staterooms with 1 exception of one two-person stateroom

MACHINERY SYSTEMS

- Commercial Diesel-Electric Propulsion
- Integrated Electric Plant
- 4 x 6.1 eMW Medium Speed Diesel Generators
- 6.6 kV Electric Propulsion System
- 2 x 10.0 MW at 85 rpm Synchronous, Variable Speed, Reversible Propulsion Motors
- 1,000 kW Emergency Diesel Generator
- 2 x 7.45 m diameter propellers
- 1 x 2,000 kW Azimuthing Bow Thruster (DPS-0)



AUXILIARY SYSTEMS

- All-Electric Auxiliaries
- Ballast System: 4,000 m³/hr, up to ~20m draft
- A/C Plants 2x85 ton
- Stores Cranes: 2 x 5 mt capacity

COMMAND & CONTROL

- Legacy BP Tanker Navigation and Communication
- Integrated Navigation Bridge System
- SOLAS Communications for Sea Area III
- 2 x Differential GPS
- 3 cm (X-band) & 10 cm (S-band) radars

INTERFACE STATIONS SERVICES

- | | | |
|-----------------------|----------------------|------------|
| Seawater cooling | AFFF | JP-5 |
| Seawater firefighting | Electric power | Oily waste |
| Telephone | Distilled water | Food waste |
| General announcing | Potable water | DFM |
| General alarms | LP air | |
| NIPRNET | Sewage discharge | |
| SIPRNET | Grey water discharge | |

CARGO CAPABILITIES

- Mission Deck: 154.7 x 50m
- Mission Deck Area: 7,735 m²
- Lift Capacity: 23,000 mt @ 9m submergence with fixed ballast
- Deck Load Capacity: 20 mt/m²
- JP-5 Stowage: 380,000 gal
- Potable Water Stowage: 100,000 gal
- Potable Water Generation: 25,000 gal/day

LIFESAVING

- USCG Certified (Cargo & Misc. Vessels)
- Lifeboats: 2 x 46 person (one ea. P/S))
- Rescue Boat: 1 x 7m RHIB
- Liferafts: 2 x 25-person (two ea. P/S aft) 1 x 10-person (one ea.. P/S fwd)

DIMENSIONS

- Length, LBP: 233.2 m
- Length, Overall: 239.3 m
- Beam, DWL: 50.0 m
- Full Load Departure Draft: 9.0 m
- Load Line Draft: 12.0 m
- Depth, Mission Deck: 15.5 m
- Depth, Upper Deck: 28.0 m

STABILITY

IAW IMO (SOLAS) and 46 CFR

HULL STRUCTURE

Commercial, ABS Steel Vessel Rules

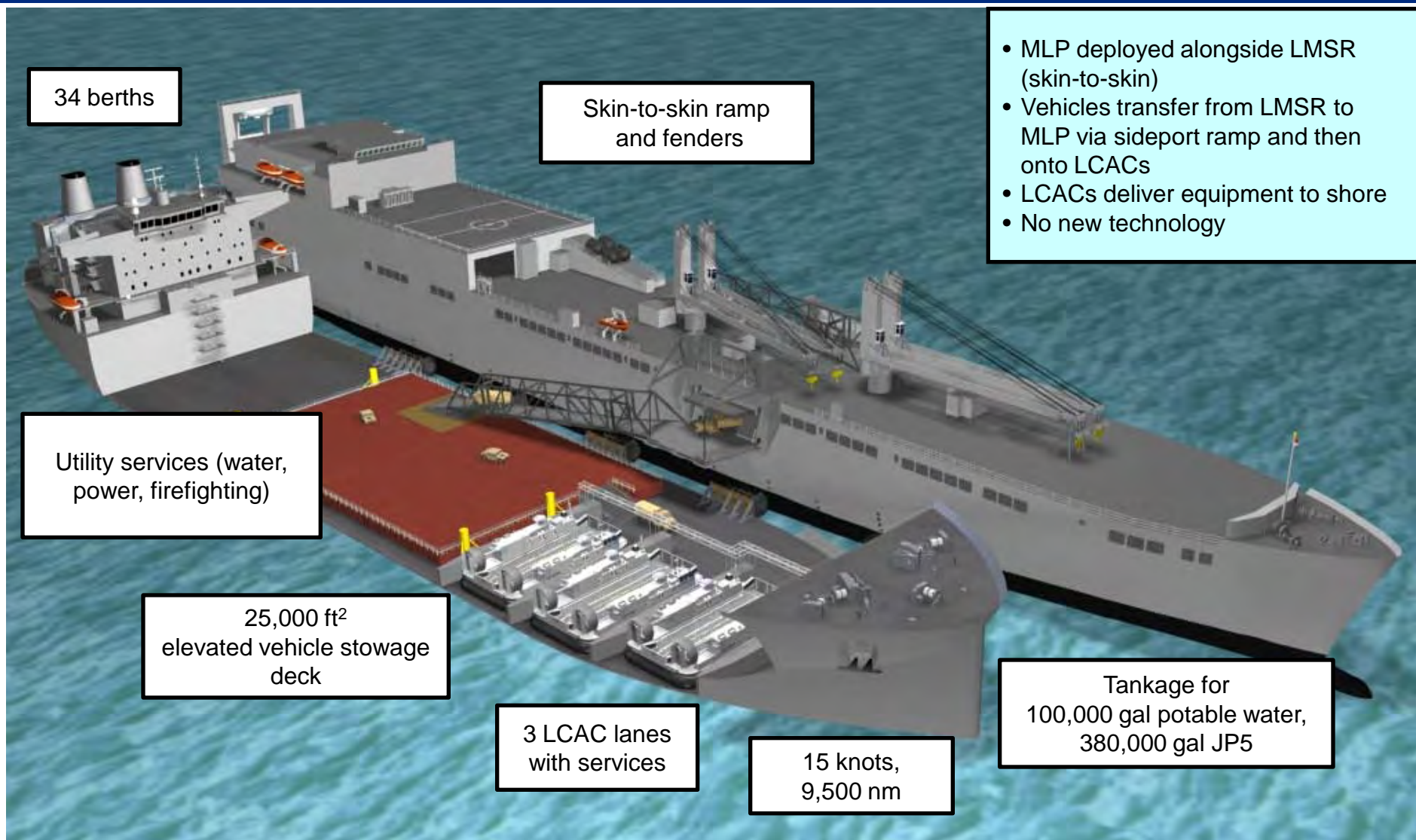
MEDICAL

24 m² (255 ft²) (Isolation only). BP tanker legacy facility

Information as of 10/19/2011



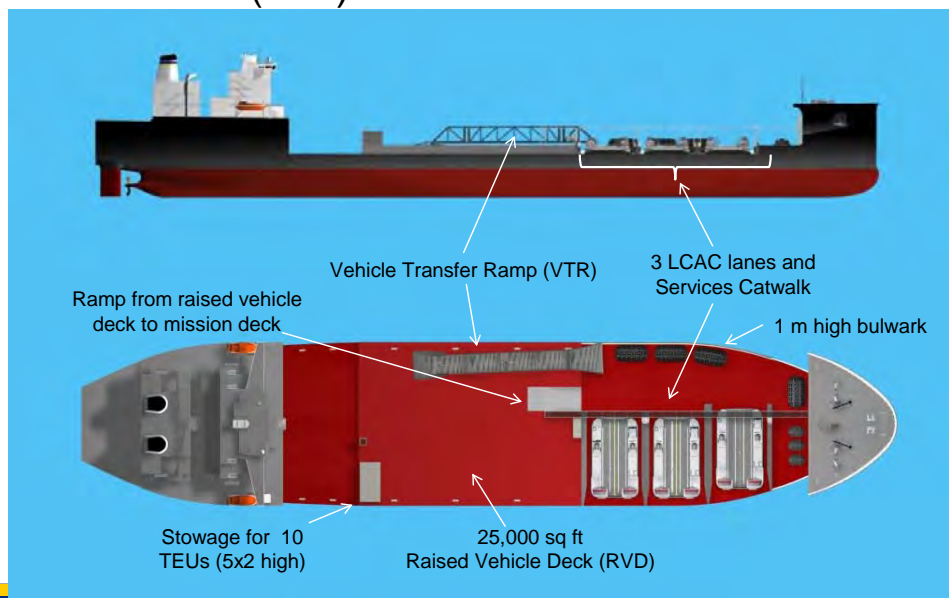
MLP Capabilities





Core Capability Set Acquisition Plan

- Government-led contract design effort to refine and translate the requirements into the design and specifications for the core capability set before competing the contract, which allows more user input.
- A separate competitive contract for Detail Design and Construction and integration of the core capability for MLP 1 with options for MLP 2 and MLP 3 will be issued.
- Core Capability Set includes: Elevated vehicle stowage deck, 3 LCAC lanes, LCAC services catwalk, Skin to Skin fenders, and support structures to receive LMSR side port ramp and fender to bear upon.
- Interfaces between the ship and core capability package are managed via an existing Interface Control Document (ICD).





MLP Production Progress



MLP Blocks
under
construction at
NASSCO





MLP Program Way Ahead



- **Core Capability Set RFP Release (1st QTR FY 12)**
- **MLP 1 Keel Laying (1st QTR FY 12)**
- **Award Core Capability Set (3rd Qtr FY 12)**
- **MLP 2 Start of Construction (3rd Qtr FY 12)**
- **MLP 1 Undock (1st Qtr FY 13)**

N851 USN NSW Branch

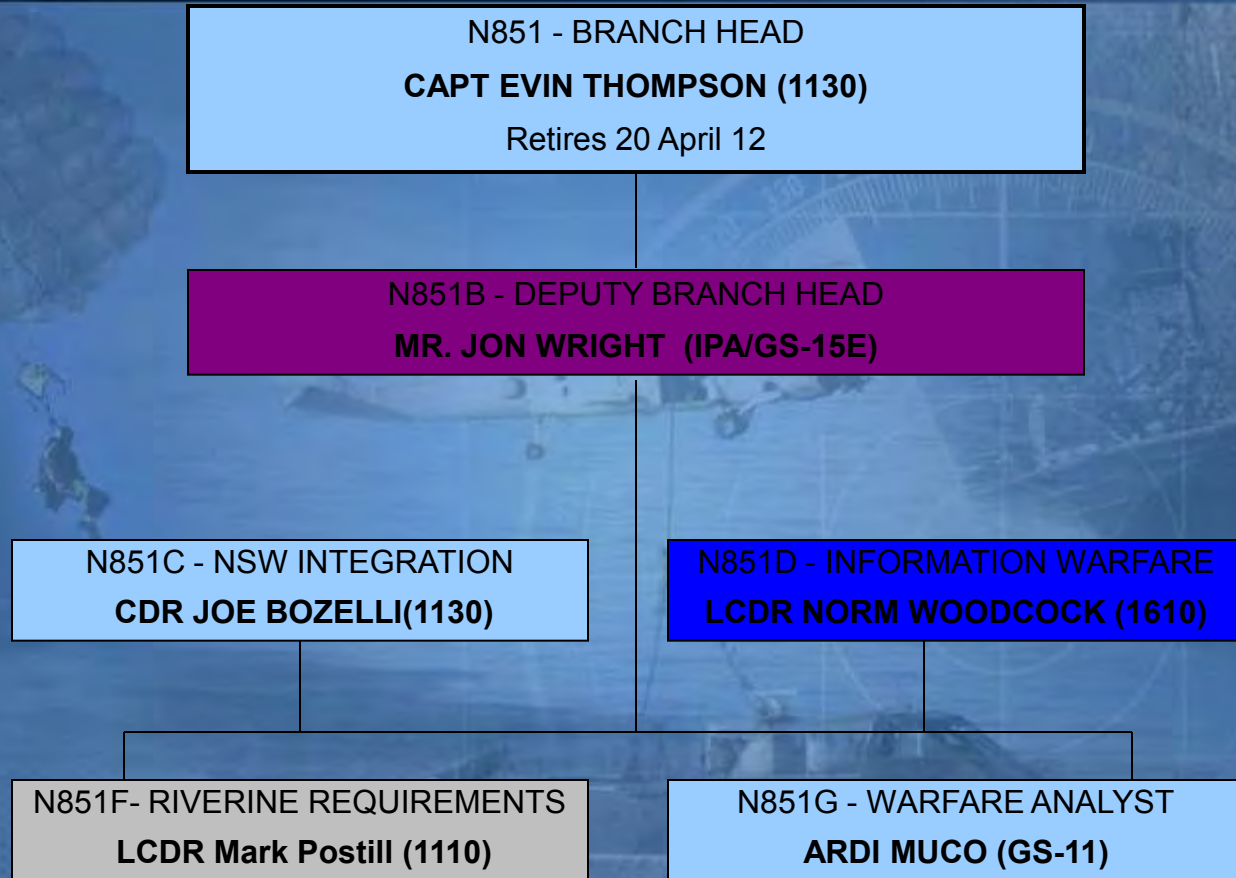
Brief to 16th NDIA Expeditionary Warfare Conference



Captain Evin Thompson

27 October 2011

N851 - Naval Special Warfare Branch



OPNAV
Billet/Position



NAVSPECWARCOM DET Wash.
Position



Temp. assignment based
on an N85B-N2C MOA

N851 – Primary Responsibilities

- **Resource sponsor for:**
 - Naval Special Warfare (NSW) service common requirements.
 - Navy Riverine Force.

- **Senior NSW advocate/advisor on the staff of the CNO.**
 - NSW Urgent Operational Need (UON)/SOF - related Joint Urgent Operational Need (JUON) advocate.
 - Advisor in support of N81 analyses and studies that include or support NSW/SOF equities.

- **OPNAV coordinator/advocate for Navy programs that support/involve NSW/ExW. Examples include:**
 - Scan Eagle Unmanned Aircraft System (in support of NSW and USCENTCOM).
 - Small Tactical Unmanned Aircraft System (STUAS).
 - Special Operations Force (SOF) support attributes of future Navy ships.
 - Navy policy for Premeditated Personnel Parachuting (P3) operations.
 - “Naval Solution for Visit, Board, Search and Seizure (VBSS).”
 - Common Seaframe for Navy/SOF

- **Represent Commander, NSW Command, as directed, in the National Capital Region.**

Naval Special Warfare

Sustained/Improved Service-Common Support

SCAN EAGLE UAS



LEGACY TACTICAL COMMS



LEGACY COMBATANT CRAFT



INLAND OPERATIONS



SMALL TACTICAL UAS



COMMON TACTICAL COMMS



COMMON COMBATANT CRAFT

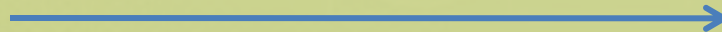


MARITIME/SFA OPERATIONS



- Capability Driven Recapitalization
- Support NSW movement towards SFA
- Ensure NSW compatibility with Fleet assets
- Exploit Navy-SOF system commonality
- Improve tactical ISR capabilities
- Improve Command & Control

OIF/OEF Centric



Post-OIF/OEF Engagement

N851 - Major Efforts

- **PB MK VI**
- **IW Enhancements to the SUW Package**
- **STUAS**
- **SE Sustainment and monitoring**
- **Precision Engagement Lethality**



N851 POC: CAPT Evin Thompson, 703-614-2107,



BACKUPS

N851 - Top Programs

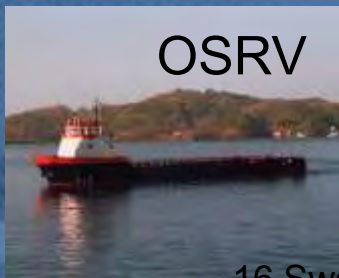
- Naval Special Warfare (NSW)
 - Provide procurement and sustainment resources for service common capabilities, to include:
 - Small Arms & Weapons Mounts
 - Tactical Communications Equipment
 - Night Vision Equipment
 - Training Support Craft
 - Operational Stocks
 - Planning & Management Support Systems
- Riverine Activities Program
 - Provide procurement resources for initial outfitting, capability improvements and phased replacement for Riverine Group ONE and component Riverine Squadrons ONE, TWO and THREE.
 - Achieve Full Operational Capability (FOC) by FY 2010 (with exceptions).
 - Support establishment of a “Fourth Riverine Squadron.”
- Unmanned Aircraft Systems (STUAS) for L-Class ships, NSW and NECC
 - Representing N85 equities (NSW, NECC and L-Class ships) in this N2N6 - resourced program.
 - Expeditionary Forces require STUAS Tier II vice STUAS – Lite.
- Procurement/sustainment of Scan Eagle Unmanned Aircraft Systems ISO SOF
 - Requested by NAVSPECWARCOM, via UONS, and USCENTCOM, via JUONS for OIF and OEF.
 - Capabilities provided by the JUON employed under custody of NAVSPECWARCOM.
 - N851 coordinates execution with NAVAIR program office, Task Force ISR, Naval Special Warfare Command, Special Operations Command Central and other involved/interested parties.

Expeditionary Basing

- LAND Basing
 - Expeditionary Camp
 - Force Protection
 - Civil Affairs
 - Medical
 - Expeditionary Logistics
- SEA Basing
 - High Speed Vessel
 - Landing Ship Dock (LSD)
 - Landing Platform Dock (LPD)
 - Littoral Combat Ship (LCS)
 - Utility Craft



Combatant craft on ships is not new!



16 Swedish RCBs landing in the LSD 41 class (USS TORTUGA) well deck

Unclassified

Lessons Learned (Representative)

- All sailors aren't prepared for „riverine“ duty.
- „You don't know what you don't know.“
- All small craft have payload limitations.
- Need for a robust (non-organic) intelligence collection/ analysis capability.
- Sustained awareness of „bum rate“ of major equipment, based on training usage, environmental factors, etc.
- Timing of personnel assignment with training cycle/deployment rotations.
- Sufficient time to incorporate counter-insurgency/foreign internal defense training into pre-deployment cycle.

Unclassified

USN Riverine Craft



Riverine Assault Boat (RAB)

Riverine Patrol Boat (RPB)



Riverine Command Boat (RCB)

Combat Rubber Raiding Craft (CRRC)



Fourth (Composite) Riverine Squadron (Alternative)

Composite
RIVRON
HQ

Offshore Patrol
Division
1 x RCB
2 x FP-C

Support Division
C2, VBSS, Medical,
Maintenance, etc

Inshore Patrol
Division
4 x LCS compatible
Patrol craft



Unclassified

LOA: 15m
(Actual)

LOA: 20m-22m
(Notional)

LOA: 11m-12m
(Notional)

Riverine Vehicles

MK 25 MTVR W/ MAS ARMOR KIT



UPARMORED HMMWV



CAT I



CAT II



MRAP (Mine Resistant Ambush Protected)

Weapons



M4



M9



M500



M2HB



GAU-17



MK19



M240G



MK21



MK48



UNCLASSIFIED



NAVAL SPECIAL WARFARE (N851)



Service Common Capabilities

- Pre-positioned operational stocks
- Visual Augmentation Systems
- Training support craft
- Small-arms and weapons mounts
- Tactical Communications Equipment

Irregular Warfare (IW)

- Developing Navy IW portfolio investment strategy
- Provide recommendations for Navy unique, risk-mitigating solutions to Joint IW efforts

Future Capabilities

- Integrate into future Navy capabilities and concept development of unmanned systems
- Provide expertise in development of future Special Warfare service common items



UNCLASSIFIED

NSW Scan Eagle UAS

Mission: Procured in response to NSW and Joint SOF Urgent Needs, the Scan Eagle UAS is provides Full-motion Video (FMV) intelligence, surveillance, reconnaissance, and targeting support to tactical users.

➤ Operational Employment:

- 9 Navy-owned systems
 - 6 x Operational, 2 x training, 1 x Op Spare
- Hub & Spoke Operations (300 hrs/month)
 - Spoke (Forward Control Station) ~100km

➤ Equipment:

- Scan Eagle UAS (12 air vehicles per site)
- Ground Control Stations, Launch/ Recovery, Pack-up & Maintenance kits, Ops/Maintenance Shelters

➤ Operational Overview

- IOC: Nov 08 (OIF), Aug 09 (OEF)
- OIF (as of 30 Sep 09):
 - Sorties: 346
 - Total Flight Hrs: 1847 hrs
- OEF (as of 30 Sep 09)
 - Sorties: 58
 - Total Flight Hrs: 450 hrs

➤ Rapid Development Deployment (RDD) – Special Payload Efforts



Performance		
Max Level Speed	70 knots	36 m/s
Cruise Speed	49 knots	25 m/s
Service Ceiling	16,400 ft	5000 m
Endurance	15 hours	15 hours
Dimensions		
Wing Span	10.2 ft	3.1 m
Fuselage Diameter	7.0 in	0.2 m
Length	3.9 ft	1.2 m

An exploded view diagram of the Scan Eagle UAS, showing its various components. Labels include: Wings, Winglets, Fuselage, Propulsion Unit, Nose, Turret, and Avionics. The diagram illustrates the aircraft's compact and modular design.

Scan Eagle UAS is an interim capability until fielding of STUAS Program of Record ~4Q FY13

Riverine Assault Boat (RAB)

Characteristics

Hull Type	High-grade Aluminum Rigid
Length	33 ft
Beam	9 ft
Draft	2 ft
Crew	7
Passengers	-
Twin Diesels w/Water Jets	Yes
Top Speed: full load	30 knots - cruise 40 knots - sprint
Range	250 nm
Fuel Capacity	250 gallons
C-130 Transportability	No
Combat Load	20, 500 lbs.
Bow Door/Ramp	No
Weapons Foundations	Multiple



Unclassified

Riverine Patrol Boat (RPB)

Characteristics

Characteristics	
Hull Type	High-grade Aluminum Rigid
Length	39 ft
Beam	10 ft – 2 in
Draft	2 ft
Crew	5
Passengers	8
Twin Diesels w/Water Jets	Yes
Top Speed: full load	35 knots - cruise 38 knots - sprint
Range	275 nm
Fuel Capacity	300 gallons
C-130 Transportability	No
Combat Load	22, 800 lbs.
Bow Door/Ramp	Yes
Weapons Foundations	Multiple



Unclassified

Riverine Command Boat (RCB)

Characteristics

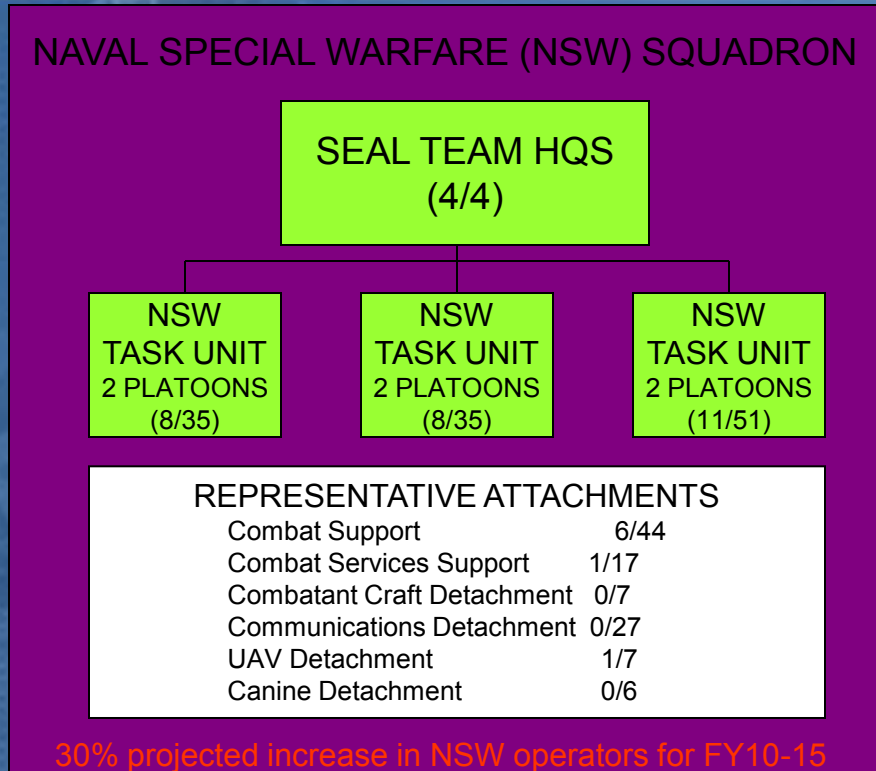
Hull Type	High-grade Aluminum Rigid
Length	49 ft
Beam	12 ft – 5 in
Draft	3 ft
Crew	4
Passengers	26
Twin Diesels w/Water Jets	Yes
Top Speed: full load	40 knots - cruise 45 knots - sprint
Range	>320 nm
Fuel Capacity	300 gallons
C-130 Transportability	No
Combat Load	40,000 lbs.
Bow Door/Ramp	Yes
Weapons Foundations	Multiple



Unclassified

Naval Special Warfare

Navy Service Common Support Rationale



Night Vision Equipment



Current Inv: ~47%

Req: 6500
Inv: 2900

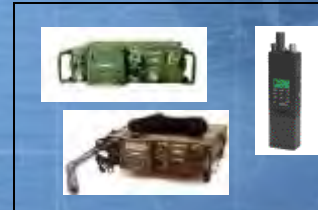
Operational Stocks



Current Inv: ~85%

Req: 5
Inv: 4.5

Comms/Electronics



Current Inv: ~25%

Req: 7200
Inv: 1760

Small Arm/Weapons Mounts



Current Inv: ~50%

Req: 8800
Inv: 4500

SERVICE COMMON GEAR AVAILABILITY

OBJECTIVE

PR11

POM10

PRE-POM10

Professional Development

- Language School
- Breacher
- Sniper
- HRST/DIVE SUP/RSO

Unit Level Training

- Land Warfare
- CQC
- MOUT
- MAROPS
- Mobility
- Combat Diving
- Air OPS

Squadron Integration Training

- SWCC, AIR, SEALs
- Full mock-up Combat training.
- Certification Exercises/Evaluations

Deployment

- Global presence

NSW Squadron Cycle (24 MOS)

\$345M Requested (POM10)

\$345M Approved (PR11)

N85 - Naval Special Warfare Relationship

- **United States Special Operations Command (USSOCOM) has service-like responsibilities to plan, program, budget and execute resources for Special Operations (SO) – peculiar support, services and equipment.**
- **Military Departments have support responsibilities to plan, program, budget and execute resources for service common capabilities for Special Operations Forces (SOF). Principal guidance is provided by:**
 - Title 10, United States Code, Sections 165, 167.
 - DOD Directive 5100.1; Functions of the Department of Defense and Its Major Components.
 - Memorandum of Agreement – Department of the Navy and USSOCOM.
- **N85 is OPNAV's principal advocate and resource sponsor for the Navy component of USSOCOM - Naval Special Warfare (NSW) Command.**
 - Other NSW (resource) sponsors on the OPNAV staff include:
 - N86 – Chem/Bio equipment, Small Tactical Unmanned Aircraft System (STUAS), SOF support attributes on future surface combatants.
 - N88 – Navy helicopter flight hours in support of NSW.
 - N87 – SOF support attributes onboard Navy submarines.
 - N6F – **Some** service common portable radios and electronics required by NSW (and NECC's Riverine component).
- **During each POM and PR cycle, N85 considers requests submitted by Commander, Naval Special Warfare Command for sustained and/or increased service common resourcing support.**

Naval Special Warfare

Capability Description

➤ Naval Special Warfare (NSW) forces conduct special operations in support of Joint Force and Navy commanders. Examples include, but aren't limited to:

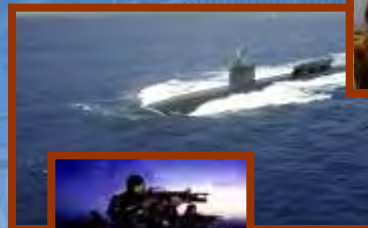
- *Direct Action*
- *Special Reconnaissance*
- *Foreign Internal Defense*
- *Counter-terrorist Operations*

➤ NSW Forces have been deployed to OEF since 2001 and OIF since 2003.

➤ Navy is responsible for providing resources to support NSW *service common* capabilities/sustainment.

➤ Categorization: Navy - only program (*SOCOM interest*)

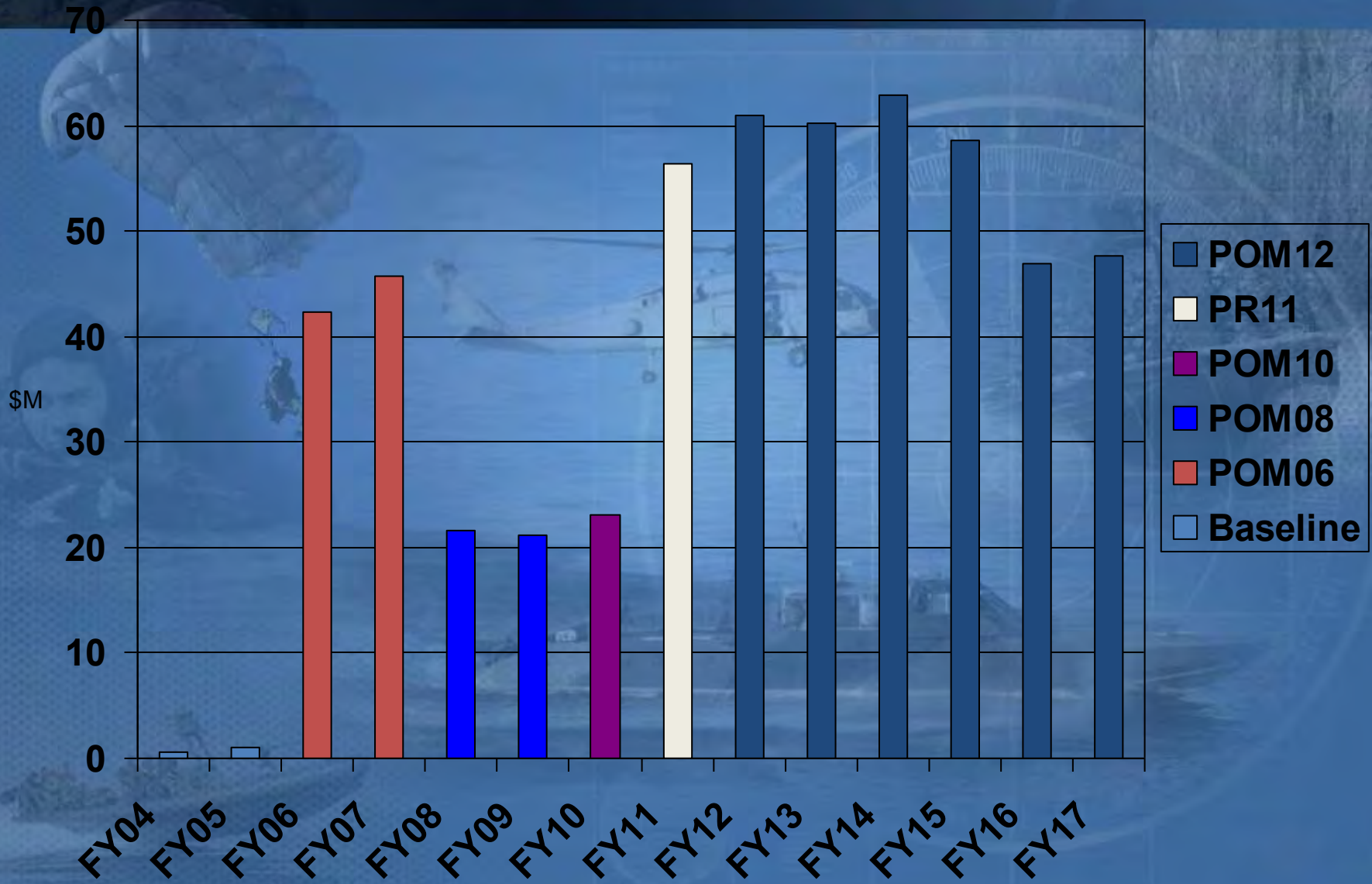
- *N85 - Principal resource sponsor; responsible for (most) NSW service common procurements/sustainment (OMN, OPN, WPN). [N6F was responsible for resourcing NSW service common portable radios (OPN); resources now in N85.]*
- *N86 - Responsible for resourcing NSW service common Chemical, Biological, Radiological Decontamination Equipment (CBRDE) and Small Tactical Unmanned Aircraft System (STUAS) capabilities (OMN, OPN, APN).*



USSOCOM - Resource sponsor for all *Special Operations peculiar* capabilities/sustainment, capability improvements and all NSW ammunition.

N85 RESOURCE SUPPORT TO NAVAL SPECIAL WARFARE

(Source: N851, as of March 2010)



Riverine Activities

Capability Description

- Operational Riverine Force components (Riverine Squadrons) are organized, trained and equipped to conduct maritime security operations and theater security cooperation missions along inland waterways. Examples include, but aren't limited to:
 - *Patrol*
 - *Interdiction/Visit, Board, Search, Seizure*
 - *Troop transport*
 - *Foreign Internal Defense*
- N851 has been managing initial outfitting resourcing of the Riverine component of NECC since late FY05.
- Riverine Squadrons have been deployed to OIF since March 2007.
- Categorization: Navy - only program
 - *N85 - Principal resource sponsor; responsible for procurement resources (OPN, WPN, PANMC, RD TEN)*
 - *N2N6 - Responsible for resourcing portable radios (OPN)*
 - *N43 - Responsible for resourcing readiness funding (OMN)*
 - *N86 - Responsible for resourcing CBRDE (OPN, OMN)*



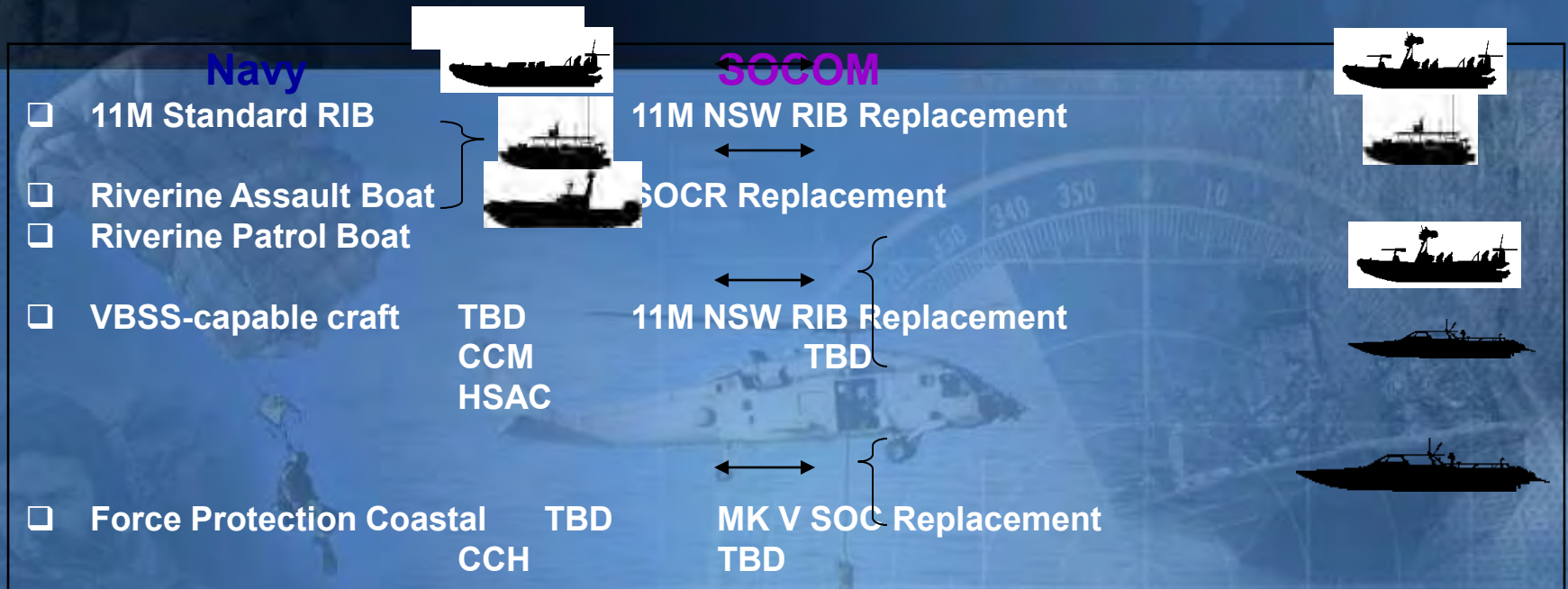
Riverine Force OIF Activities

<i>River/Lake Security Patrols</i>	923
<i>Quick Response Force missions</i>	100
<i>Riverine Convoy missions</i>	689
<i>Shoreline sweeps</i>	354
<i>Joint operations conducted</i>	240
<i>Iraq Security Force Patrols</i>	245
<i>Detainees screened</i>	389
<i>Boats impounded</i>	76
<i>Weapons caches found</i>	142
<i>Combined operations conducted</i>	156
<i>Unmanned aircraft hours flown</i>	667
<i>Aircraft control hours</i>	268
<i>Iraqi River Police trained</i>	217
<i>Partnership training (Mandays)</i>	3501
<i>Key Leader engagements</i>	165
<i>Allocations of micro grants (\$K)</i>	111



Unclassified

Future Navy - SOCOM Common Combatant Craft Possibilities



Current Navy - SOCOM Combatant Craft Commonalities

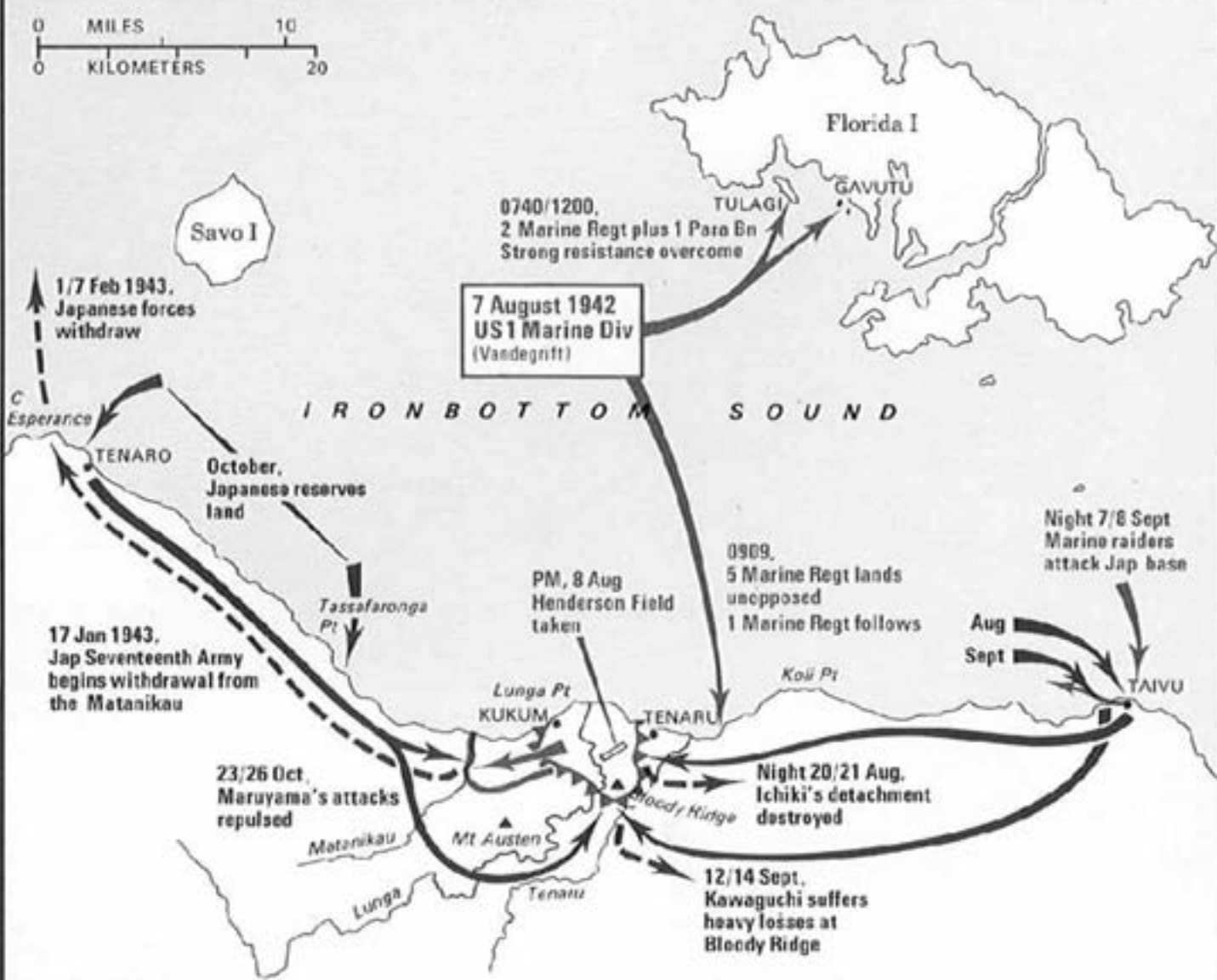
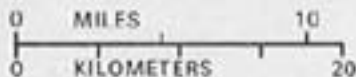
- ✓ Navy's Riverine Assault Boat and SOCOM's SOCR (they are the same craft)
- ✓ Small arms, weapons mounts and ammunition
- ✓ Tactical communications equipment
- ✓ On-board sensors (Electro Optic/InfraRed systems)
- ✓ Individual visual augmentation systems
- ✓ Chemical-Bio protective/decontamination equipment
- ✓ (Tier I) Unmanned Aircraft System (Puma All Environment Capable Vehicle)

What N851 Needs from Industry

- Lighter weight body armor
- Lighter weight modular/removable vehicle & boat armor
- Improved anti-corrosive coatings for weapons
- Batteries with higher power densities and lighter weight
- Tools to aid with concealment of people and equipment
- Portable translation devices and even better, ability to manage pools of vetted native speakers that can be tapped into
- (N2N6/CT Support) Data mining tools that can reach



Unclassified



- ← AMERICAN ATTACKS
- JAPANESE COUNTERATTACKS AND WITHDRAWALS
- ▲▲▲▲ US DEFENSE PERIMETER 9 AUGUST
- US POSITIONS 23 OCTOBER

EARLY DECEMBER, 1 MARINE DIV RELIEVED BY 25 INF, 2 MARINE AND AMERICAN DIVS (XIV CORPS [PATCH])



Increasing Combat Effectiveness

“Go Further, Stay Longer, Less Risk”



Expeditionary Warfare Conference

25 Oct 2011

Col Bob “Brutus” Charette

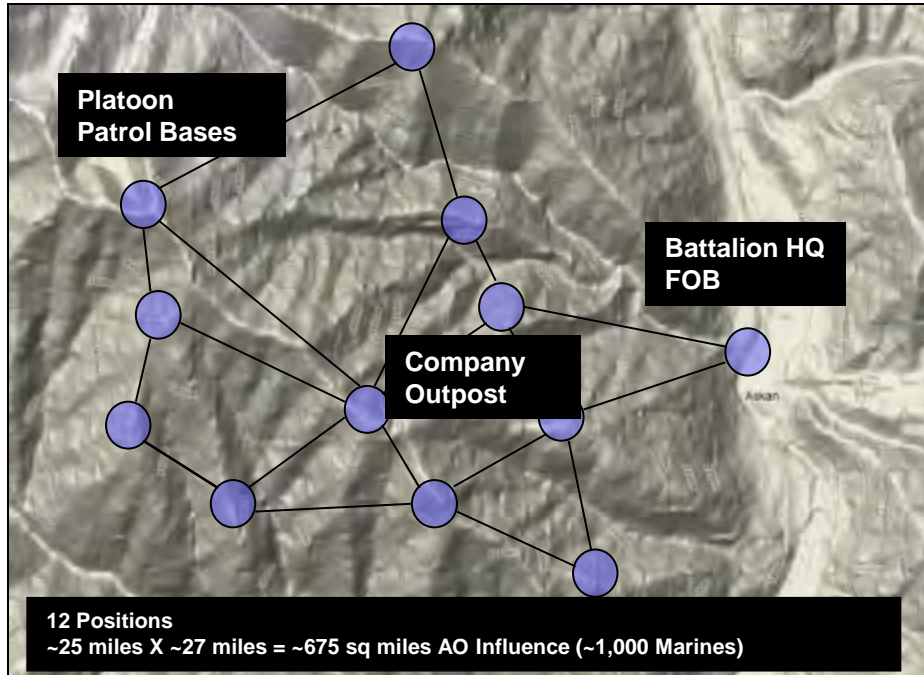
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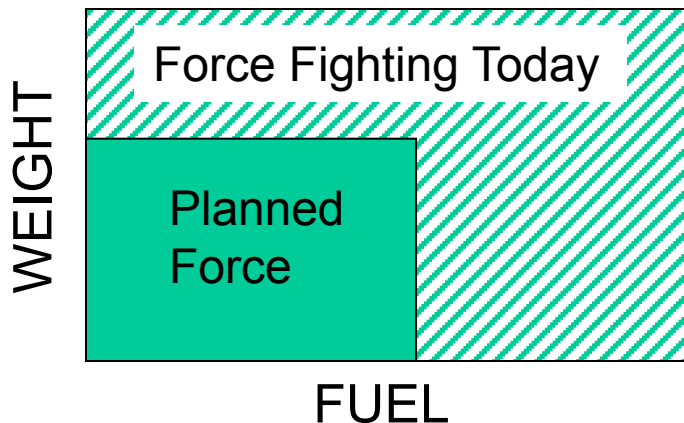


Distributed Operations

“Enabled By Technology Advances”



- 250% Increase in Radios
- 300% Increase in IT/Computers
- 200% Increase in # of Vehicles
- 75% Increase in Vehicle WGT
- 30% Decrease in MPG
 - MTRV – 4.3 MPG
 - HMMWV – 8.0 MPG
 - MRAP – 4.0 MPG



Increased Risk and Dependence



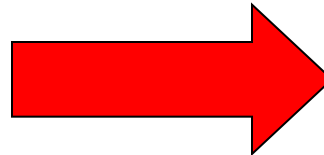
Lighten the Load, Don't Give up Lethality



**Batteries Alone:
380% Weight Increase
2,400% Cost Increase**



Vietnam



Today



Logistics Convoy Study

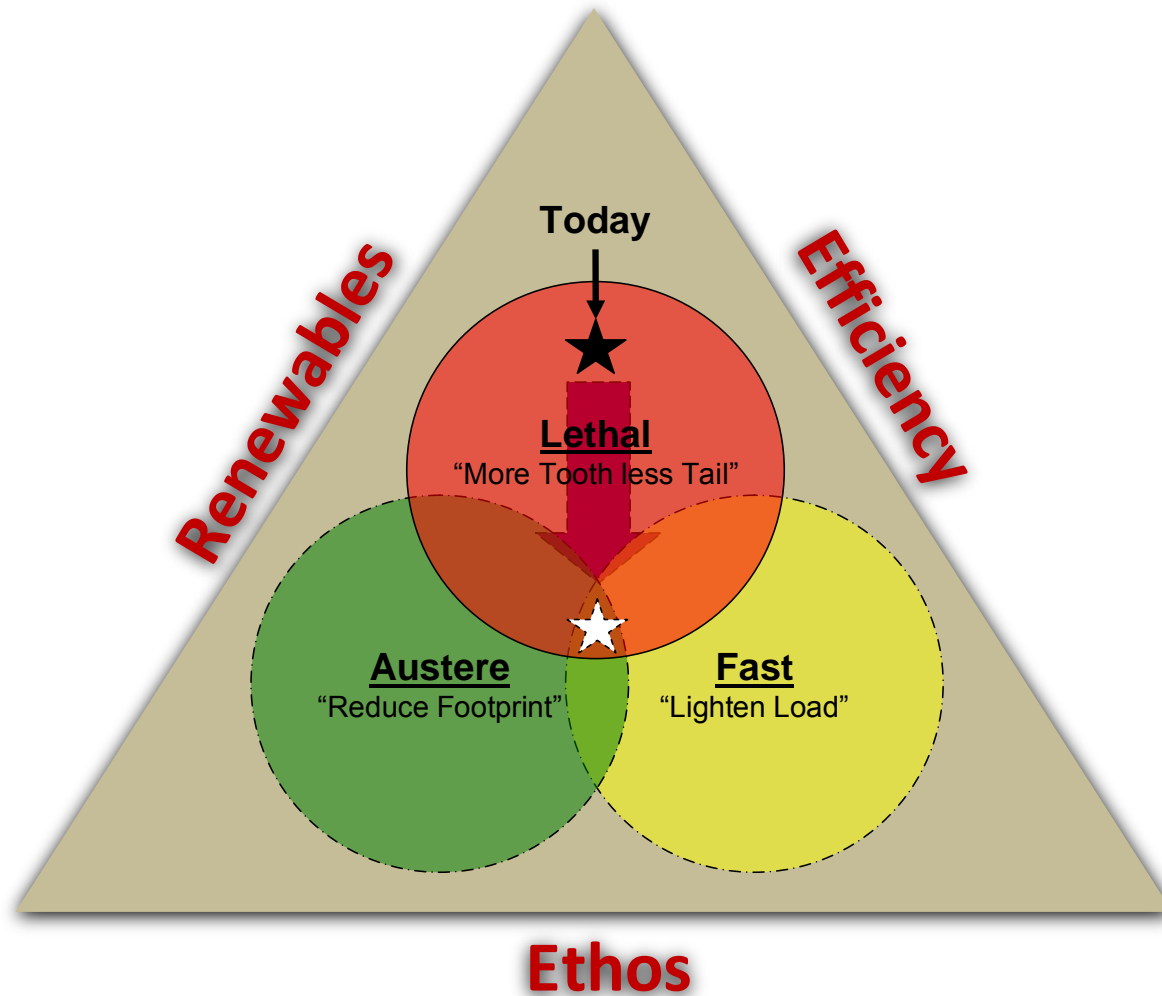
24 Mar 10 – 30 Jun 10



- 299 Fuel/Water Convoys (98 Days)
- **6 Marines WIA** hauling Fuel/Water
- **1 Marine WIA per 50 Fuel/Water Convoys**



Increasing Combat Effectiveness Reducing Risk





**Minimized Aviation
Resupply Missions**



**Self-Sufficient FARP –
Water & Energy
Alternative Fuel**



**Fuel, Battery, &
Water Resupply
Convoys
Minimized**



**Self-Sufficient COP/PB –
Renewable Energy
Powered
COC & Life Support,
Locally Sourced Water
Renewable Energy,
Water Purification**



**Joint or Coalition Force,
Interoperable Energy,
Water & Waste Capabilities**



Common Operational Energy Picture
Monitor, Analyze, Manage



**Afloat C2
& Logistics Support**



**Plan for Energy, Water,
& Waste Efficiency**



**Self-Sufficient Bn FOB –
Renewable Energy
Powered COC & Life
Support,
Locally Sourced Water
Minimum Footprint
Ashore**

**Dispersed
Maneuver Force**

**Improved, Fuel
Efficient Vehicles
Operating on
Alternative Fuels**



**Precision Air
Delivery**



**Dismounted Ops –
Reduced Battery &
Water Load &
Resupply
Renewable Energy,
Water Purification**



Strategic Framework

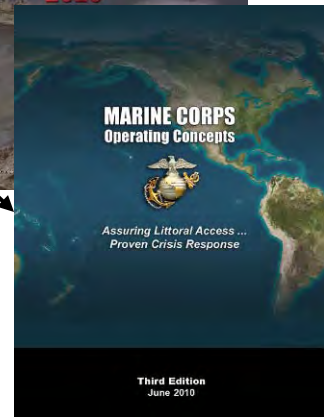


Mission

By 2025 we will deploy Marine Expeditionary Forces that can maneuver from the sea and sustain C4I and life support systems in place; the only liquid fuel needed will be for mobility systems which will be more energy efficient than systems are today.



E2W2 CBA/ICD

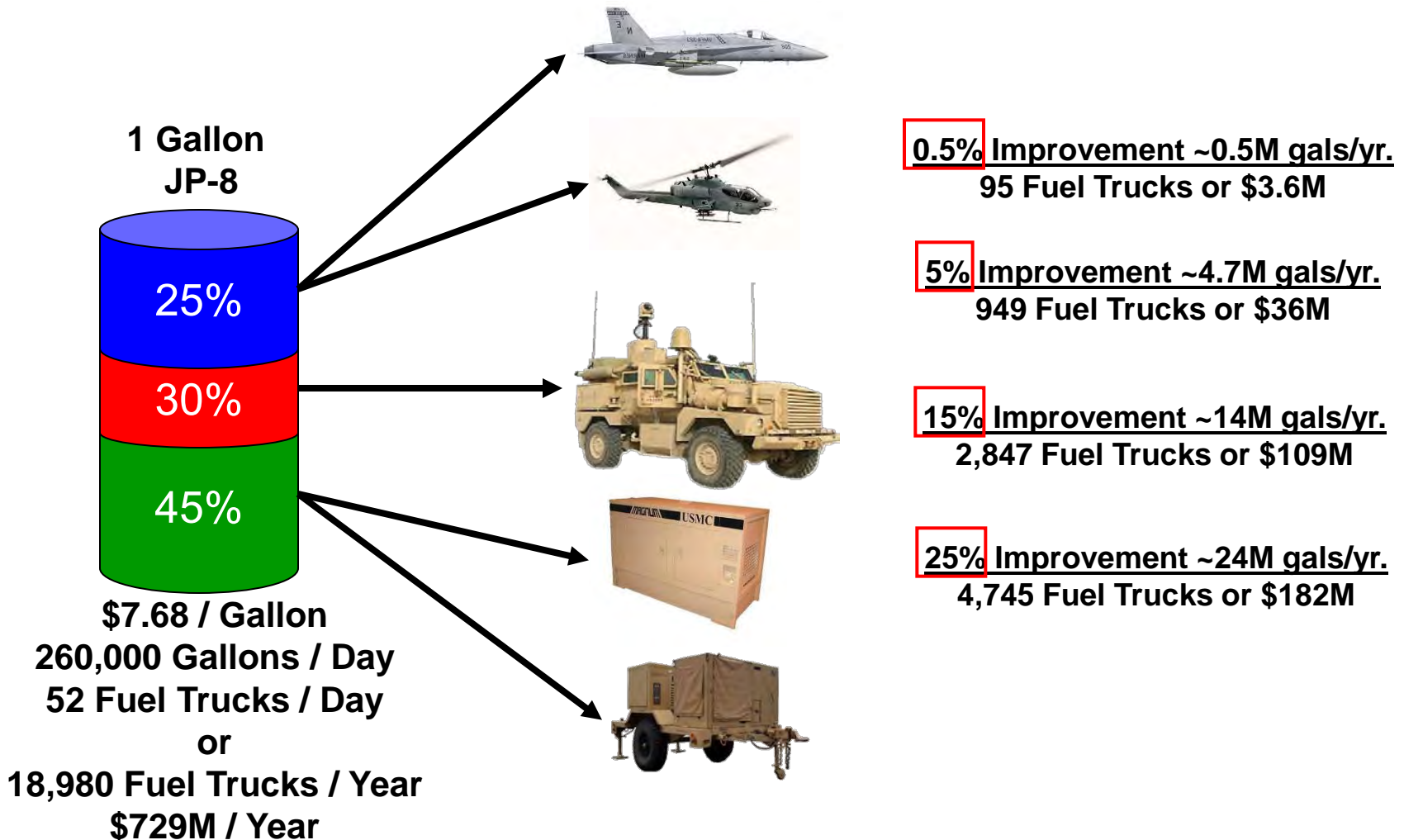


Three Pillars Required to Accomplish the Mission

Energy Strategy and Supporting Requirements Documents Written in Parallel to Achieve CMC's Priority; ...to "Implement New Capabilities..."



Today's Deployed MAGTF



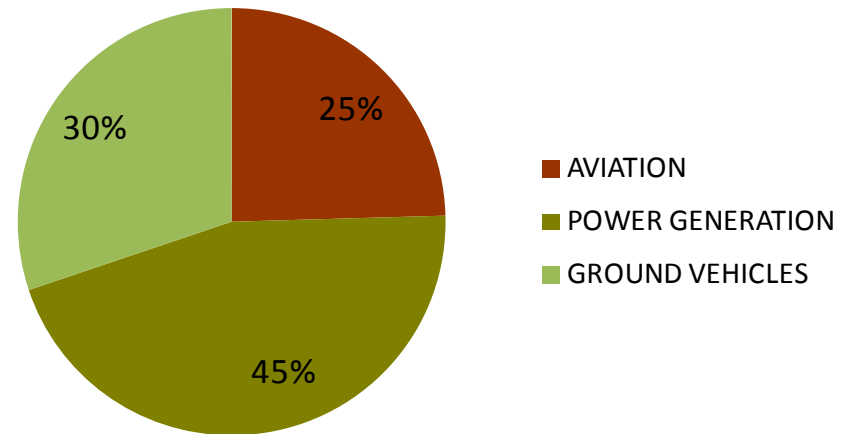
Small Improvements in Energy Efficiency...Big Impact!



Expeditionary Energy Goals “A Starting Point”



- 25% and
and Doctrine, Training, Organization,
Leadership = Behavior Change
“Expeditionary Ethos”
 - 10-15% Increased Efficiency of Ground
Vehicles and Equipment
 - 5-10% Renewable / Alternative Energy
 - 10% Increased Efficiency in Aviation
-
- ~50% Reduction by 2025



Starting Baseline
OEF 2010

(Will be adjusted as we gain greater insights
into actual use across the MAGTF)

Creating a more Capable MAGTF, Today and Tomorrow



ExFOB

“Capabilities-to-Combat-to-Programs”





ExFOB

“Capabilities-to-Combat-to-????”



Hybrid Power System

- **Greater Than 80% Fuel Savings**
- **Break Even Weight approx. 3 Months**
- **Break Even Fuel Cost approx. 1 Year**
- **Concerns : Complexity / Weight**

Direct Current Air Conditioner

- **Great Than 70% Fuel Savings**
- **Break Even Cost Immediately**
- **Concerns : Durability / Heating**









“We Are Looking For A Few Good Technologies”



- ***Temp Independent Electronics***
- ***Efficient Cooling / Heating of Personnel***
- ***Energy Storage***
- ***Energy Harvesting***
 - ***Solar***
 - ***Kinetic***
 - ***Thermal***
 - ***Waste***
 - ***Etc...***
- ***More Efficient Electronics / Vehicles / Equipment***
- ***Vehicles as a Power Source***
- ***New Leadership and Training***

We don't create markets, we protect our Nation!







KEARSARGE Amphibious Ready Group 26th Marine Expeditionary Unit Post Deployment Brief

Colonel Mark Desens
Commodore Pete Pagano

Overview



KSGARG & 26th MEU conducted missions across the full spectrum of operations from Humanitarian Assistance to Combat Operations




Task Organization



Supported/Supporting Command Relationship




 Amphibious Squadron Four
 PHIBRON 4
 Amphibious Ready Group
 (ARG)


 26th Marine Expeditionary Unit
 26th MEU




 USS KEARSARGE
 (LHD 3)




 USS CARTER HALL
 (LSD 50)




 USS PONCE
 (LPD 15)

CPR4/ARG Personnel:
 1,946 Sailors

26th MEU Personnel:
 2,892 Sailors and Marines

VMM 266 (REIN)
 (Aviation Combat Element)



Battalion Landing Team 3/8
 (Ground Combat Element)



1st Bn, 2nd Mar (-)(REIN)
 (Ground Combat Element)
 (Libya)



Combat Logistics Battalion 26
 (Logistics Combat Element)



Det, VMGR-252
 2 x KC-130J




 TACRON 21
 Det 1


 Fleet Surgical
 Team 6


 Naval Beach Group
 Det D

Pakistan Humanitarian Assistance



FORCE LAYDOWN

53 DET
CTH
PON
KSG

KSG: NATIONAL TASKING
CTH: MARITIME SECURITY OPS
PON: FHA/DR ALERT

- *Heavy flooding affected 14.5 million people, destroying more than 722,000 homes prompting early deployment*
- *Deployed 4 x CH-53E via Stratlift ISO Pakistan HA/DR*
- *Close coordination with PAK Mil, World Food Programme, and World Health Organization*
- *Predictive Analysis of flood waters by MEU S-2 influenced Ambassador and PAKMIL decisions*
- *Austere Conditions: No material handling equipment. Minimal hygiene and life support*



“If You Fly, You Work”

Duration of Mission	57 days
Total Supplies Delivered	3,159,786 lbs
Average Heat Index (Day/Night)	103 F

FLOOD EXTENT 03-10 SEP 2010
Produced 10 Sept 2010
SCALE: 1:1,000,000



“Any Clime and Place”

AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Theater Security Cooperation



EDGED MALLET: KENYA



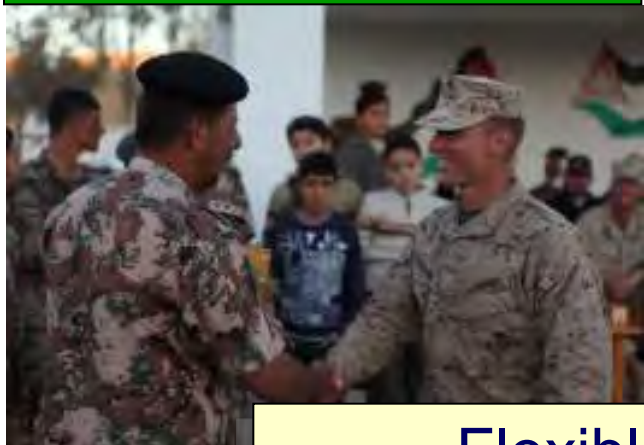
IRON MAGIC: UAE



RED REEF: SAUDI ARABIA



JODP: JORDAN



EASTERN SAILOR: QATAR

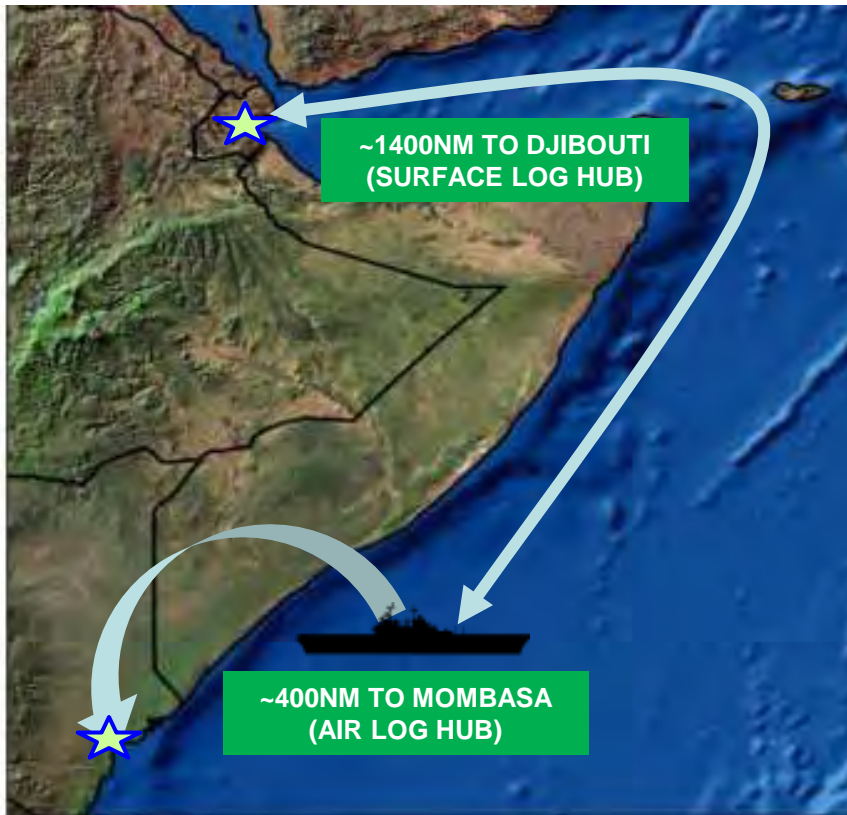


Flexible, Relevant, Made an Impact

AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY
			JODP	IRON MAGIC			EASTERN SAILOR		
			EDGED MALLET						



Djibouti as a Strategic Hub



Djibouti Provides:

- **Basing for ARG/MEU Enablers**
- **Critical Sustainment Training Venues**
- **Force Projection Node**
- **LCAC Beach Landing Site**

Strategic Investment Recommended

AUG

SEP

OCT

NOV

DEC

JAN

FEB

MAR

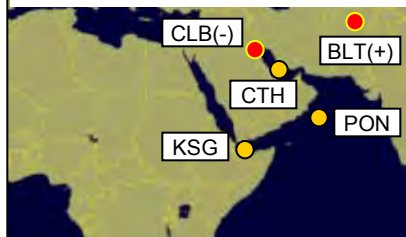
APR

MAY

Kuwait: Sustaining the Theater Reserve



FORCE LAYDOWN



KSG: LEB, EGYPT NEO ALERT
 CTH: INTEROPERABILITY TRNG
 PON: LEB, EGYPT NEO ALERT



- *Camp Buehring and Udairi Range*
- *Ali-al-Salem Air Base*
- *Washdown Facilities*

Only Base in CENTCOM for conduct of U.S. unilateral training

AUG

SEP

OCT

NOV

DEC

JAN

FEB

MAR

APR

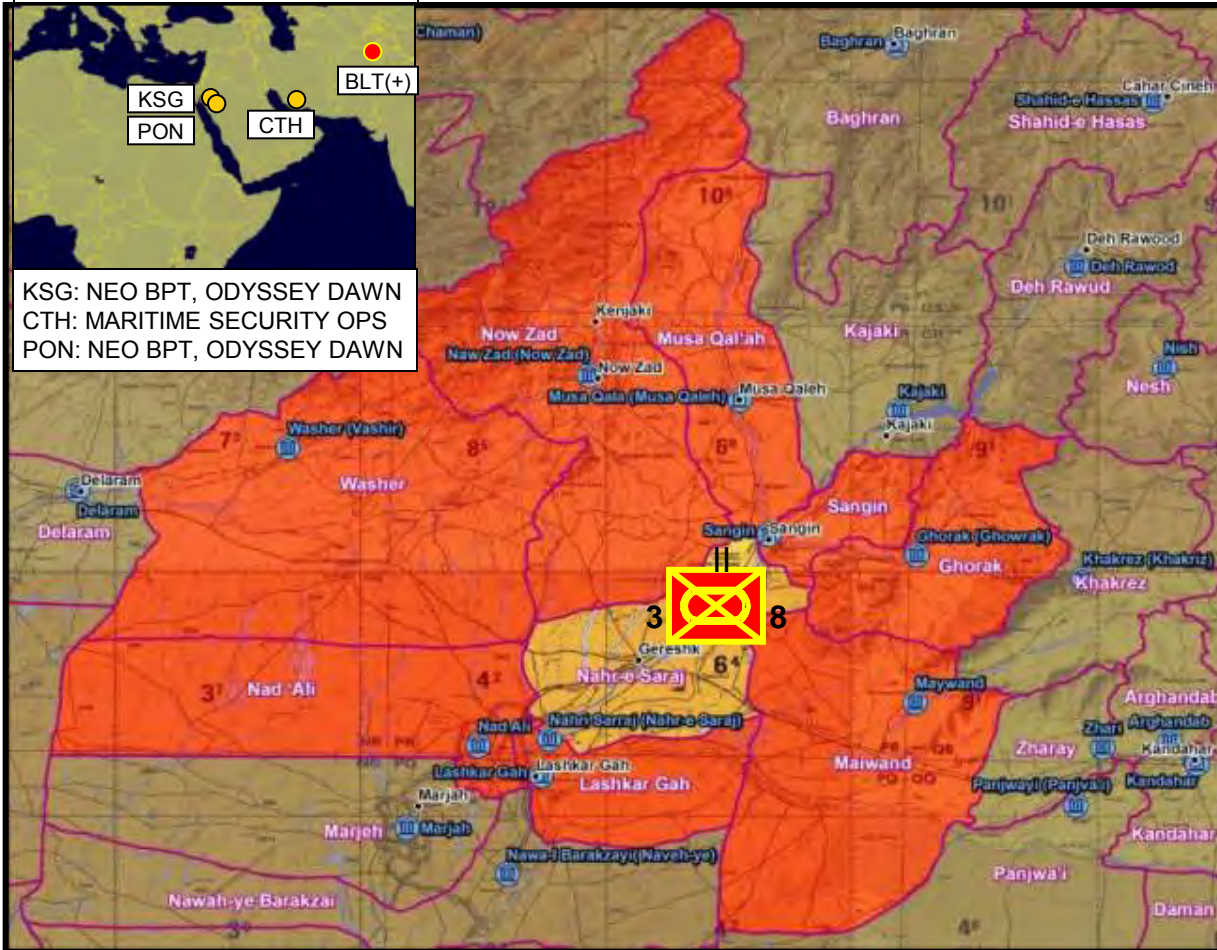
MAY



Afghanistan



FORCE LAYDOWN

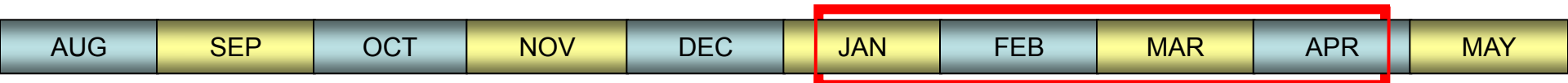


Purpose

- Deny enemy sanctuary
- Support Afghan Gov't build Rte 611
- Support Village Stability Operations

Key Takeaways

- MEU Main Effort
- Trained to OEF standards in PTP
- Relationship of BLT 3/8 with VMM-266
- Integration with MARSOC



Interoperability Training



USS CARTER HALL conducted an amphibious offload and then embarked 2 MH-60S Armed Helos for a Special Warfare training exercise

***2 x aircraft MH-60S detachment embarked on and operating from LSD for nearly 2 months:
No hangar? No problem!***



***Sea Base Connector
 CARTER HALL
 Offload accelerated
 by use of Army LSV***

AUG

SEP

OCT

NOV

DEC

JAN

FEB

MAR

APR

MAY

Operational Flexibility



FORCE LAYDOWN

KSG: NEO BPT, ODYSSEY DAWN
 CTH: MARITIME SECURITY OPS
 PON: NEO BPT, ODYSSEY DAWN

Situation Late February 2011

- *Regional Unrest*
 - *Lebanon Special Tribunal*
 - *“Arab Spring”*
 - *Tunisia*
 - *Egypt*
 - *Libya*
- *KEARSARGE and ENTERPRISE in Red Sea*
- *BLT 3/8(REIN) and 6 x MV-22B in Afghanistan*



ARG/MEUs - operating from land, sea, and air – provide tactical and operational flexibility to the Combatant Commander

**ENTERPRISE to OEF
 KEARSARGE to Libya**

AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY
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ODYSSEY DAWN & UNIFIED PROTECTOR



FORCE LAYDOWN



KSG: ODYSSEY DAWN
 CTH: MARITIME SECURITY OPS
 PON: ODYSSEY DAWN

JFACC HQ

AVIANO,
 ITALY

- ★ *USS KEARSARGE supported four embarked staffs*
- ★ *TACRON 21 provided 24/7 Tactical Air Command and Control*
- ★ *Joint Intelligence Center provided JOA-wide support*
- ★ *Coalition Integration*

AV-8B Targets Destroyed:

- 35 T-72s
- 25 APCs
- 4 HET Vehicles
- 2 SP Arty
- 2 MRL
- 1 SCUD

***Big Deck Amphibs & STOVL Strike
 Rapid Response...Immediate effects***

AUG

SEP

OCT

NOV

DEC

JAN

FEB

MAR

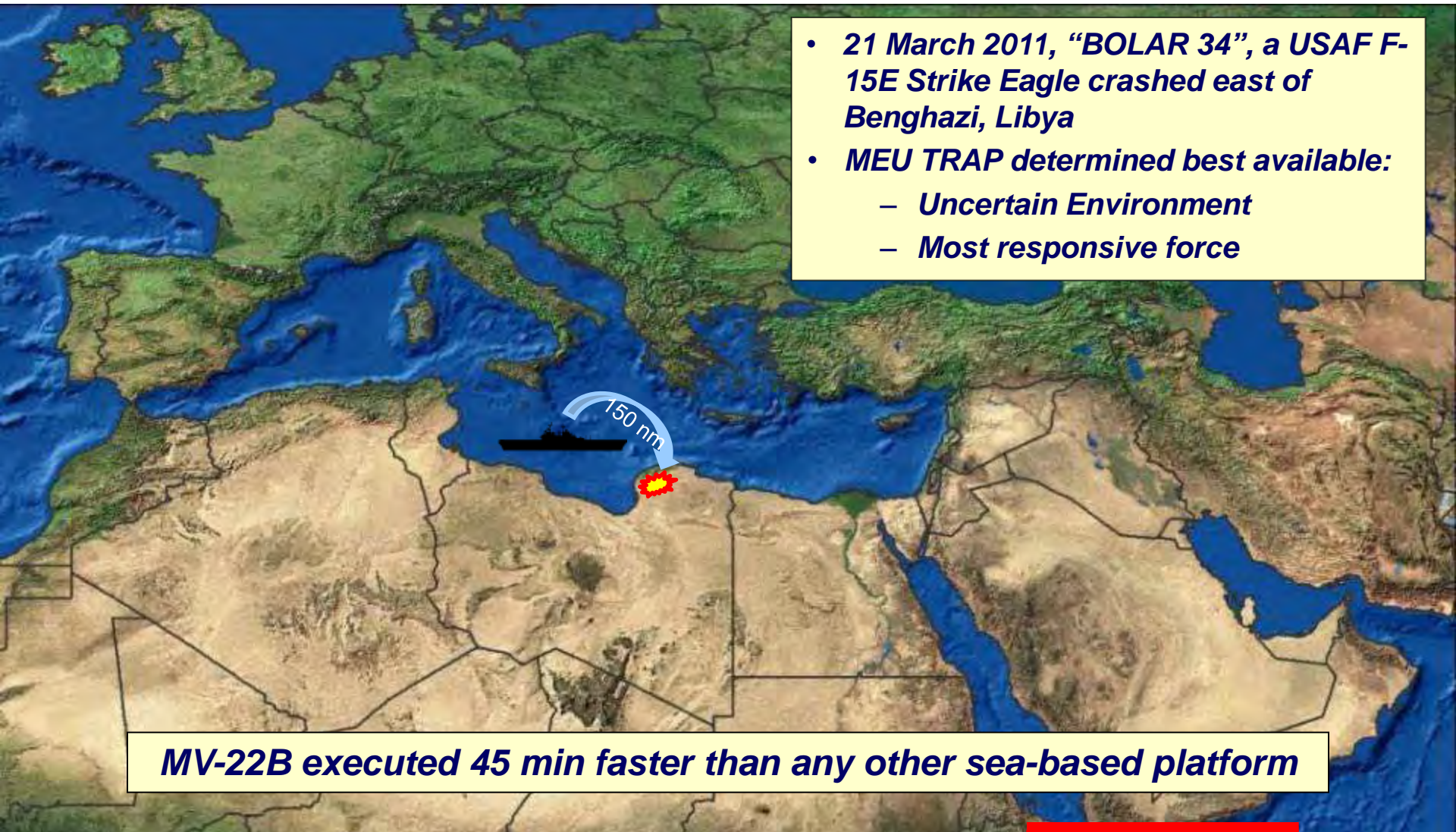
APR

MAY

“BOLAR 34” TRAP



- 21 March 2011, “BOLAR 34”, a USAF F-15E Strike Eagle crashed east of Benghazi, Libya
- MEU TRAP determined best available:
 - Uncertain Environment
 - Most responsive force



MV-22B executed 45 min faster than any other sea-based platform

AUG

SEP

OCT

NOV

DEC

JAN

FEB

MAR

APR

MAY



Recommendations

- ***Invest in Amphibious Forces***
 - *Improve Disaggregated Capabilities*
- ***Advocate for Big Deck Amphibs and STOVL aviation***
 - *Seabasing provides flexible forward deployed capabilities across the spectrum of military operations*
- ***Strategic Investment in Djibouti***
- ***Sustain Relevance / Access to Kuwait***



NDIA Expeditionary Warfare Conference



25 October 2011

Remarks of

Mr. Brian R. Detter

Deputy Assistant Secretary of the Navy
Expeditionary Programs and Logistics Management





FY11 DON Acquisition Highlights



- ACV development
- G/ATOR transition to ACAT1
- CAC2S
- ERP @ NAVSEA & NAVSUP
- F/A-18 MYP
- CANES Award
- JSF & P-8A @ Pax
- **MH-60 MYP**
- **V-22 100K hours**
- **FIRESOULT Deployments**
- UCAS-D First Flight
- COSC Award
- AEGIS Wholeness/Ashore
- **SM-6 OT**
- EMALS First Launch
- **Long-Range Land Attack Projectile (LRLAP) DT**
- **PEO LCS**
- Link 16/CEC Racetrack
- **HARVEST HAWK**
- **AH-1Z IOC/1st Deploy**
- **STOVL JSF Landing on USS WASP**
- 500th Tomahawk Flt Test
- DDG 113 Award
- DDG 114-116 Award
- **SSC Competitive RFP**
- **LPD 26 Award**
- **DDG 1001/1002 Award**
- **LCS Dual Block-Buy Award**
- **MLP – 1, 2 Award**
- **CVN -79 Adv.**
- **T-AKE 13, 14 Award**
- **JHSV-4-7 Award**
- CVN-71 RCOH
- 6 ships Christened
 - **2 x LPD, LCS, JHSV**
- 5 ships Delivered
 - **2 x T-AKE**
- 4 ships Commissioned

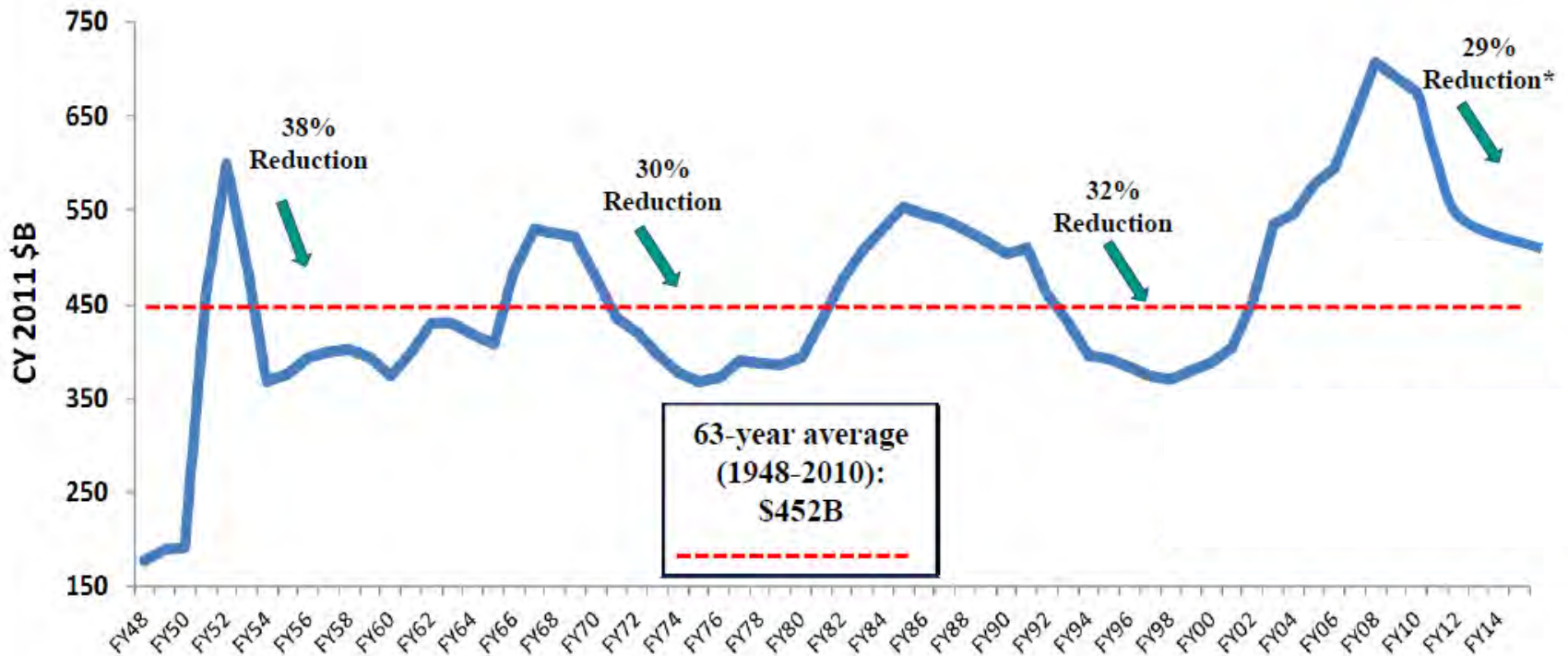
- SECNAV Key Enablers**

 - CVNs and Naval TACAIR
 - NIFC-CA
 - Navy BMD
 - SSNs/SSGNs
 - NSW and Marine force recon
 - LCS
 - Mine Warfare
 - DDG-1000s
 - NECC
 - Amphibious ships
 - V-22
 - Family of STS connectors
 - MPF
 - JLOTS
 - JHSV
 - Unmanned systems
 - Counter G-RAMM

Supporting SECNAV Expeditionary Warfare Key Enablers



We have been here before



Source: 2011 President's Budget Historical Tables

History suggests a downturn is inevitable



Challenging Future Environment



- National Situation
 - Economy
 - Unemployment
 - Debt
 - Budget Control Act of 2011
- DON Situation
 - Top Line Coming Down
 - Inflation
 - Cost of People
 - Cost to Operate
 - Cost of Acquisitions
- Industry
 - Restructure of Key Businesses
 - Layoffs
 - Loss of Defense Sector Jobs



“This hole is real deceptive. It’s wide and straight and not much of a challenge -- until you get up near that pack of pit bulls.”



DASN ELM Responsibility



- Principal advisor to ASN RDA for:
 - Expeditionary Programs
 - Urgent Needs
 - Logistics Management
- Advocate/support programs on behalf of
 - MCSC, JPEO MRAP, PEO LS, NAVSEA, NAVFAC
 - ONR, MCWL, SYSCOMS
 - NAVSUP/LOGCOM, SYSCOMS



DASN ELM Portfolio

Expeditionary Programs

ACV, MPC, Ground Vehicles, Counter IED, Weapons, Armor, Artillery, C2, Biometrics, Others



G/ATOR



MRAP FOVs



JLTV



MTVR



CREW/J-CREW



Marine Mammals



LW-155



CAC2S



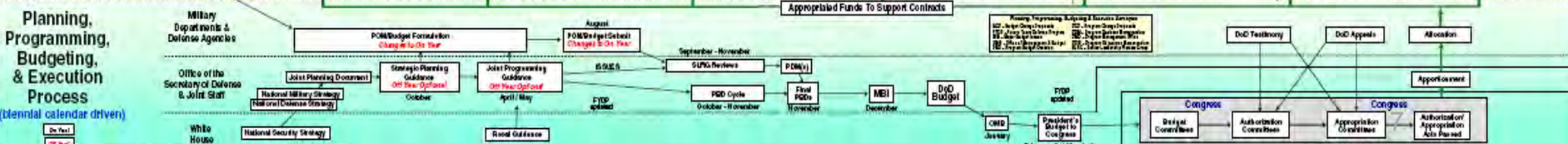
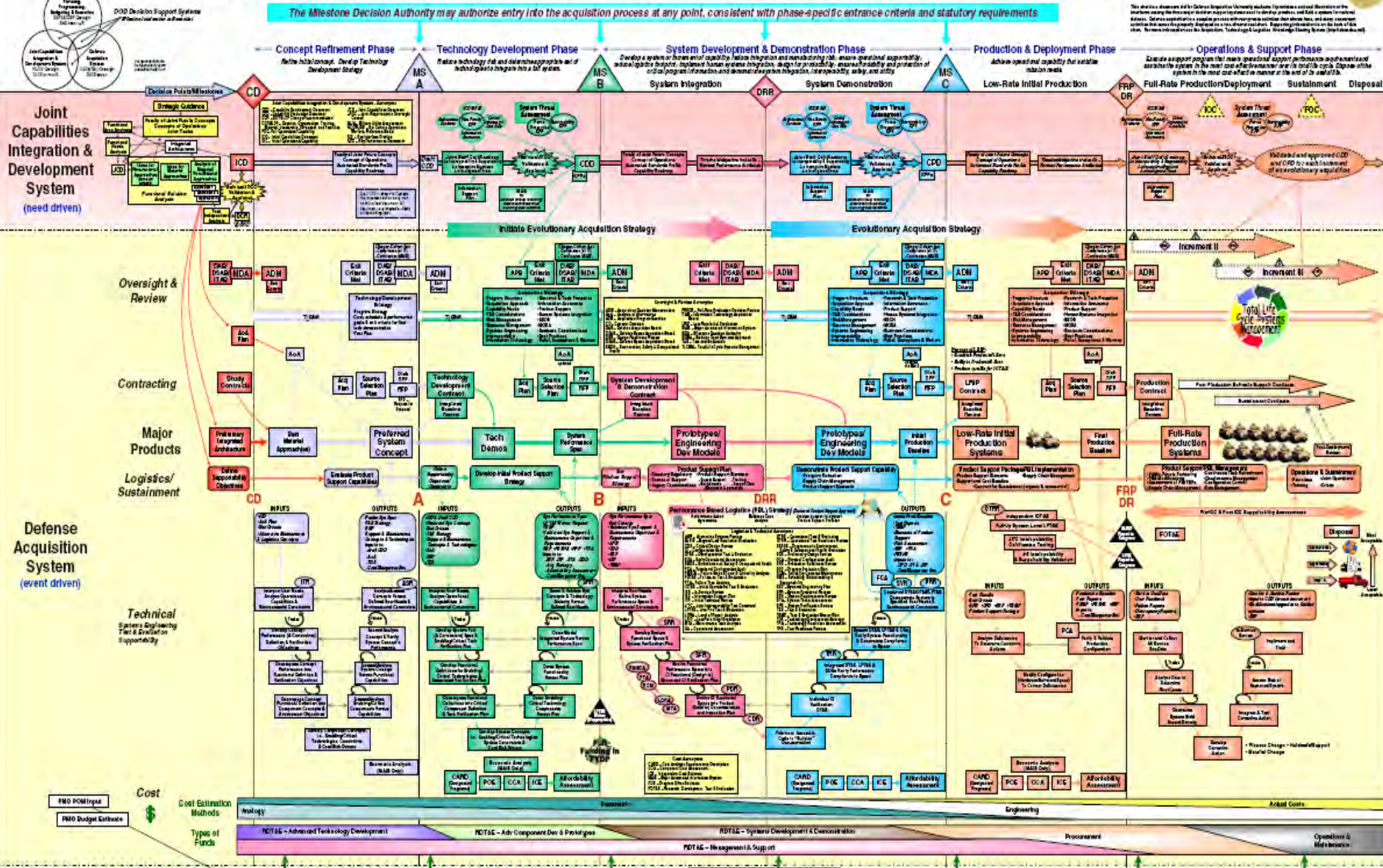
Small Arms



Integrated Defense Acquisition, Technology, & Logistics Life Cycle Management Framework

The Milestone Decision Authority may authorize entry into the acquisition process at any point, consistent with phase-specific entrance criteria and statutory requirements

The activities described in Defense Acquisition University include 17 program and 8 systems of the information using the process and/or support performance and/or operational and/or maintenance data. Some are additional to the process performance and/or operational and/or maintenance data. Some are additional to the process performance and/or operational and/or maintenance data. Some are additional to the process performance and/or operational and/or maintenance data.





Urgent Needs



- Providing capabilities to the warfighter
 - Timely responsiveness to needs
 - Abbreviates requirement to deliver capabilities
 - Beyond what is feasible within the standard acq process
- Focal point for DON Urgent Needs
 - Ensuring appropriate levels of insight and controls
- Solution development to capability delivery
 - Ensuring the right solution to the need





Where acquisition needs to go



Change the cost equation

Requirements stability

Make competition a priority

Speed to Fleet

Train our workforce



Questions?



Brian Detter

703-614-4794

NDIA 16th Annual Expeditionary Warfare Conference



Captain Dietrich Kuhlmann

United States Navy

Director, Operations Division ASN (FM&C)

Where We Are Going

- **Context**
- **Outlook**
- **Options**

Sailing Directions



Enduring responsibilities ...

- Remain ready to meet current challenges, today
- Build a relevant and capable future force
- Take care of our Sailors, Navy Civilians and their Families

Tenants

- Warfighting First
- Operate Forward
- Be Ready

CNO Guiding Principles

The starting point for developing and executing our plans

..Our **primary mission is warfighting**. All our efforts to improve capabilities, develop people, and structure our organizations should be grounded in this fundamental responsibility.

..People are the Navy's foundation. We have a professional and **moral obligation to uphold a covenant** with Sailors, Civilians and their families – to **ably lead, equip, train and motivate**.

..Our approach should be **Joint and combined** when possible. However, **we own the sea, and** must also be able to **operate independently** when necessary.

..Our primary Joint partner is the **U.S. Marine Corps**. We must continue to **evolve how we will operate and fight as expeditionary warfare partners**.

..At sea and ashore, **we must be ready to part with Navy roles, programs and** traditions if they are not integral to our future vision or a core element of our mission.

..We must ensure today's **force is ready for its assigned missions**. Maintaining ships and aircraft to their expected service lives is an essential contribution to fleet capacity.

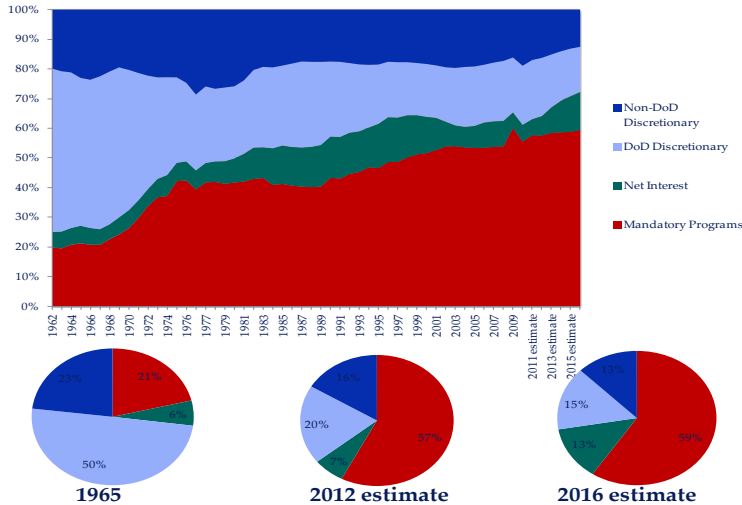
..Our **Navy Ethos defines us** and describes the standard for character and behavior.

..We must clearly and directly **communicate our intent and expectations** both within and outside the Navy.

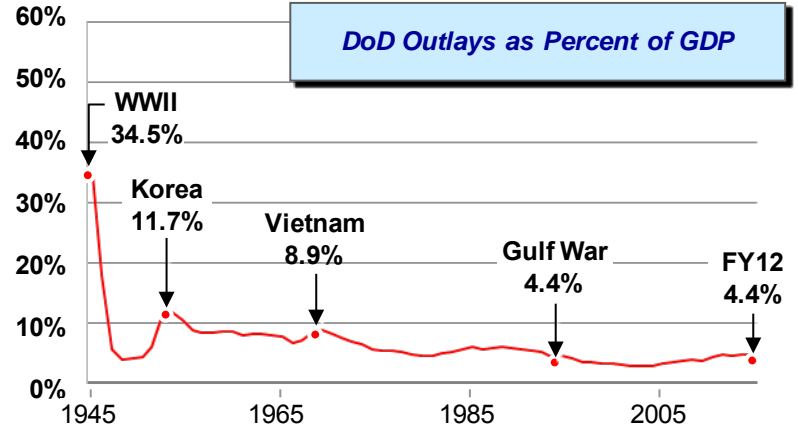
..I believe in the **"Charge of Command."** We will train and empower our leaders with authorities commensurate with their responsibilities.

U.S. Fiscal Pressures

Federal Spending

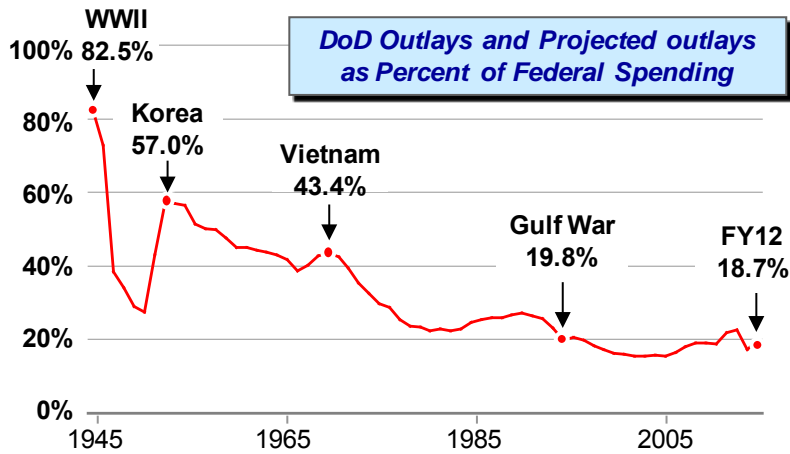


Defense as a Percentage of GDP



Source: Historical Tables, FY2011 Budget of the U.S. Government,

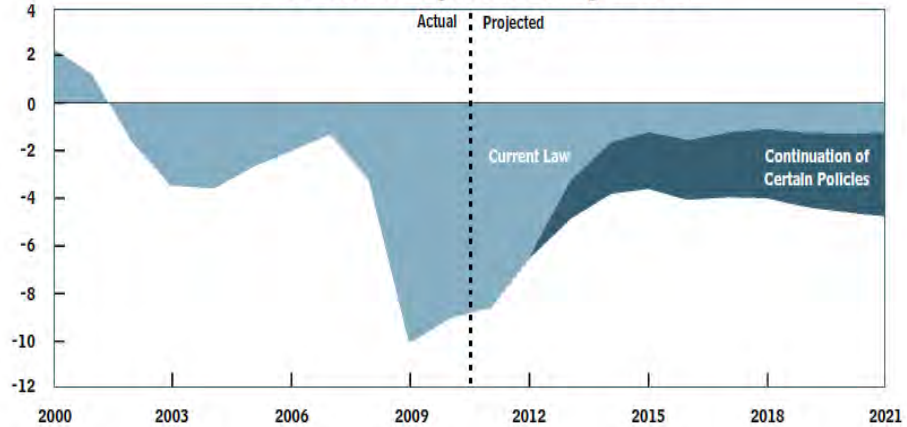
Defense as a Percentage of Federal Spending



Source: Historical Tables, FY2011 Budget of the U.S. Government

Federal Deficit/Surplus

Total Deficits or Surpluses (Percentage of GDP)



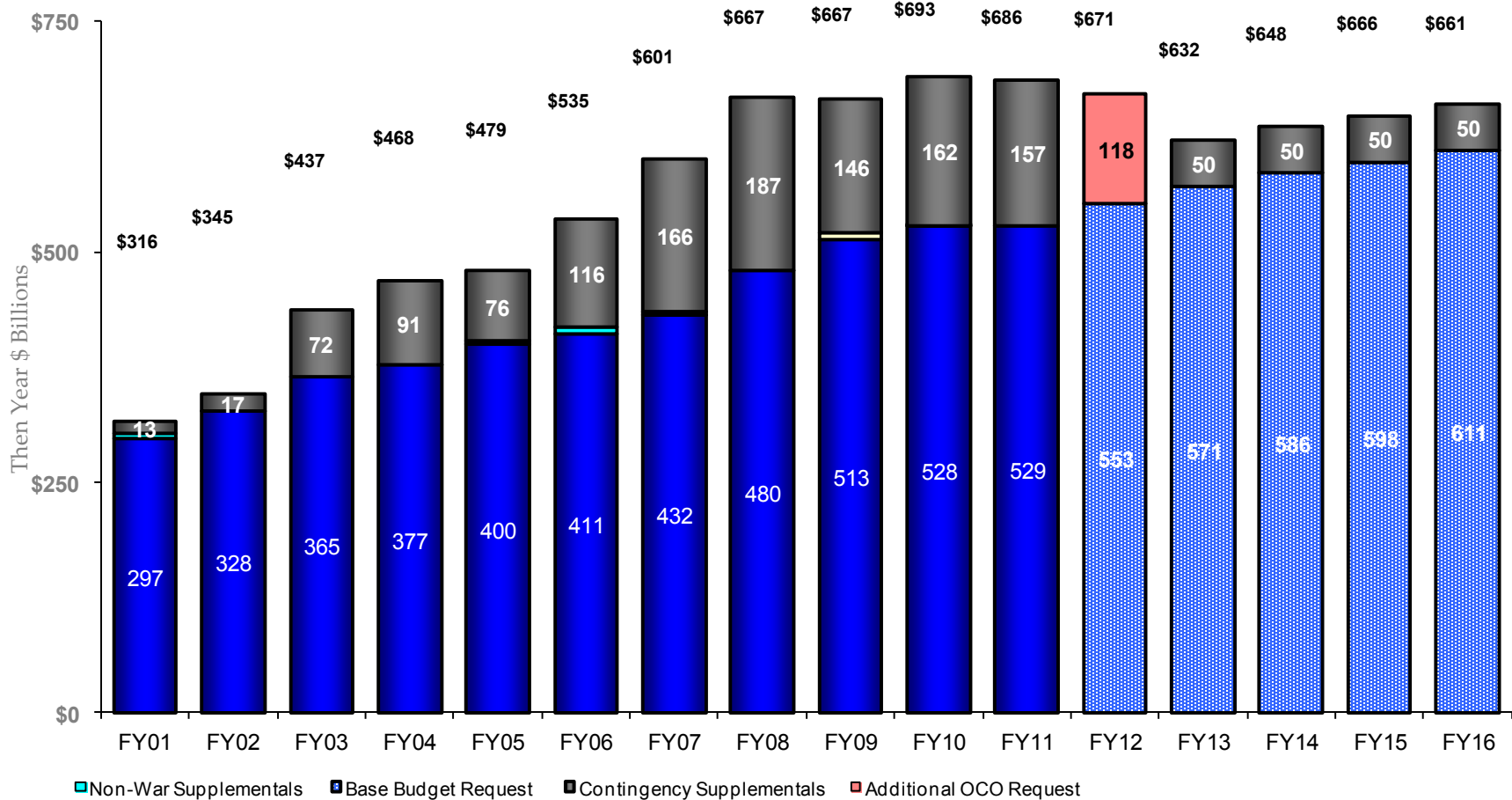
Source: Congressional Budget Office

Note: Economic forecast as of August 2011 to reflect the policy changes enacted in the Budget Control Act of 2011

Mounting deficits, interest payments & entitlement spending will result in downward pressure to defense budgets

PB12 Defense Spending Outlook

FY 2010 - FY 2015 Base Growth	
Nominal Growth	2.5%
Real Growth	0.5%



*Data is discretionary budget authority. FY01 through FY10 are actual levels. FY 11 is appropriated amount. FY 12 is budget request.
 *Data is from OSD FY12 Green book and H.R. 1473 Full year CR with DoD appropriations

Current DoD Fiscal Environment

The Budget Control Act 2011

-2 August 2011-

- Establish caps on discretionary funding through 2021 and proposes further reductions to at least \$1.5T in budgetary savings over next 10 years

OMB FY13 Budget Guidance

-18 August 2011-

- Prepare FY2013 Budgets under two options:
 - 5% below the FY2011 enacted level and
 - 10% below the FY2011 enacted level



Services

4th Estate



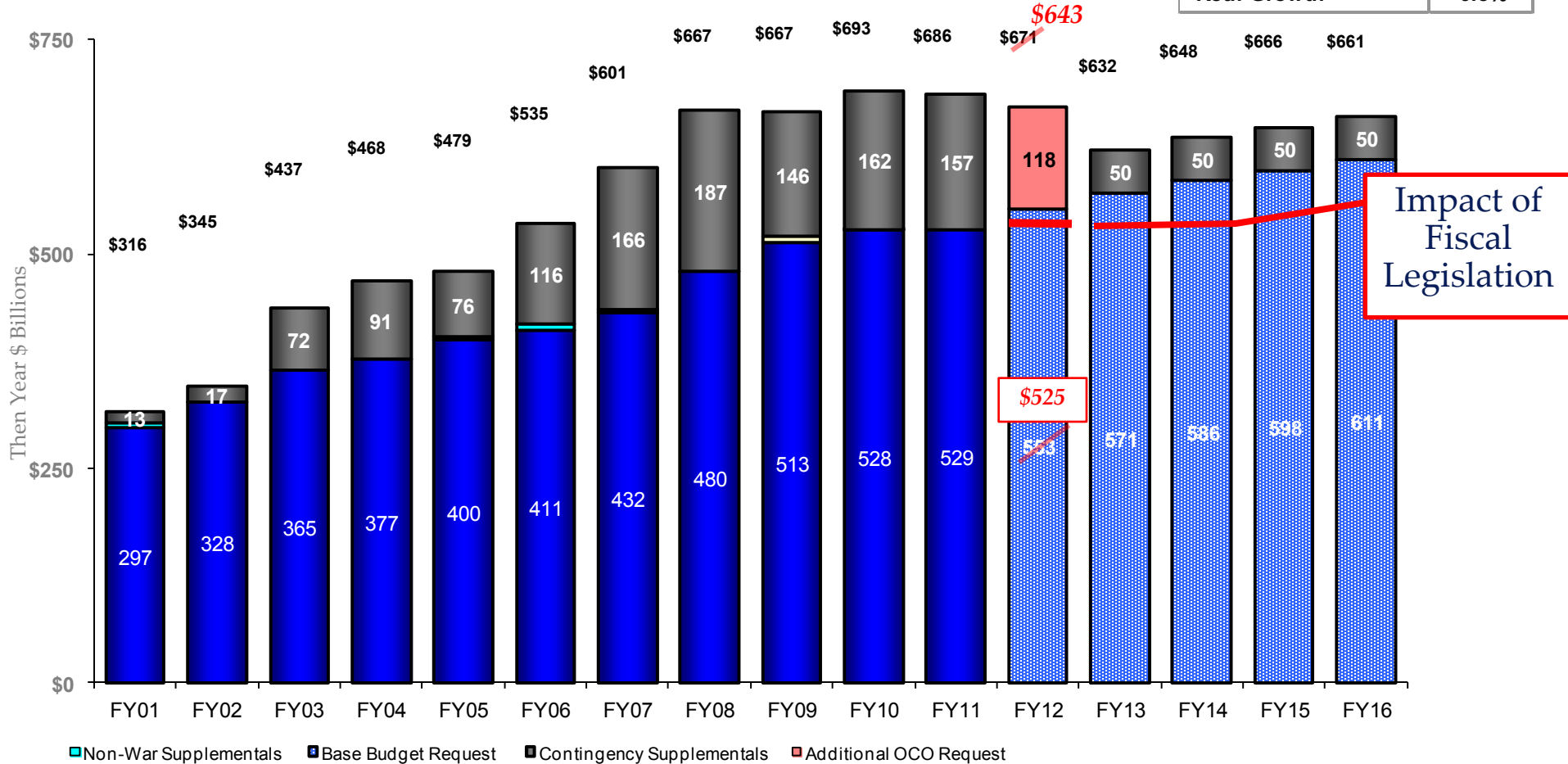
Impacts to DoD Budget

- Pro-rata distribution leaves DoD funding at \$529B/\$526B/\$528B FY 11-13
- If Congress fails to act on the committee's recommendations by the law's deadline of Dec 23rd, then a worse case "Sequestration" could result
 - An automatic across-government spending cut of \$1.2T – 1.5T over 10 years, with one half of the sequestration to be assigned to Defense funds resulting in an additional \$600B or more reduction

“...additional cuts caused by sequestration would hollow out the force, reduce the effectiveness of US alliances worldwide, and break faith with the troops and their families.”

PB12 Defense Spending Outlook

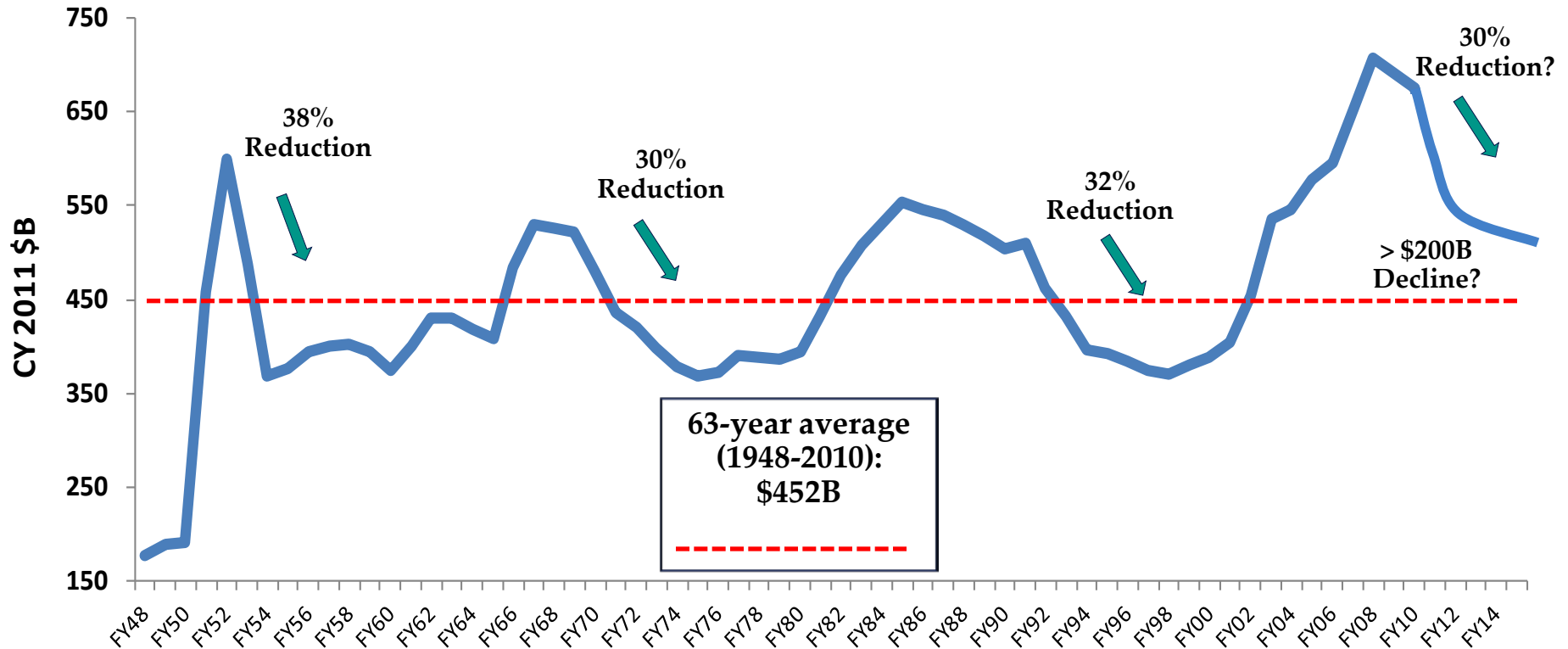
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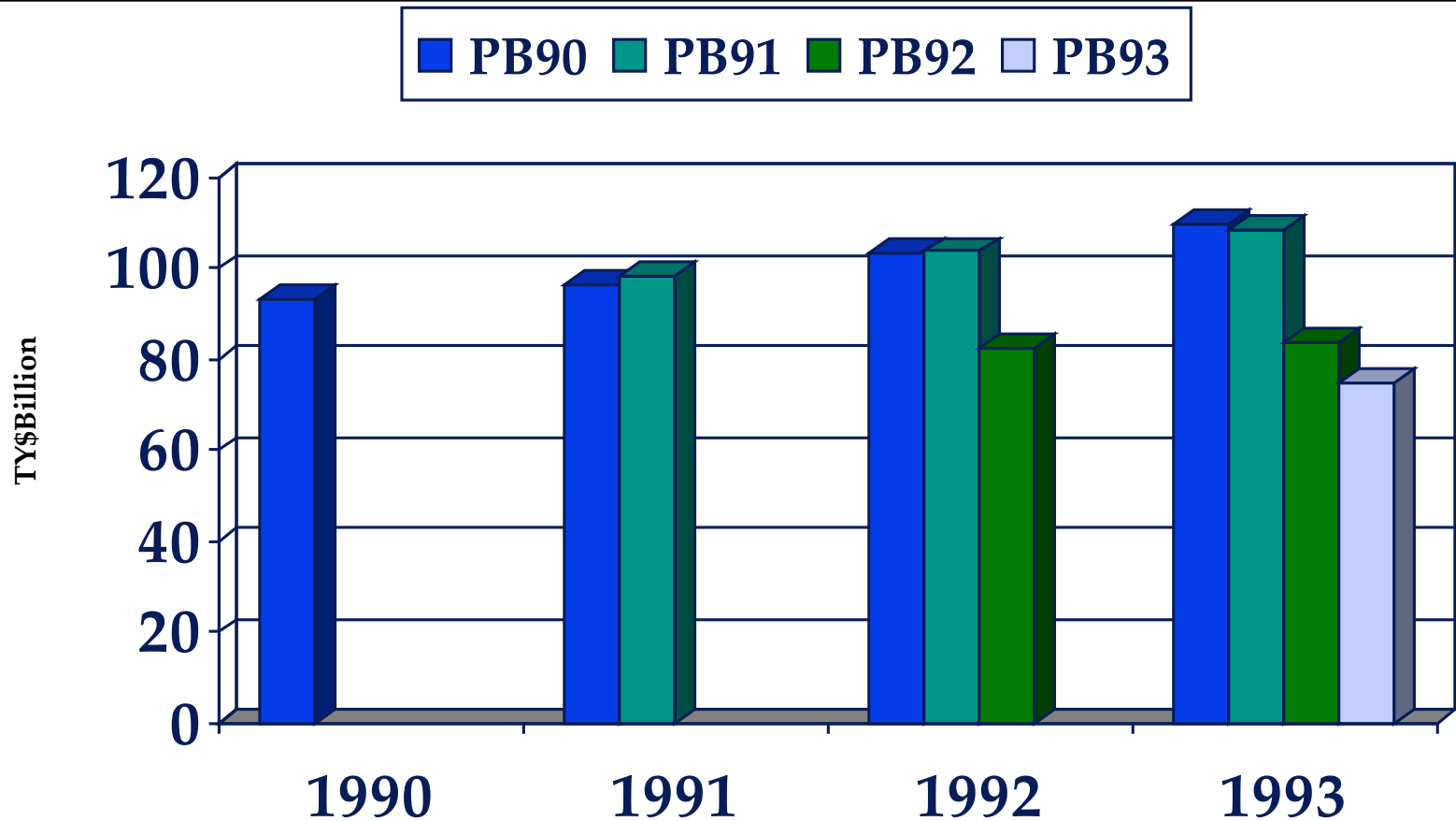
DoD Historical Topline



Source: 2011 President's Budget Historical Tables

History suggests
a downturn is
inevitable

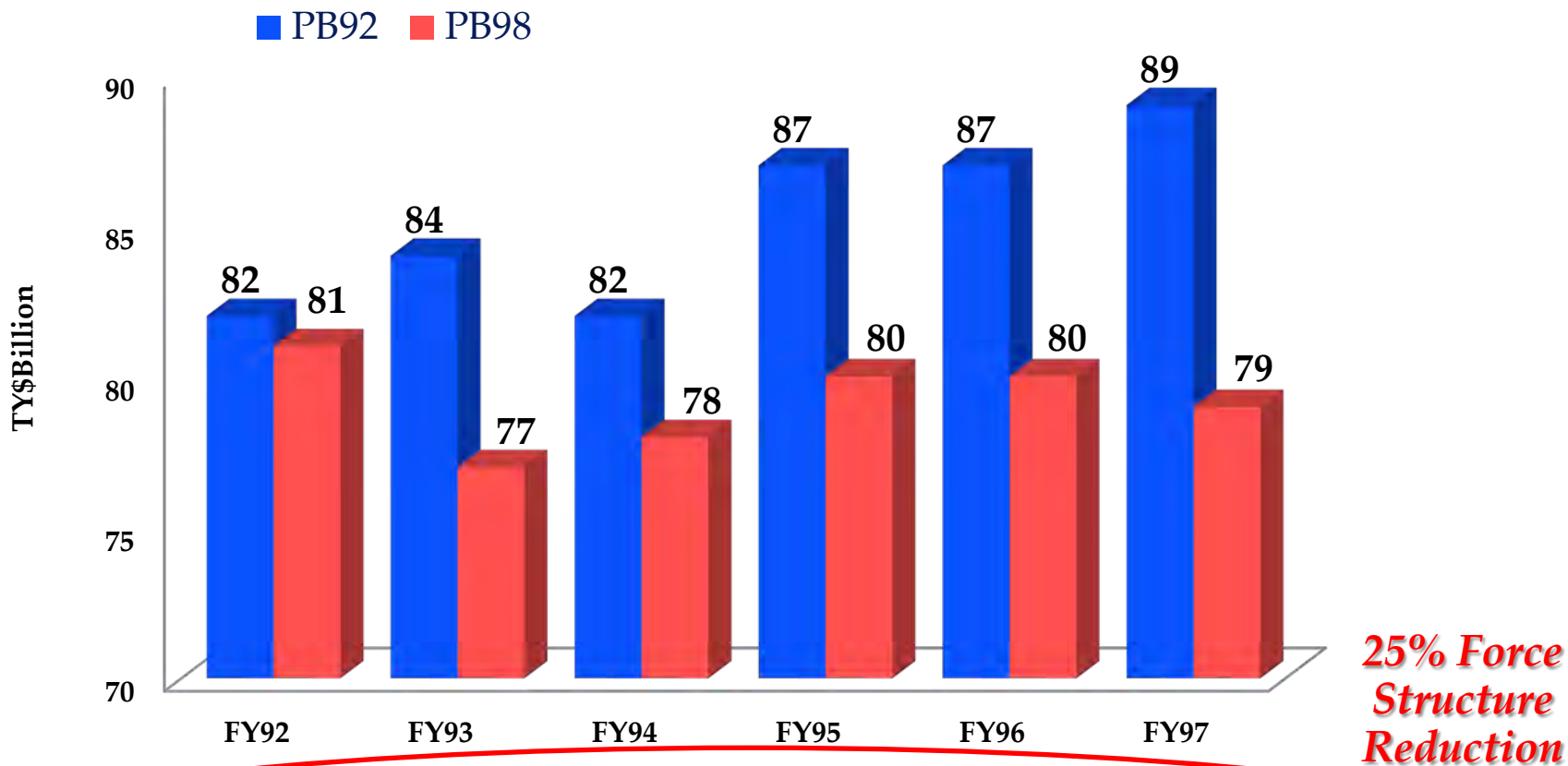
Comparing President Budget PB90-93



	1990	1991	1992	1993
PB90	93.6	96.6	103.4	109.9
PB91		98.6	103.8	108.7
PB92			82.4	83.8
PB93				74.8

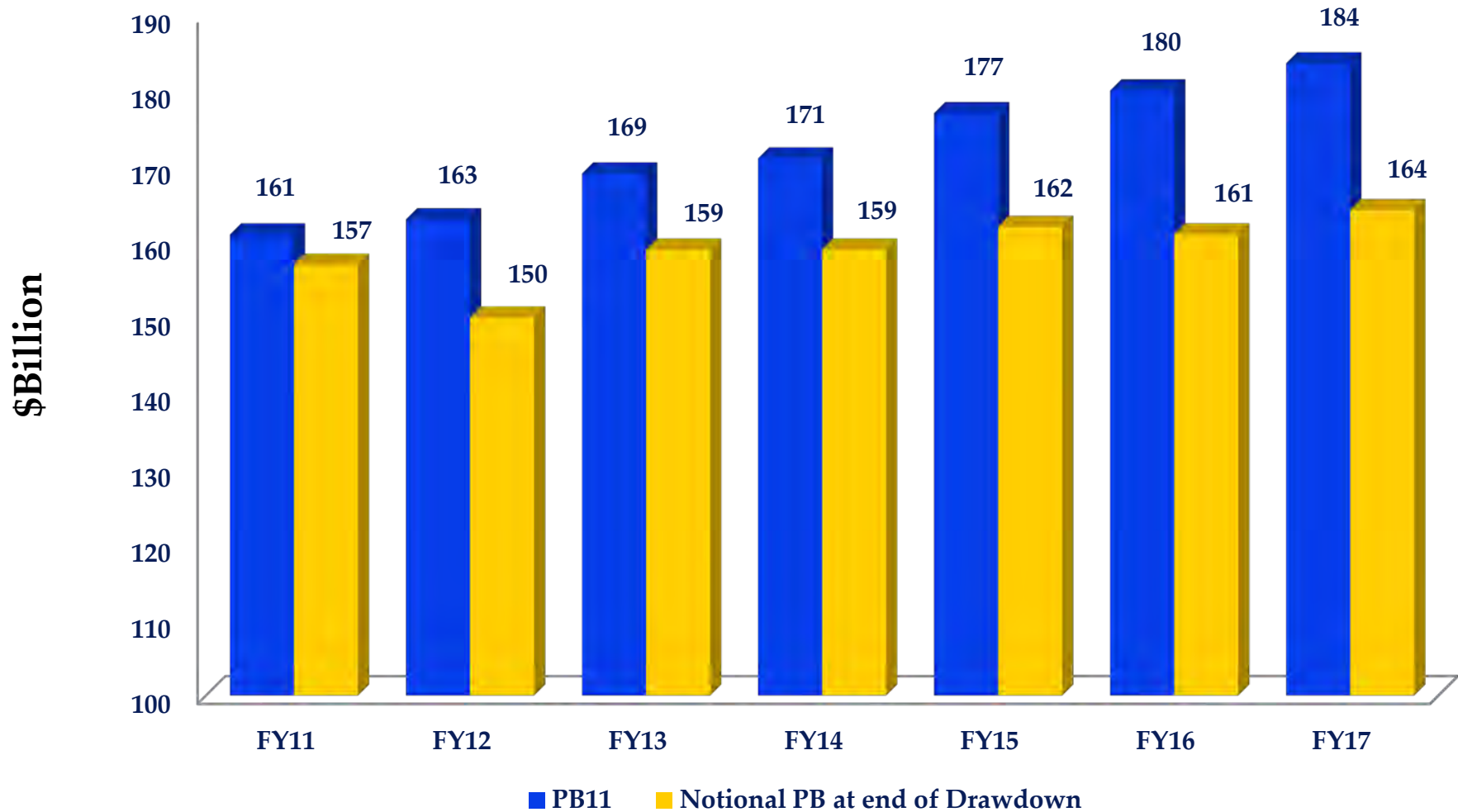
PB-92 Looking ForwardPB-98 Looking Back

Navy TOA and Force Structure ('92 – '97)



Active Forces	FY92	FY93	FY94	FY95	FY96	FY97
End strength	571,294	541,921	509,950	468,662	434,617	416,735
Ships	466	435	391	353	356	354

PB-11 Looking Forward ... PB-17 Looking Back??



Summary by Appropriation Title

FY 2012 Base Budget

MILPERS: \$46.6B

Basic Pays	\$18.5
Housing Allowance	\$7.3
Retired Pay Accrual	\$6.4
Health Accrual	\$3.3
Reserve Personnel	\$2.6
Subsistence	\$2.0
Allowances	\$1.8
Special Pays	\$1.3
Other	\$3.4

Navy Strength 325,700
Marine Corps 202,100

Procurement: \$45.8B

Aircraft	\$18.6
Ships	\$15.5
Weapons Procurement	\$3.4
Marine Corps Procurement	\$1.4
Ammunition Procurement	\$0.7
OPN	\$6.2

Focused Investment

DoN
PB12 SUBMIT



O&M: \$47.9B

Ship Ops	\$12.1
Aviation Ops	\$8.4
Base Ops	\$7.5
Marine Corps O&M	\$6.0
Combat/Weapons Support	\$5.4
Service Wide Support	\$4.7
Training and Education	\$1.8
Reserve O&M	\$1.6
Environmental Restoration	\$0.3

Prevail in Current Conflicts

R&D: \$18.0B

Basic Research	\$0.6
Applied Research	\$0.8
Advance Tech Dev	\$0.7
Adv Component Dev	\$4.4
System Dev & Demo	\$6.5
Management Support	\$0.9
Ops Systems Dev	\$4.1

Balanced Portfolio

Infrastructure: \$3.1B

MILCON	\$2.5
BRAC	\$0.1
Family Housing	\$0.5

Sustaining the Institution

Challenges ...

... and Opportunities



“In this unprecedented fiscal and budgetary environment, we must focus on maintaining the best military in the world and avoid hollowing out our all-volunteer force, while also meeting our obligations to help get our Nation’s economic house in order.

To do so, we must implement savings – in efficiencies, personnel costs, force structure, and modernization and procurement reforms – that are driven by strategy rather than expediency.”

[PUBLIC LAW 784—81ST CONGRESS]

[CHAPTER 946—2d SESSION]

[H. R. 6038]

AN ACT

To authorize the President to determine the form of the national budget and of departmental estimates, to modernize and simplify governmental accounting and auditing methods and procedures, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Budget and Accounting Procedures Act of 1950".

TITLE I—BUDGETING AND ACCOUNTING

PART I—BUDGETING

Sec. 101. Section 2 of the Budget and Accounting Act, 1921 (42 Stat. 20), is amended by adding at the end thereof the following:

"The term 'appropriations' includes, in appropriate context, funds and authorizations to create obligations by contract in advance of appropriations, or any other authority making funds available for obligation or expenditure."

Sec. 102. (a) Section 201 of such Act is amended to read as follows:

"Sec. 201. The President shall transmit to Congress during the first fifteen days of each regular session, the Budget, which shall set forth his Budget message, summary data and text, and supporting detail. The Budget shall set forth in such form and detail as the President may determine—

"(a) functions and activities of the Government;

"(b) any other desirable classifications of data;

"(c) a reconciliation of the summary data on expenditures with proposed appropriations;

"(d) estimated expenditures and proposed appropriations necessary in his judgment for the support of the Government for the ensuing fiscal year, except that estimated expenditures and proposed appropriations for such year for the legislative branch of the Government and the Supreme Court of the United States shall be transmitted to the President on or before October 15 of each year, and shall be included by him in the Budget without revision;

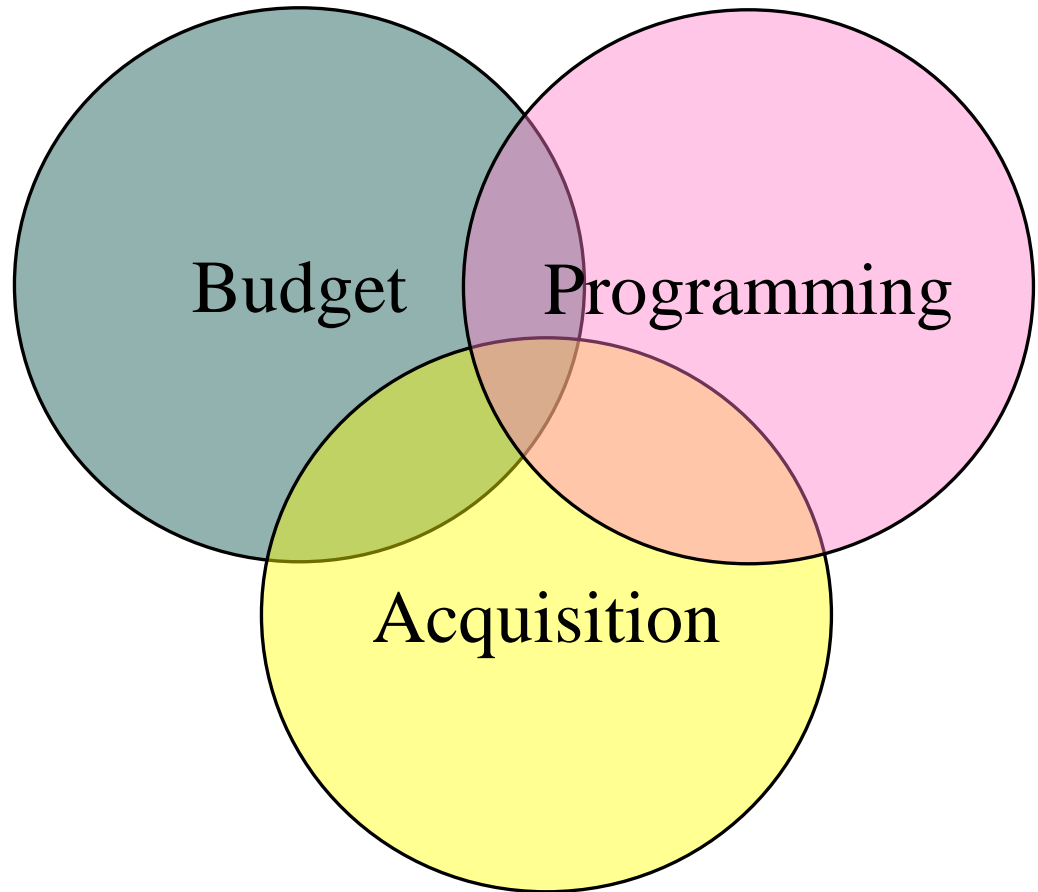
"(e) estimated receipts of the Government during the ensuing fiscal year, under (1) laws existing at the time the Budget is transmitted, and also (2) under the revenue proposals, if any, contained in the Budget;

"(f) actual appropriations, expenditures, and receipts of the Government during the last completed fiscal year;

"(g) estimated expenditures and receipts, and actual or proposed appropriations of the Government during the fiscal year in progress;

"(h) balanced statements of (1) the condition of the Treasury at the end of the last completed fiscal year, (2) the estimated con-

2



The Budget and Accounting Act of 1921 – Section 201

"The President shall transmit to Congress on the first day of each regular session, the Budget, which shall set forth in summary and in detail: ..."

June 10, 1921

FY 2012 – Congressional Action

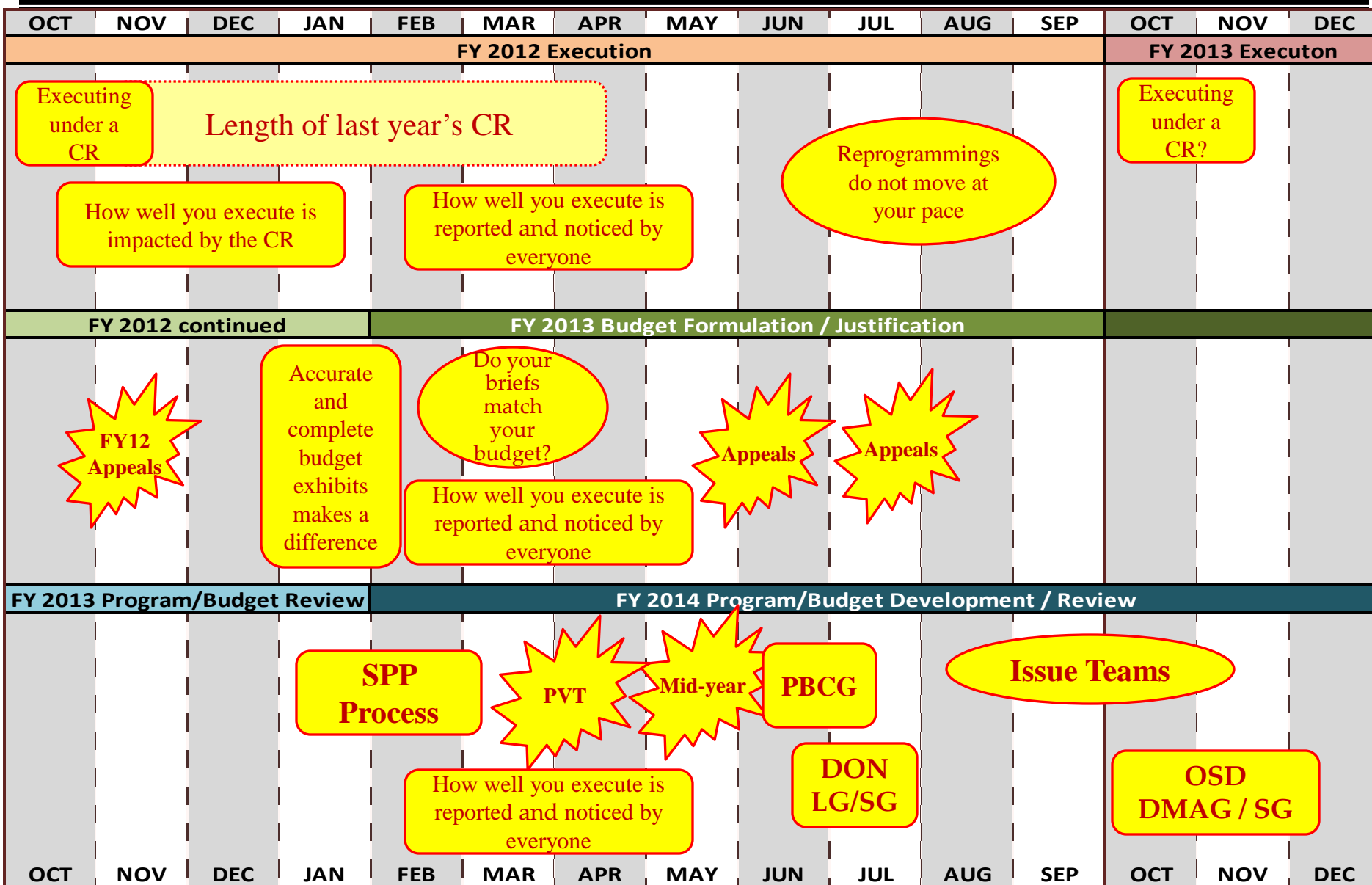
APPN (\$M)	BASE			OCO			Total (Base + OCO)		
	PB12	HAC Delta	SAC Delta	PB12	HAC Delta	SAC Delta	PB12	HAC Delta	SAC Delta
MPN	27,154	-13	-353	919	0	340	28,073	-13	-13
RPN	1,960	-12	-26	44	0	0	2,004	-12	-26
MPMC	13,573	-93	80	675	0	42	14,248	-93	122
RPMC	653	-8	-10	25	0	0	678	-8	-10
OMN (Act)	39,365	20	-1,189	7,006	-257	664	46,371	-237	-525
OMN (Res)	1,323	0	-18	74	0	0	1,397	0	-18
OMMC (Act)	5,960	76	-415	3,571	0	347	9,531	76	-68
OMMC (Res)	271	0	0	36	0	0	307	0	0
ERN	308	0	0	0	0	0	308	0	0
APN	18,587	-782	-995	731	-239	20	19,318	-1,021	-975
WPN	3,408	-432	-127	41	0	0	3,449	-432	-127
PANMC	720	-87	-30	317	0	0	1,037	-87	-30
SCN	14,928	-203	186	0	0	0	14,928	-203	186
OPN	6,285	-289	-150	282	-33	-22	6,567	-322	-172
PMC	1,391	63	-13	1,261	-78	-27	2,652	-15	-40
RDTEN	17,956	-157	-549	54	0	104	18,010	-157	-445
NDSF	1,126	-25	-425	0	0	0	1,126	-25	-425
Total DON	154,968	-1,942	-4,034	15,036	-607	1,468	170,004	-2,549	-2,566

Base to
OCO

\$17M Delta

Better budgets to the Hill results in smaller cuts

Where Our Worlds Collide -- Constantly



Now Repeat After Me – “I Will . . .

- . . . Develop better and more accurate budgets and exhibits
- . . . Embrace CNO’s culture of judiciousness
- . . . When given a new task, do not immediately ask
 - *“Where are my new and greater resources?”*
- . . . Ask everyday *“Is this a need or a want?”*
 - FMB corollary – Almost every stated need is actually a want
- . . . Challenge every growth, strive to match the top performing programs
 - NAVFAC/CEC negative 7-10% returns
 - VA SSN, CLF, etc
 - Look for the second knee in a curve
- . . . Beware the *“Fallacy of savings”*
 - *“10X the gigabytes for only twice the price”* is still twice the price
 - Its not just the *Rate* it is the Total, it is not the *Unit Price* it is the Total Price
 - True energy efficiency is not *Biofuel*, it is not *BTU’s/sec*, it is Total Energy Use

The Department of Defense

Secretary of Defense Leon Panetta

The way ahead:

- Spending choices based on sound strategy and policy
- Balance the need for fiscal solvency
- Aligning resources with our priorities
- Produce a financial statement that passes all financial audit standards
- Tackle wasteful and duplicative spending, and overhead



"I promised, and said continually, as a former Chairman of the Budget Committee and as a former Director of OMB, that I do not believe that we have to choose between national security and fiscal security. What I cannot promise is that this can be achieved without making some very difficult choices. Those choices are essential if we are not to hollow out the force and at the same time meet the threats we confront."

SECDEF 11 October 2011

The role of the Budget Officer

"I neither create nor destroy money. I merely move it around among people who hate me."



Life as a Program Manager

"This is an average year - worse than last but better than next."



Confronting Irregular Challenges

25 October 2011

CAPT Mark Mullins
Navy Irregular Warfare Office
OPNAV N3N5 IW



Current Strategic Drivers

- Global and US Economic stagnation
- Domestic economic uncertainty and the need to cut spending while creating jobs
- Drawdown in Afghanistan, a rapid transition
- Instability in regions traditionally in check (Tunisia, Egypt, Libya, Bahrain, Yemen, Syria, etc)
- The removal of AQ leadership in Iraq, AFG, Yemen and HOA



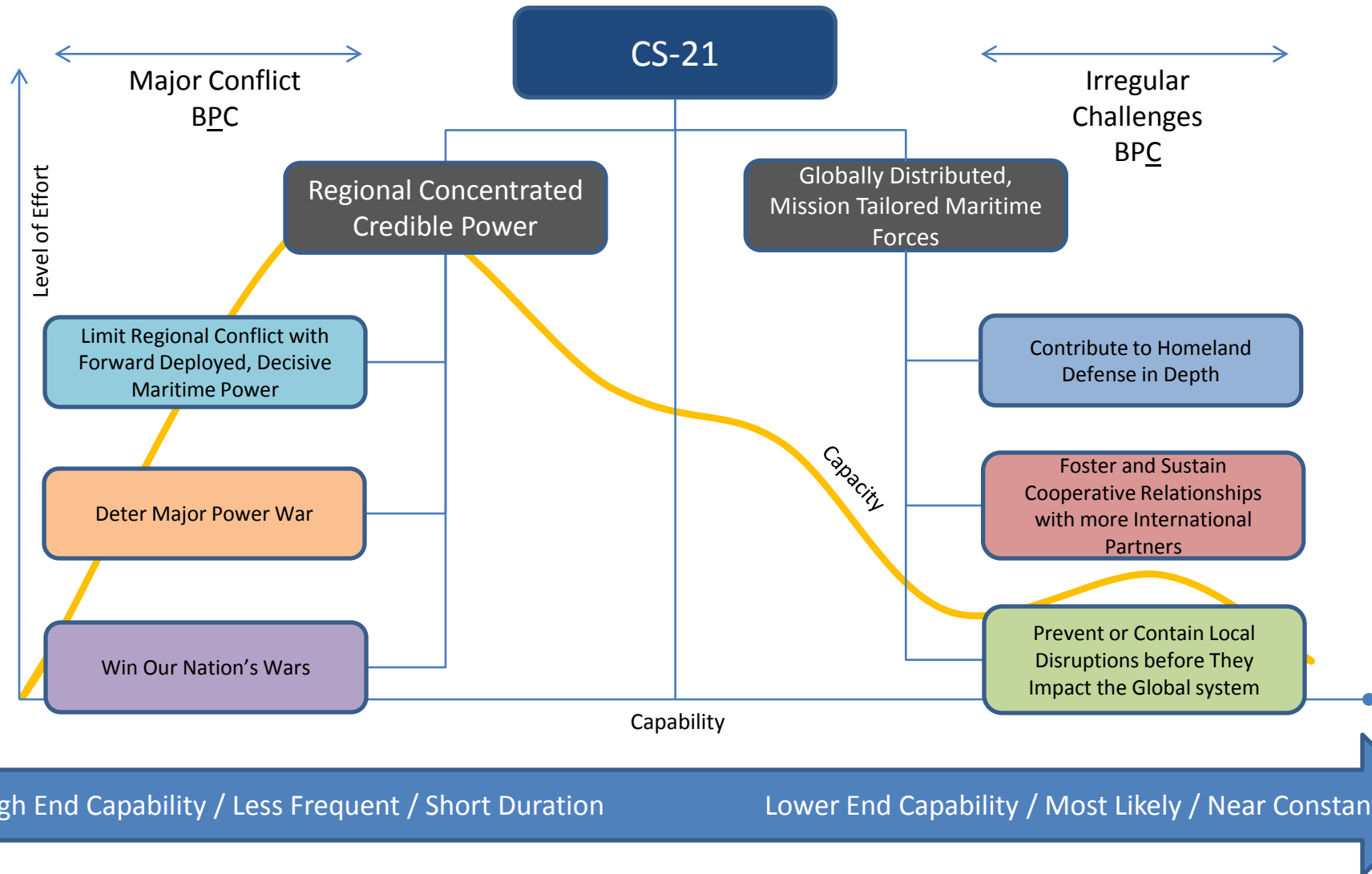
Current Strategic Drivers (cont)

- The reoccurrence of tsunamis, earthquakes, hurricanes, floods and other natural disasters and their effect on funding (nationally and internationally)
- US Election politics and effects on DoD budget
- The expansion of Chinese influence and concern about aspirations
- Our recently released Defense Planning Guidance pairs the Navy against the high-end of the conflict spectrum
- Local trends: Our office, formerly the Navy Irregular Warfare Office, will become Future Operations with NIWO nested within/over the next month.



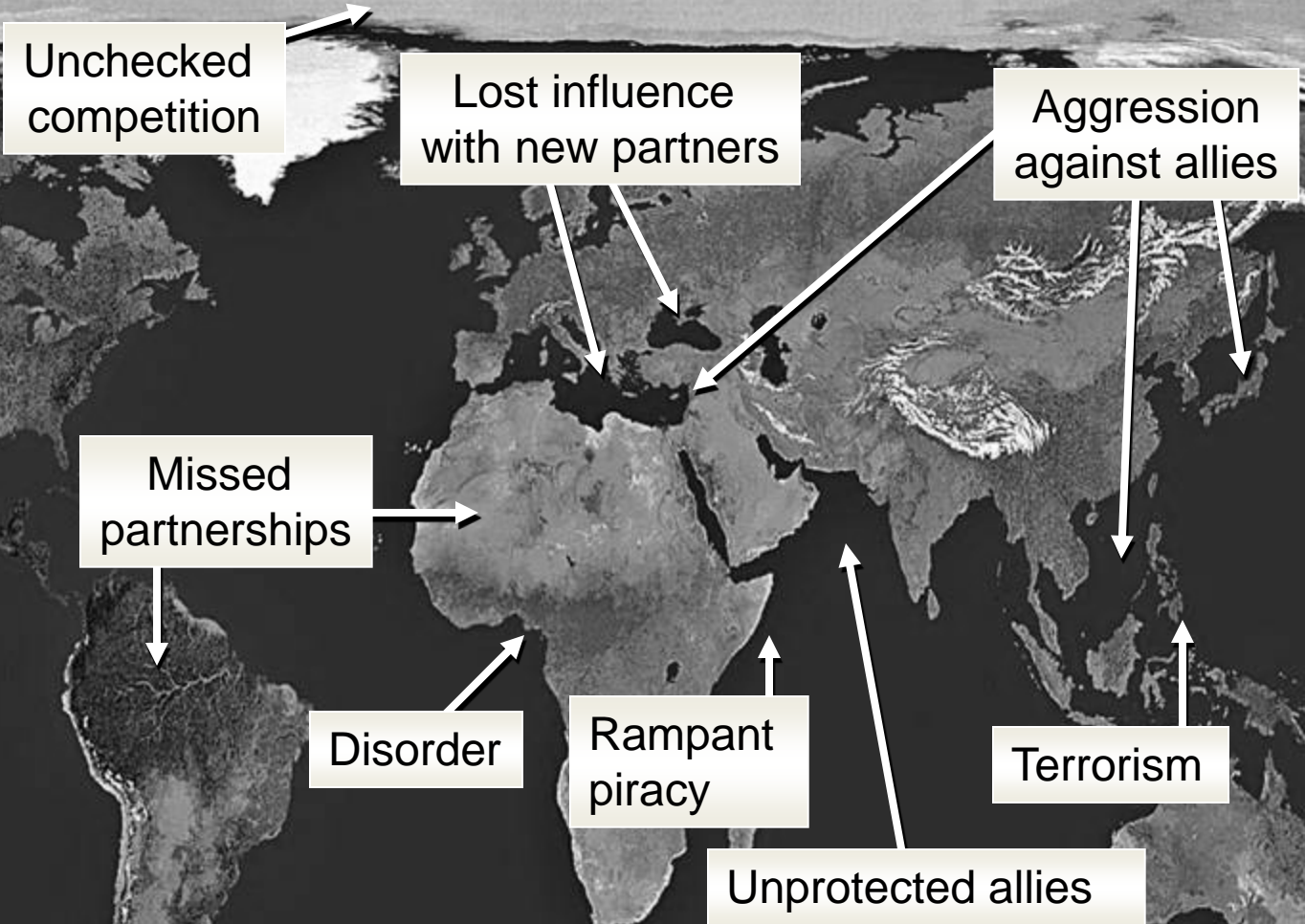
A Cooperative Strategy for 21st Century Seapower

Strategic Pillars and Imperatives





Regional Challenges:



Capacity shortfalls

- Conventional deterrence against aggressors
- Ballistic missile defense for allies
- Intelligence, surveillance and reconnaissance for COCOMs
- Maritime security with partners
- Partnership building with potential partners



A World of Challenges and Opportunities

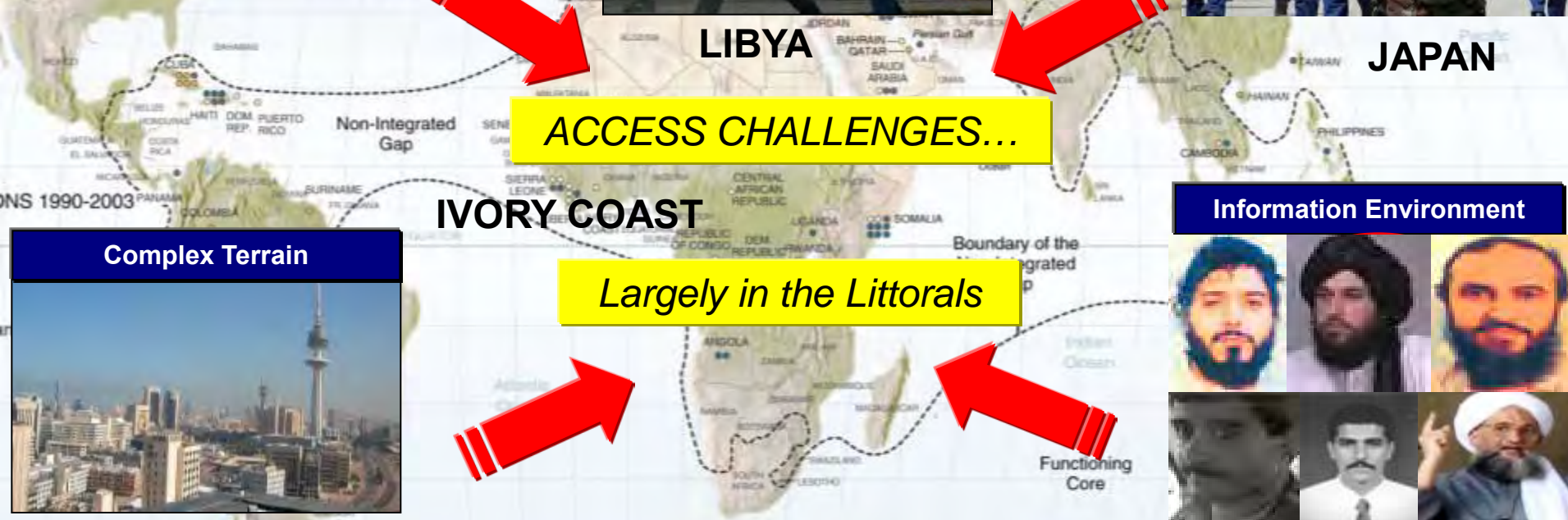
Irregular Threat Capabilities



Wars Amongst the People



Environmental Challenges



Complex Terrain



Information Environment



“We will operate in and from the maritime domain with joint and international partners to enhance regional security and stability, and to dissuade, deter, and when necessary, defeat irregular threats.” US Navy Vision for Confronting Irregular Challenges



Irregular Warfare

An Evolving Dialogue

The global security environment is challenging

- Threats and Opportunities
- Underlying conditions

We confront these challenges by

- Countering the irregular threats
- Preventing and mitigating the underlying conditions



Less about **warfare** and more about the **security environment**

- Seven mission areas:
 - Maritime Security Operations
 - Stability Operations
 - Security Force Assistance
 - Foreign Internal Defense
 - Counterinsurgency
 - Counter Terrorism
 - Information Dominance



Irregular Warfare

An Evolving Dialogue

Several strategic documents affirm the focus on the environment

- **QDR 2010** – “building partner capacity”
- **IW: Countering Irregular Threats JOC 2.0** – “understanding of IW continued to evolve”
- **National Security Strategy** – “comprehensive engagement,” “constructive cooperation”
- **National Military Strategy** – “preventing wars is as important as winning them”

In January 2010, CNO codified our focus on the environment by signing the US Navy’s Vision for Confronting Irregular Challenges

“We need to broaden the way we speak about Irregular Warfare and Irregular Challenges” – CNO March 2011



Confronting Irregular Challenges (CIC)

Myth vs. Truth

Myth:

- Detrimental to Conventional capability
- A fad or temporary condition
- Specialized systems or single-use skills
- Cost ineffective
- Only about SOF and NECC
- About a “lesser-included” approach
- Only the enemy and others are asymmetric and have asymmetric capabilities

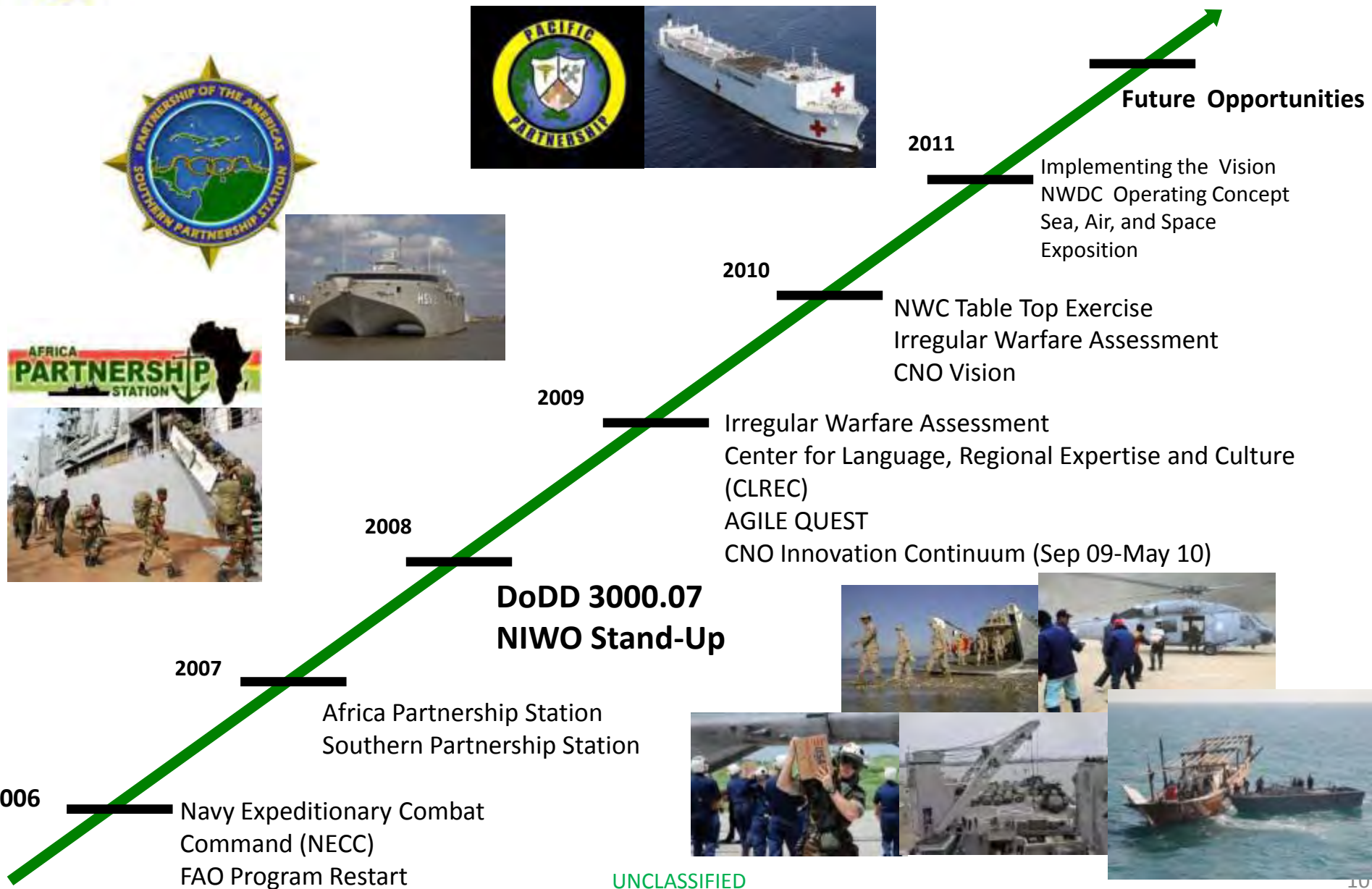
Truth:

- USN, USMC, USCG, SOF Alignment
- About the challenges of today and the future
- Capabilities that compliment all phases
- Preventive and reactive
- General Purpose Force proficiency / About all Naval Capabilities
- Comprehensive Government Approach
- Navy’s relevance to COCOM demand / priorities
- Not new





Evolution of the Navy's Efforts in Confronting Irregular Challenges





Strategy for Confronting Irregular Challenges

MEANS

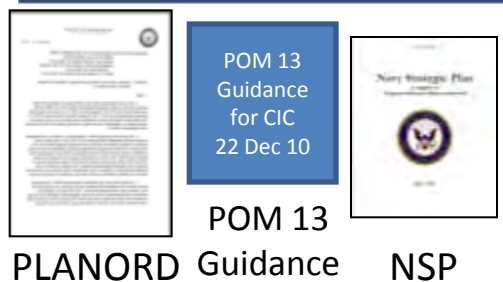
- Effective application of people, platforms, systems, and units
- Participation in budget decisions
- Strategy/Policy
- Emerging technological requirements

WAYS

- Security Force Assistance
- Foreign Internal Defense
- Maritime Security Operations
- Stability Operations
- **Information Dominance**
- Counterinsurgency
- Counterterrorism

ENDS

- Increased effectiveness in stabilizing and strengthening regions
- Enhanced regional awareness
- Increased partner capability and capacity
- Expanded coordination and interoperability



“Navy is prepared fully to work with partners to stabilize regions at risk, and when necessary, dissuade, deter, and defeat irregular actors who seek to undermine security, stability, and prosperity”
CNO Foreword - US Navy’s Vision for Confronting Irregular Challenges



Focused Investments

PB-10

- LCS
- JHSV
- Counter IED
- NECC
- MESF
- UAS ISR
- JFK IW Center

PB-11

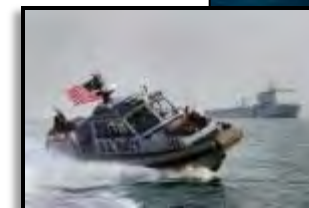
- J-CREW
- RW/MPN for SOF
- 4th Riverine
- Mid Range UAV
- JHSV
- LCS
- PC SLEP
- Security Force Training

POM-12

- J-CREW
- RW Support to SOF
- 4th Riverine
- MRUAS
- JHSV
- LCS Maritime Sec. Module
- LREC
- EOD Training
- WMD Forensics
- Link 22
- STUAS

STUDY AREAS

- GPF-SOF Integration
- Naval Capabilities
- Navy Role in Confronting Irregular Challenges
- DOTMLPF Implications
- Maritime Security Force Assistance
- Preparing the Navy to leverage the Interagency





Maritime Security Force Assistance

Advising

Law Enforcement techniques
 Medical
 HUMINT
 EOD/IED

Training

Small Boat Operations
 Sustainment of capability (maintenance)
 Maritime enforcement (VBSS)
 International Defense Management
 Course
 Maritime Infrastructure protection
 International Defense Acquisition and
 Resource Management (IDARM)

Exercises

ASW Exercises
 Maritime Patrol Exercises
 EOD Exercises
 VBSS Exercises

IMET

Aircraft / Pilot
 NPS Masters Programs
 NAVSCIATTS
 SWOS
 Weapons Systems

Events:

PACFLT: 6
 NAVAF: 6
 NECC: 12
 USFF: 4
 NETSAFA: 25
 NAVCENT: 13
 NAVEUR: 6
 NPS: 9
 NAVSO: 5

TOTAL: 86

JUNE 2011

Key:

 = Engaged Countries



A 21st Century Navy Narrative for a Total Force Strategy

- Addresses Challenges to access and effectiveness in the face of low-end and high-end threats—*e.g. near-peers capable of A2/AD, non-state actors with high-tech weapons in low-tech hands.*
- Achieve tangible, essential effects with regional partners:
 - Cultivate Opportunity:
 - Promote US commerce, trade, and investment opportunities
 - Protect interests, cultivate relationships
 - Prevent regional conflict and hegemonic expansion
- Total Force Strategy Outcomes:
 - Cost-effective and tailored, non-provocative partner engagement and crisis response
 - Achieving military interoperability with a diverse range of non-traditional allies/partners
 - Building partnerships which maintain vital access to high-value regions

- Strategic Deterrence
- Regional Engagement and Partnering
- Conditions created for US to thrive



Questions Worth Asking

- What should the US Strategy be globally and how does the Navy contribute?
- How do we balance investments between the most likely and the most dangerous scenarios?
- How is relevance maintained in the mid-to-long term if the primary focus is deterrence for a near peer?
- If we're not engaged regionally with purpose, who fills the vacuum and at what cost to the region and to the US?
- How do we evaluate ROI in the high end or the low end?
- Should the Navy be viewed as a conditions setter for a prosperous US economy or a break-glass in case of war high-end deterrence capability?



DISCUSSION



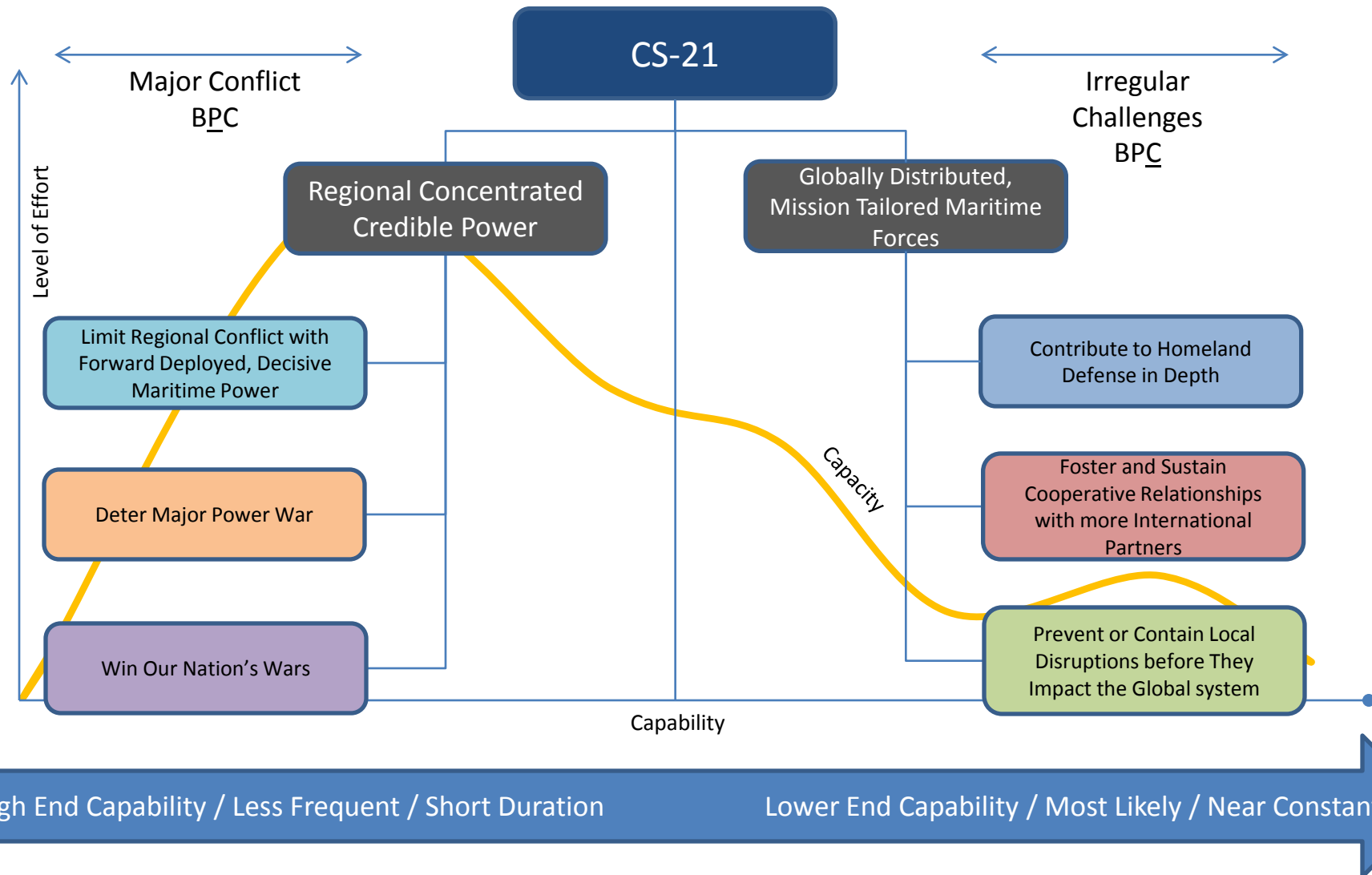
25 October 2011

CAPT Mark Mullins
Navy Irregular Warfare Office
OPNAV N3N5 IW



A Cooperative Strategy for 21st Century Seapower

Strategic Pillars and Imperatives





Definitions

- **Irregular Warfare** — A violent struggle among state and non-state actors for legitimacy and influence over the relevant population(s). Irregular warfare favors indirect and asymmetric approaches, though it may employ the full range of military and other capacities, in order to erode an adversary's power, influence, and will. (JP 1)



Definitions cont...

- **security force assistance** — The Department of Defense activities that contribute to unified action by the US Government to support the development of the capacity and capability of foreign security forces and their supporting institutions. Also called **SFA**. (JP 3-22)
- **counterinsurgency** — Comprehensive civilian and military efforts taken to defeat an insurgency and to address any core grievances. Also called **COIN**. (JP 3-24)
- **counterterrorism** — Actions taken directly against terrorist networks and indirectly to influence and render global and regional environments inhospitable to terrorist networks. Also called **CT**. (JP 3-26)



Expeditionary Warfare Conference 2011



Dr. Walter Jones

Executive Director

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

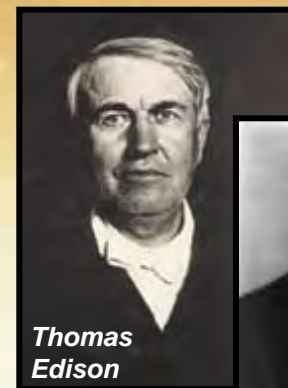
The Office of Naval Research

Naval Research Laboratory (*Appropriations Act, 1916*)

"[Conduct] exploratory and research work...necessary ...for the benefit of Government service, including the construction, equipment, and operation of a laboratory...."

Office of Naval Research (*Public Law 588, 1946*)

"...plan, foster, and encourage scientific research in recognition of its paramount importance as related to the maintenance of future of naval power, and the preservation of national security..."



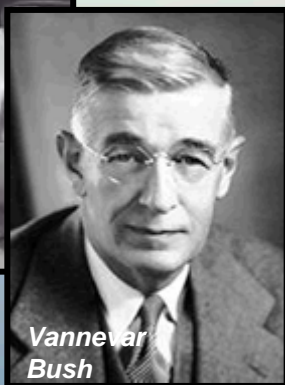
Thomas
Edison



Josephus
Daniels



Harry S.
Truman



Vannevar
Bush

Office of Naval Research - London Office (*1946*)

"...reporting on the latest developments and to assist visiting American scientists to make contact with their colleagues in Europe..."

Transitioning S&T (*Defense Authorization Act, 2001*)

"...manage the Navy's basic, applied, and advanced research to foster transition from science and technology to higher levels of research, development, test, and evaluation."

Naval S&T Milestones

ACCOMPLISHMENTS ACROSS ALL DOMAINS

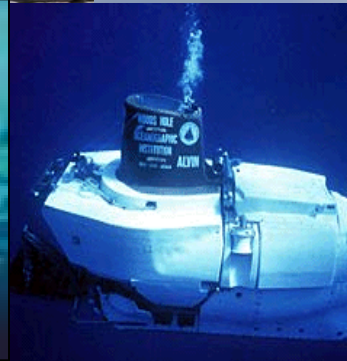


										VIRTUAL AT-SEA TRAINING (LIVE-FIRE COMBAT SKILLS)	NOBEL PRIZE TO ONR RESEARCHERS FOR GRAPHENE
						NTS-2 SATELLITE IN NAVSTAR GPS	NOBEL PRIZE TO DR. JEROME KARLE, NRL	NAVY AEROSOL ANALYSIS AND PREDICTION SYSTEM	HIGH TEMPERATURE SUPERCONDUCTIVE DEGAUSSING	FREE ELECTRON LASER	
				TIMING AND NAVSTAR GPS		CORONAL MASS EJECTION	HIGH-ENERGY MAGNETS	CLEMENTINE SPACECRAFT	HYPERSPECTRAL IMAGER FOR COASTAL OCEANS	TACTICAL MICROSATellite	
	FIRST DETECTION OF X RAYS FROM THE SUN	FIRST UNMANNED HELICOPTER	OWENS VALLEY 40M RADIO TELESCOPE		MOBILE ROBOTS	ONR-FUNDED TECH FINDS RMS TITANIC	INTERACTIVE MULTISENSOR ANALYSIS TRAINING (IMAT)	SHARP RECONNAISSANCE	LARGE DISPLACEMENT UNMANNED UNDERWATER VEHICLE		
MULTISTATIC RADAR TESTED AT NRL	PLAN-POSITION INDICATOR	FIRST FAR-ULTRAVIOLET SPECTRUM OF THE SUN	VANGUARD I LAUNCHED	AQUEOUS FILM FORMING FOAMS (AFF)	EXCIMER LASER TECHNOLOGY	GLOBAL ATMOSPHERIC PREDICTION SYSTEM	HIGH-STRENGTH LOW-ALLOY STEELS	DRAGON EYE UAV	INTEGRATED TOPSIDE (INTOP)		
SOUND NAVIGATION AND RANGING (SONAR)	URANIUM 235 PRODUCTION	PRINCIPLES OF MODERN FRACTURE MECHANICS	PROJECT WHIRLWIND DIGITAL COMPUTER	FIRST U.S. INTELLIGENCE SATELLITE	FAR ULTRAVIOLET LUNAR CAMERA	SIDEWINDER AIR-TO-AIR MISSILE	NEURAL NETWORKING COMPUTER CHIPS	FIRST OPERATIONAL GLOBAL OCEAN MODEL	CBR SENSORS FOR FLEET SECURITY		
GAMMA-RAY RADIOGRAPHY	FIRST CONCEPT FOR A NUCLEAR SUBMARINE	SYNTHETIC LUBRICANTS	PARTICLE ACCELERATORS	SEALAB I AND II	LITHIUM BATTERIES	CONTRIBUTED TO AEGIS COMBAT SYSTEM	ULTRA-HIGH STRENGTH STEEL	QUIKCLOT COMBAT GAUZE	WORLD-RECORD SETTING 33 MJ EMRG SHOT		
NRL COMMISSIONED	FIRST U.S. RADAR PATENTS	ONR FOUNDED 1946	VERTICAL TAKE-OFF AND LANDING	BATHYSCAPHE TRIESTE REACHES 35,800 FT.	SOUND SURVEILLANCE SYSTEM (SOSUS)	ACOUSTIC MICROSCOPY	HULL ANTI-FOULING COATINGS	REMOTE ENVIRONMENT MONITORING UNITS	ANTI-TORPEDO TORPEDO		
1920s	1930s	1940s	1950s	1960s	1970s	1980s	1990s	2000s	2010 & BEYOND		

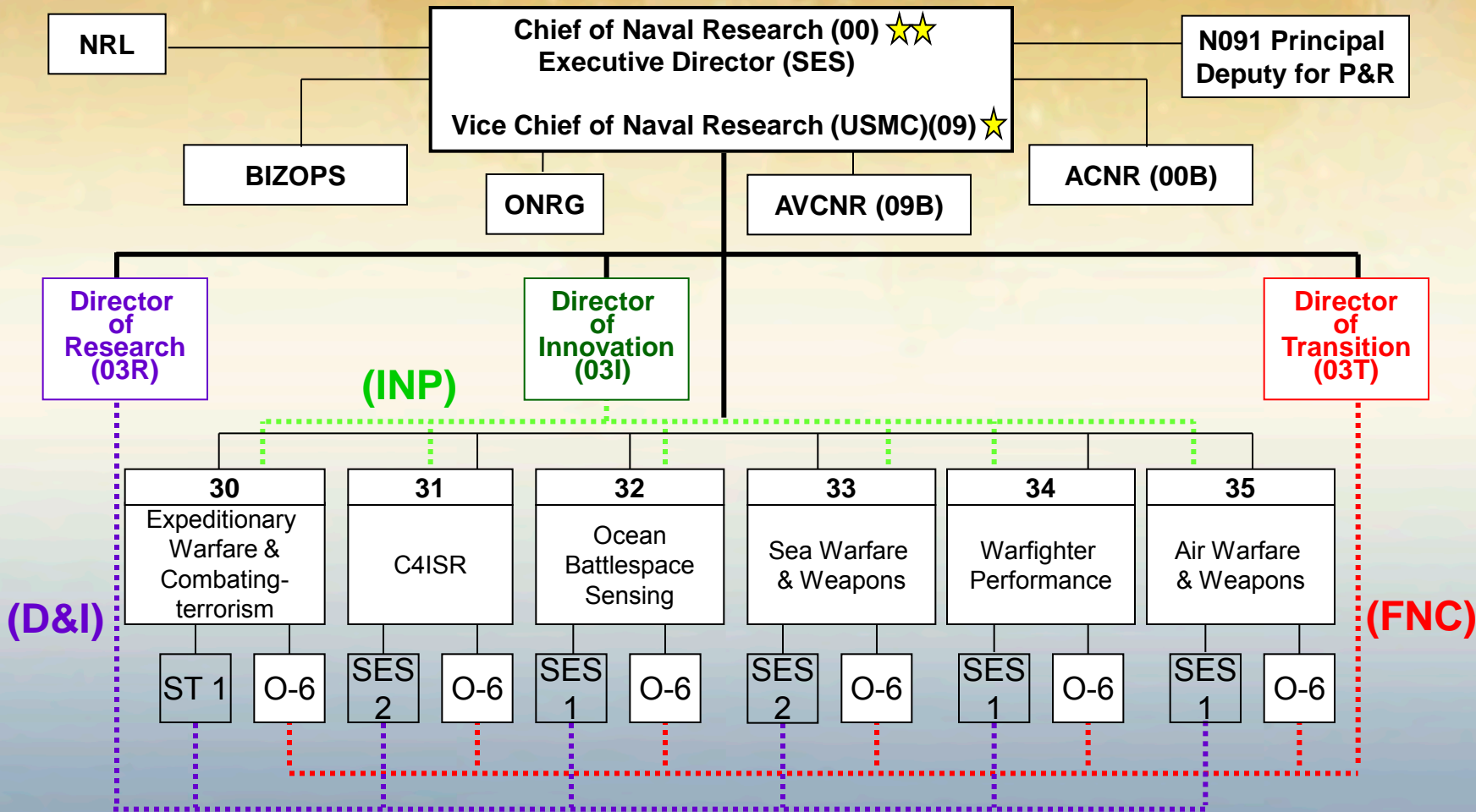
Who We Are

ONR/NRL

People: **3,900**
Govn't: **3,360**
Contractor: **540**
PhDs: **842**
SES: **45**
USNR: **212**



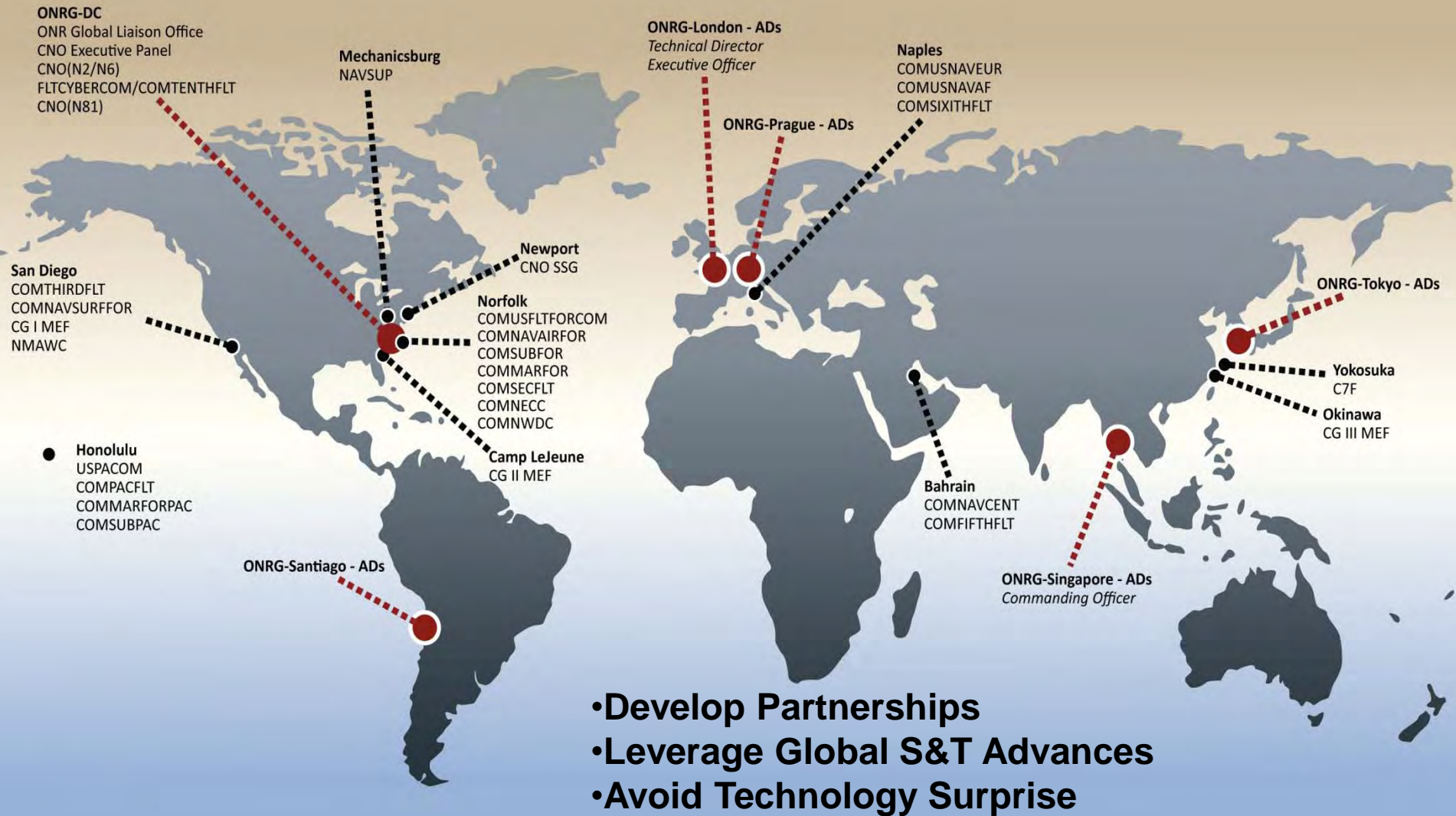
ONR Organization



Department of the Navy Research Enterprise



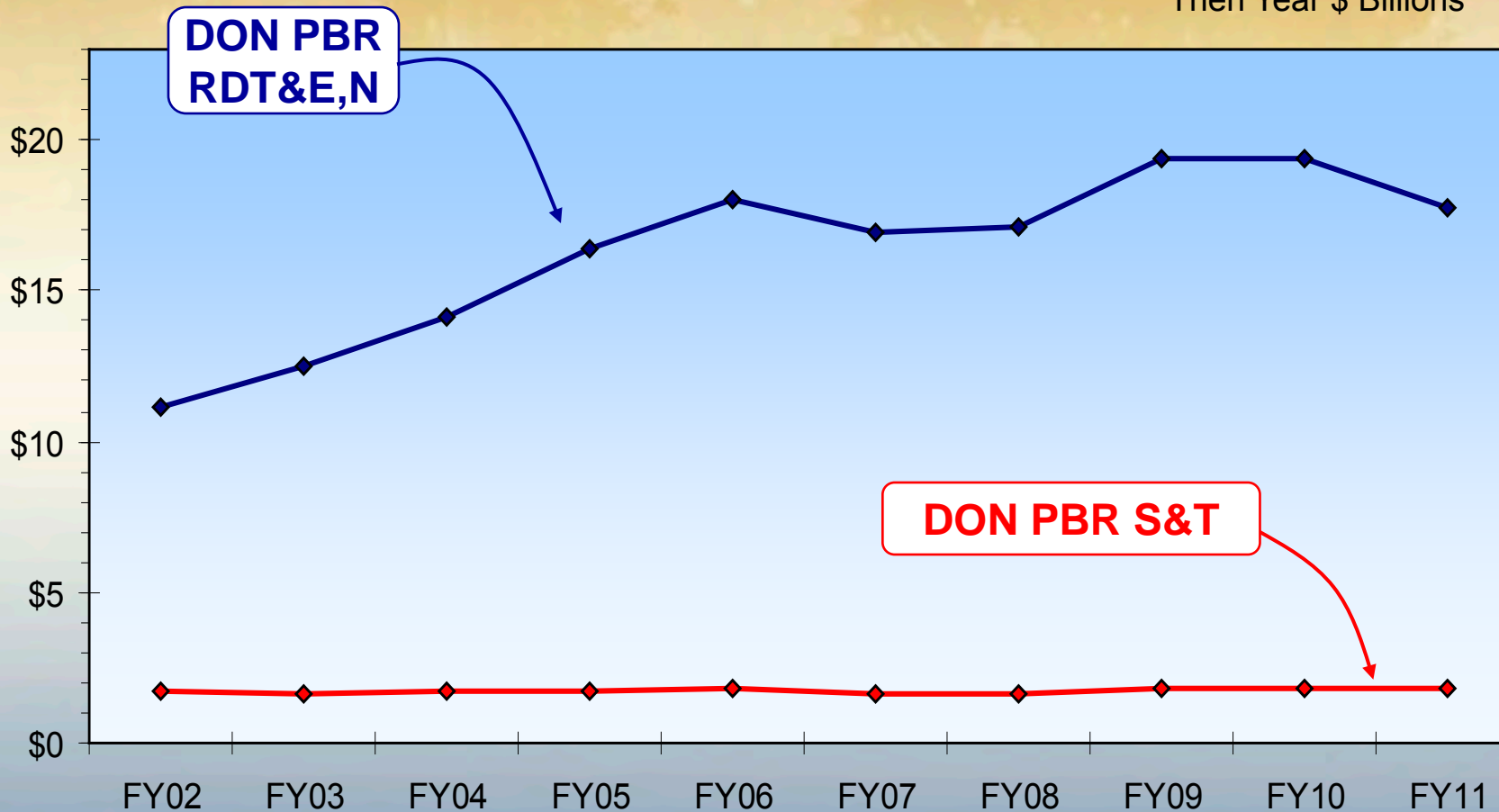
ONR-Global



- Develop Partnerships
- Leverage Global S&T Advances
- Avoid Technology Surprise

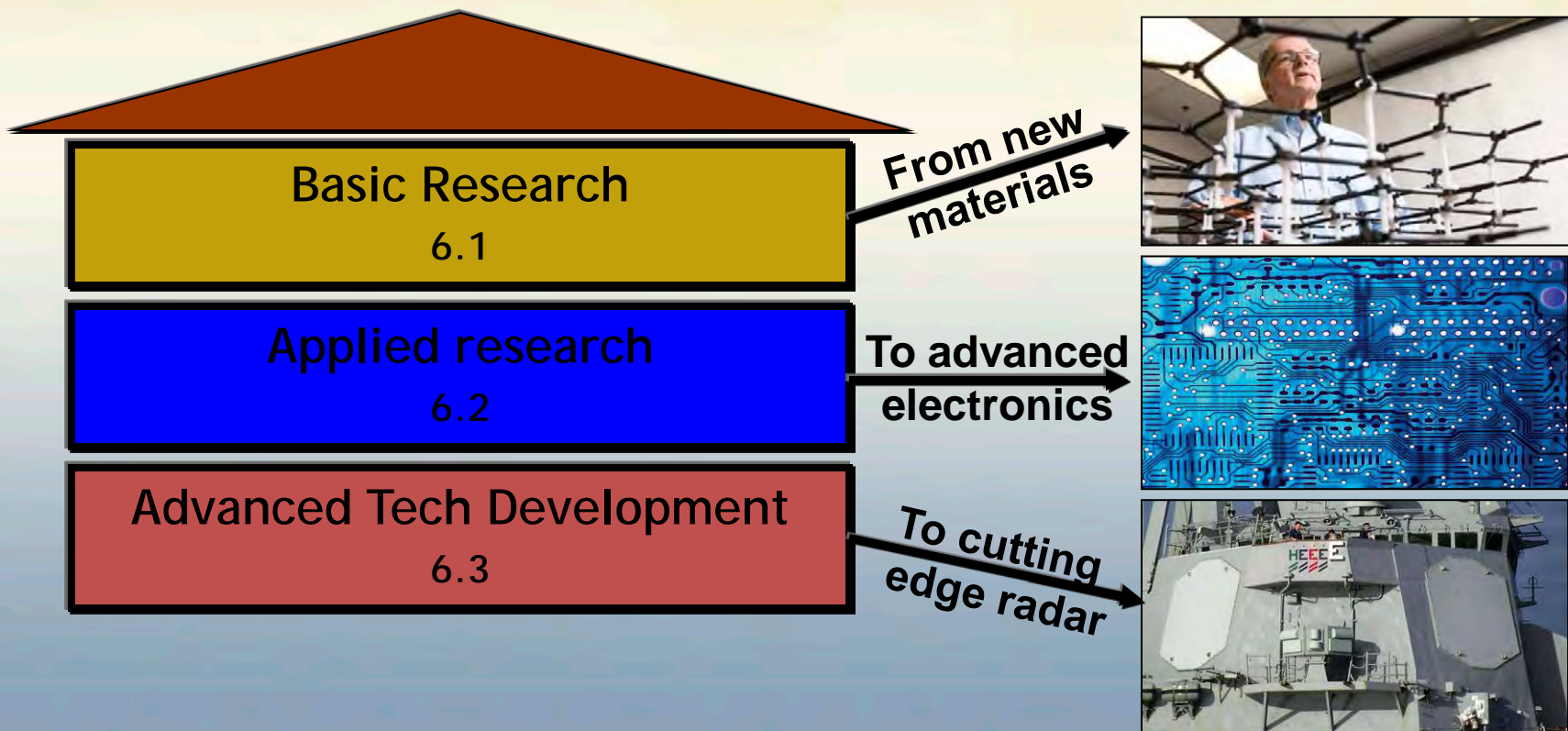
RDT&E 6.1 - 6.7

Then Year \$ Billions



Unique Structure

- All three S&T funding lines under one roof
- Program Officer can see a program through D&I → Applied Science → Transition



Leadership for S&T



RADM Nevin Carr Jr.
Chief of Naval
Research



Dr. Walter Jones
Executive Director



BGen Mark R. Wise
Vice CNR

Guidance Comes From...



**Assistant Secretary of the Navy
(Research, Development
and Acquisition)**



**Vice Chief of
Naval Operations**



**Assistant Commandant
for the Marine Corps**



**Assistant Secretary of Defense
for Research & Engineering**

CNR 2011 Priorities

CNR 2011 Priorities

1. **Focus on S&T areas that provide the biggest payoff for our future**
2. **Be innovative in our thinking and business processes**
3. **Improve transition of S&T products into acquisition programs and the Fleet**
4. **Expand strategic communication and engagement with stakeholders**

- High-Payoff S&T Areas:
 - Power & Energy
 - Directed Energy & Hypersonics
 - Information Dominance
 - Autonomous Systems
 - Total Ownership Cost Reduction
 - Expeditionary & Irregular Warfare
 - Naval Warfighter Performance
- Support the ONR Business Plan
 - Implement Lab Demo
 - Achieve and declare audit readiness
 - Prepare to double our support for STEM
 - Implement a peer review process for Basic Research
 - Prepare to transition to ERP, and incorporate KM
 - Expand career development to include Executive Education
- Improve alignment with requirements
 - Support “Speed to Fleet” initiatives
 - Address “Valley of Death” challenges
 - Expand ONRG and Science Advisor program
- Ensure we understand customer needs and they understand how we’re working to meet those needs
 - Tell the ONR story, “Leading the Vision, Delivering Results”
 - Communication is a leadership responsibility

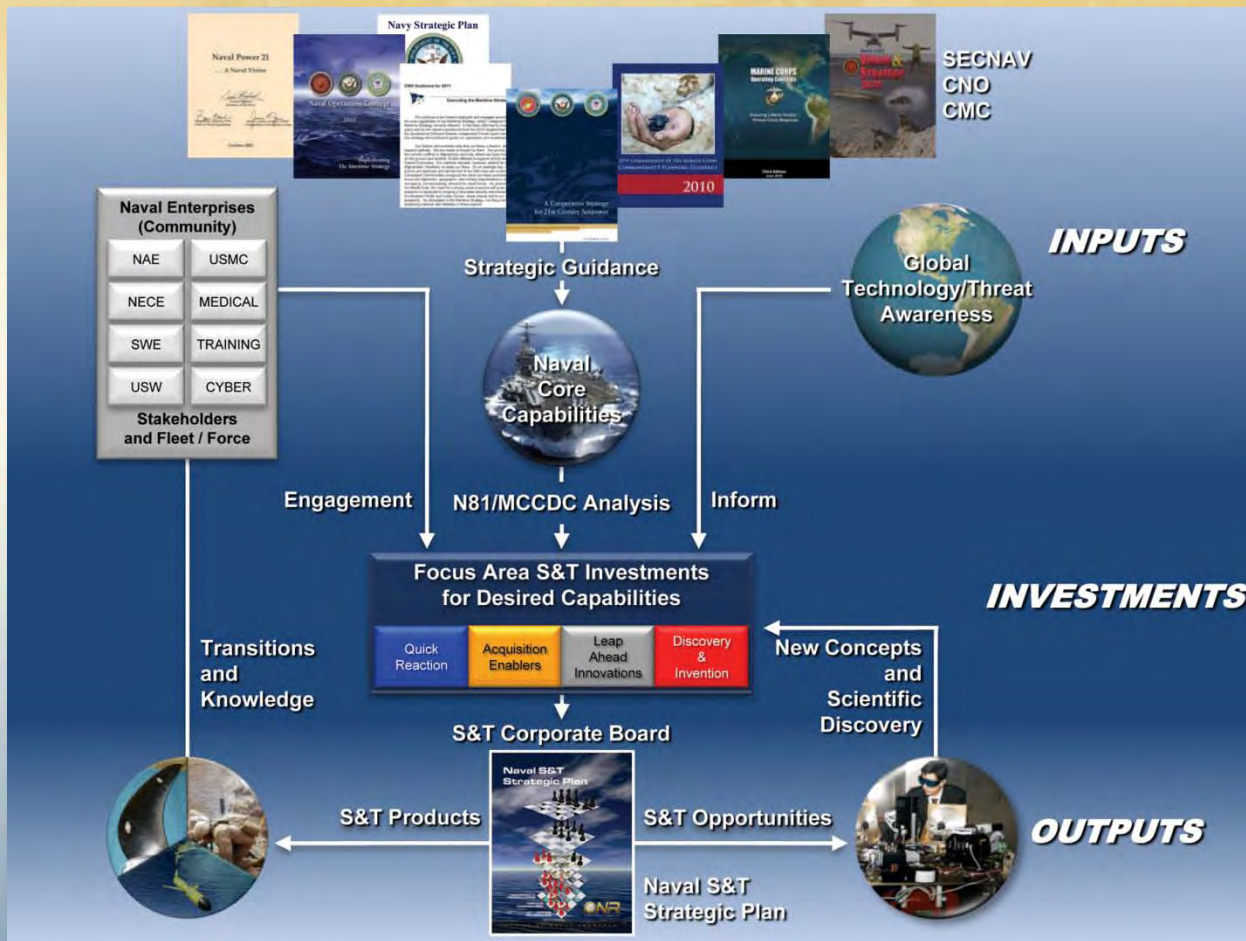


Naval S&T Strategic Plan



- Second update of the original Naval S&T Strategic Plan
- Focused on top-down guidance, informed by fiscal realities of POM13
- Strategic Context – development guided by CS-21, SECNAV Guidance, NSP, and Vision and Strategy 2025
- Focus Areas consolidated from 13 to 9; includes addition of one new area on Autonomy and Unmanned Systems

Naval S&T Strategic Process

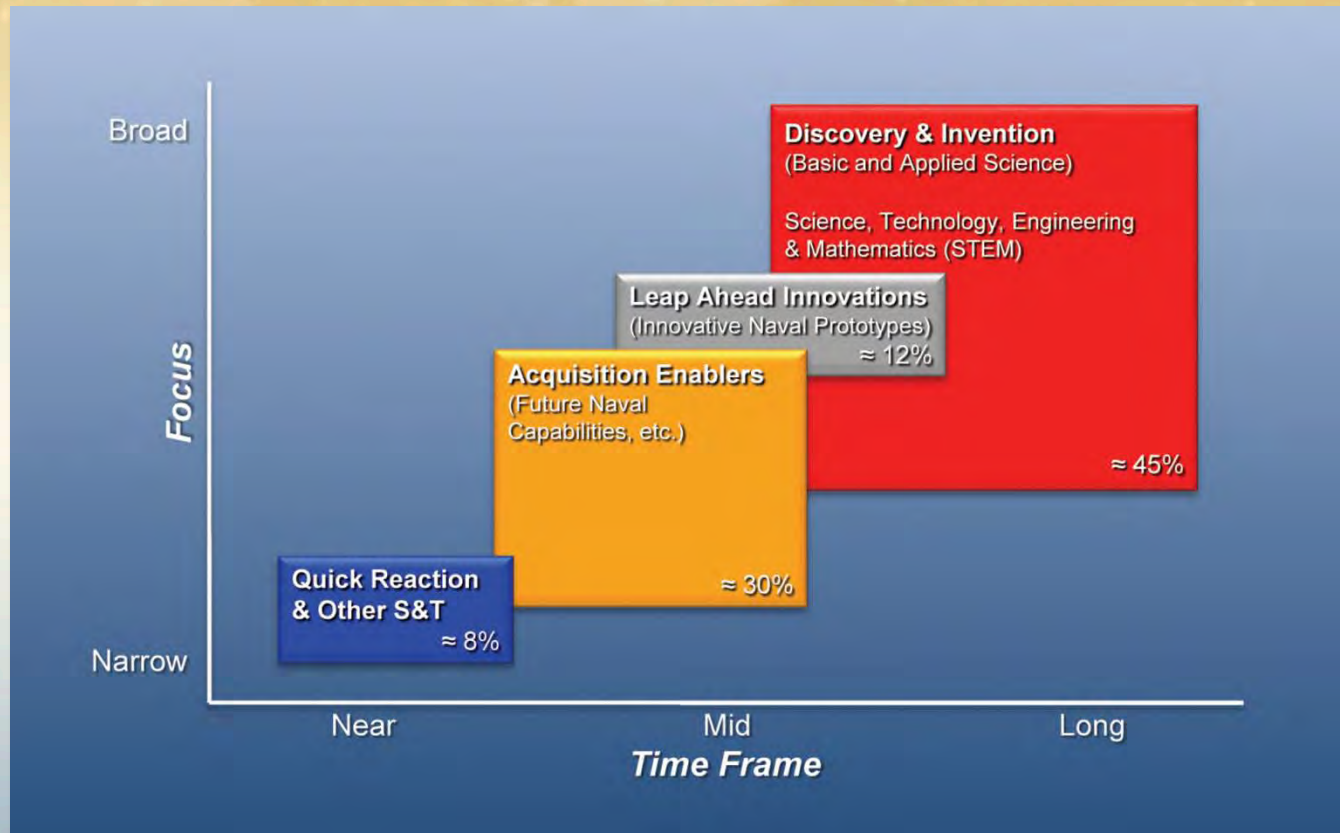


Naval S&T Focus Areas



STEM is a critical enabler across all Focus Areas

ONR S&T Investment Portfolio



Quick Reaction S&T

- Tech Solutions
- Experimentation
- All MCWL, %JNLW 6.3
- % Code 30 6.3
- RTT, UUNS Response

Acquisition Enablers

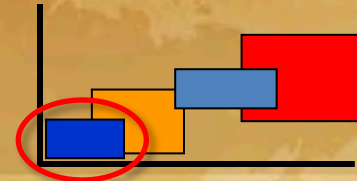
- Future Naval Capabilities
- Warfighter Protection
- Capable Manpower
- % LO/CLO
- % Code 30 6.3 /JNLW 6.3

Leap-ahead Innovations

- Innovative Naval Prototypes
- % SwampWorks

Discovery & Invention

- Basic & Early Applied Research
- National Naval Responsibilities
- Education Outreach HBCU/MI



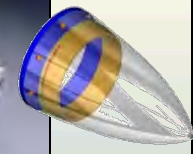
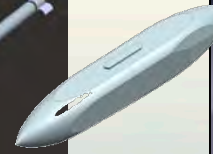
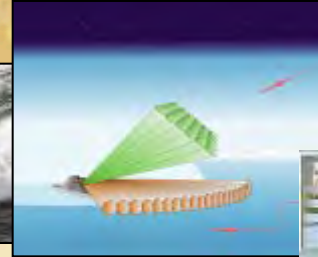
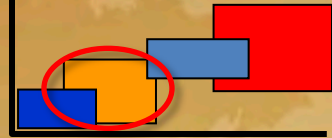

- Ship Identification
- Solid State Lighting
- HCO Trainer
- Food Service Software
- Automated Weather Prediction system



- Rapid solutions to problems identified by deckplate Sailors and Marines
- 1 year turnaround time
- Video: www.youtube.com/usnavyresearch
- Requests submitted online www.onr.navy.mil/techsolutions

Future Naval Capabilities

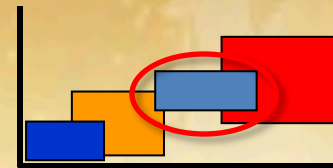
(3-5 Year) Component Technologies



Innovative Naval Prototypes

(5-10 Year) Disruptive Technologies

- High Risk / High Payoff
- Innovative and game-changing
- Approved by Corporate Board
- Delivers prototype



Tactical Satellite



EM Railgun



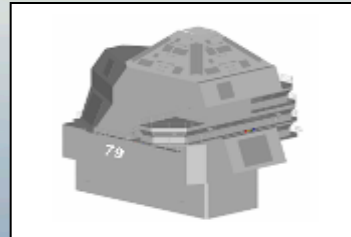
Persistent Littoral Undersea Surveillance



Sea Base Enablers



Free Electron Laser



Integrated Topside



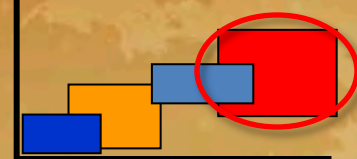
Large Displacement UUV



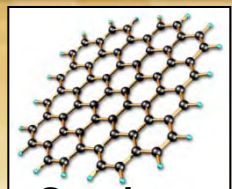
AACUS

Basic Research

Seed corn for disruptive technologies



- Diverse portfolio
- Fosters innovation
- Long-term
- Investment in people
*60+ Nobel laureates



Graphene



1st U.S. Intel satellite
GRAB



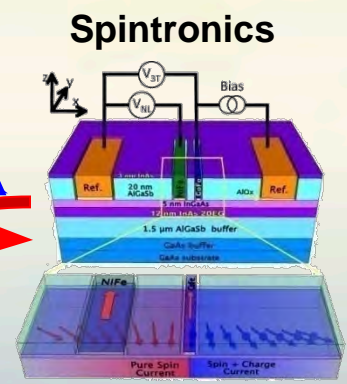
Semiconductors
GaAs, GaN, SiC



EW



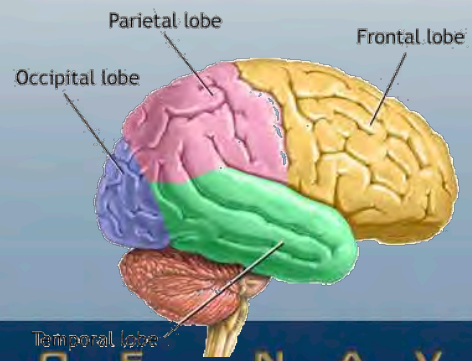
Arctic Research



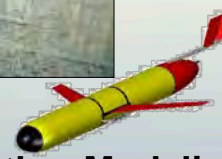
Spintronics



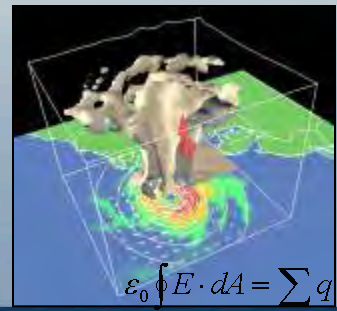
GPS



Parietal lobe Frontal lobe
Occipital lobe Temporal lobe



Weather Modeling



$$\epsilon_0 \oint E \cdot dA = \sum q$$

Laser Cooling



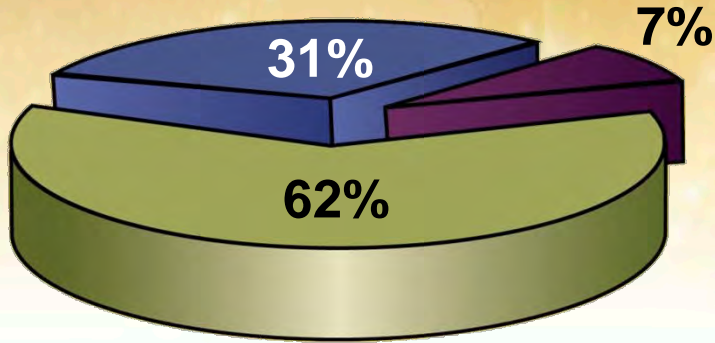
How We Execute



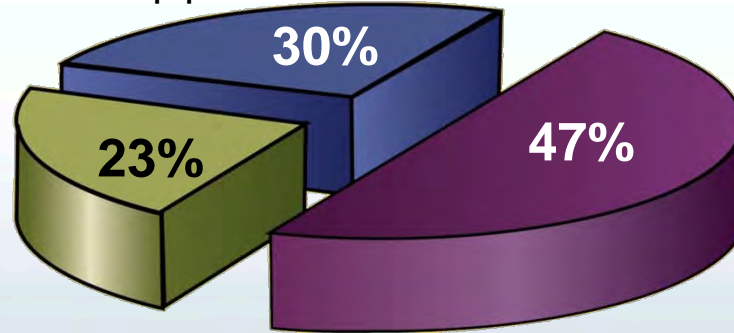
- 70 Countries
- 50 States
- 1,078 Companies
 - 859 small businesses
- 1,035 Universities & Nonprofit Entities
 - 3,340 principal investigators
 - 3,000 grad students

Investment Balance

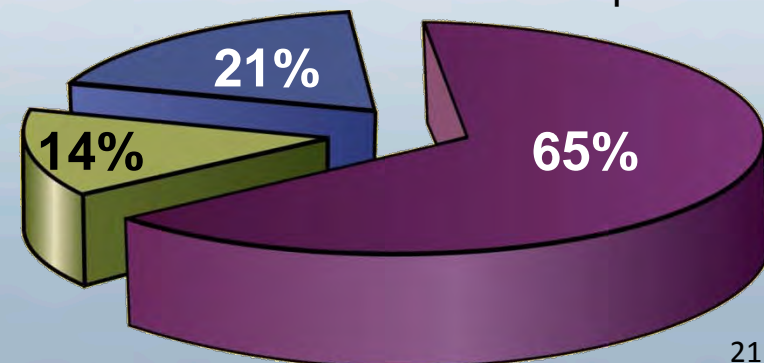
6.1: Basic Research



6.2: Applied Research



6.3: Advanced Tech Development



Requirements Driven Process

I have a
Need!

REQUIREMENT

I have an
Idea!



CAPABILITY

Innovation Driven Process

I have an
Idea!

CAPABILITY

That's a
Good Idea!



Communicating Success

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Navy Crowdsources Pirate Fight To Online Gamers » MMOWGLI Gameplay



Innovation on **msnbc.com**

Navy raygun disables boat with new high energy laser

Maritime Laser Demonstrator could one day protect military vessels

FILED UNDER: *News, Gadgets*
Navy SEALs getting fancy LCD sunglasses, will surely show up as DLC in next SOCOM game
 By Tim Deaven | posted Jan 24th 2012 10:11 PM

FOX NEWS .com
 Fair & Balanced

ON AIR NOW: America Live Host Megyn Kelly

Home Video Politics U.S. Opinion Entertainment

bottech home Archaeology Dinosaurs Planet Earth Wild Nature Air

MILITARY TECH

The Washington Post

In the News BET Awards Asteroid L.A. Dodgers Michele Bachmann Wimbledon Ar

Marines Going Green to Save Lives on Battlefield

Navy Sets World Record With Incredible, Sci-Fi Weapon

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GADGETS **CAR**

GALLERIES ||| VIDEOS ||| COLUM

IEEE
 Advancing Technology for Humanity

DANGER ROOM

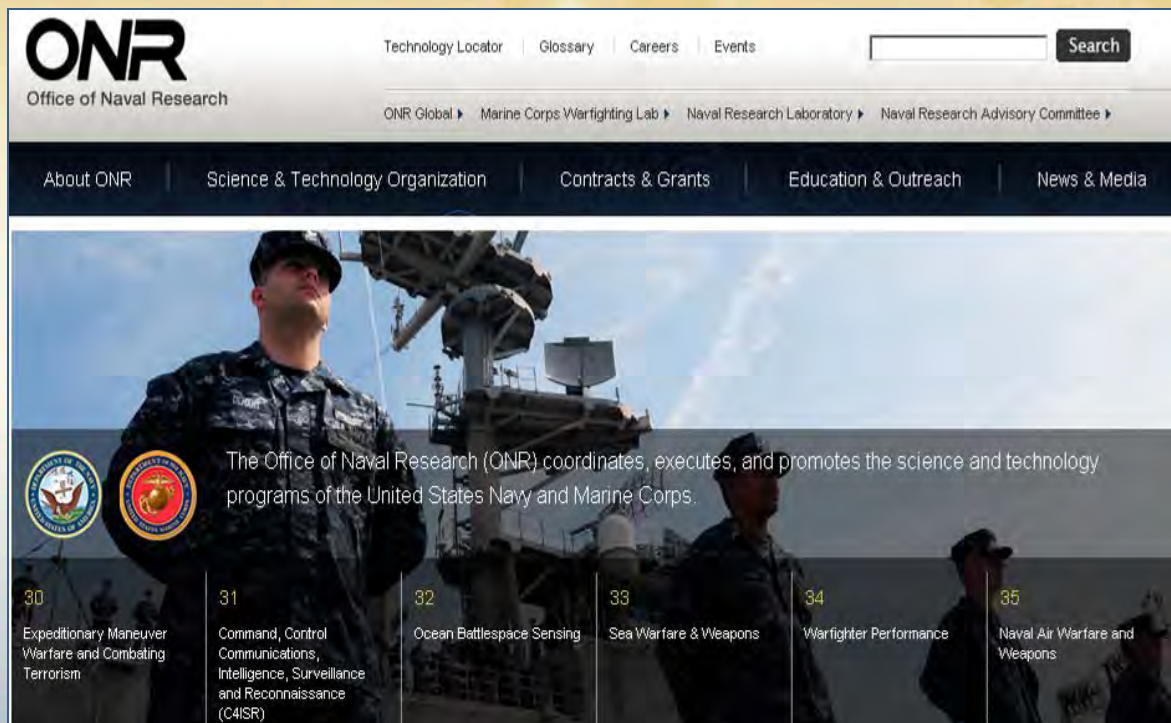
70 Days at Sea For New Robot Sub

FACEBOOK DIGG STUMBLEUPON REDDIT

The Navy's Free Electron Laser System Will be More Than Just a Death Ray

Navy's Patent Portfolio #1 in World Among Government Organizations

Where to Find Us Online



www.onr.navy.mil



Broadcast Yourself™



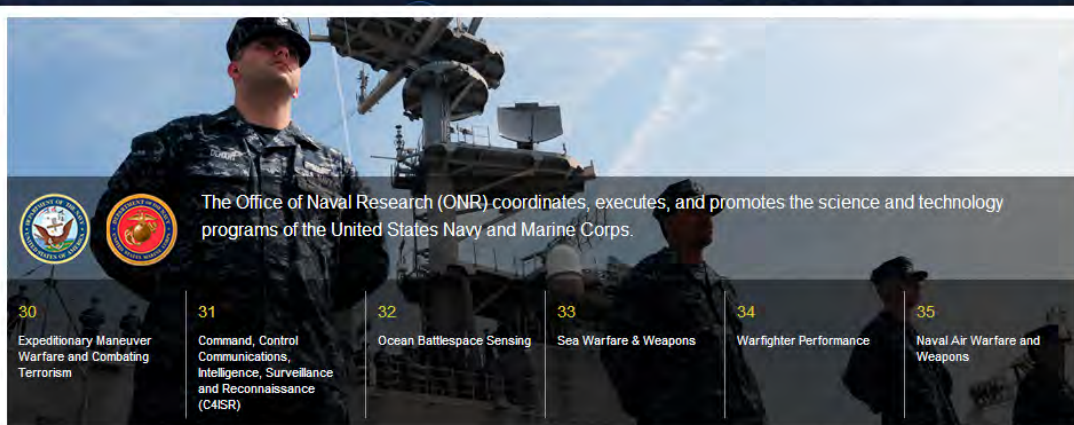


Office of Naval Research

Technology Locator | Glossary | Careers | Events

ONR Global | Marine Corps Warfighting Lab | Naval Research Laboratory | Naval Research Advisory Committee

About ONR | Science & Technology Organization | Contracts & Grants | Education & Outreach | News & Media



The Office of Naval Research (ONR) coordinates, executes, and promotes the science and technology programs of the United States Navy and Marine Corps.

- 30 Expeditionary Maneuver Warfare and Combating Terrorism
- 31 Command, Control Communications, Intelligence, Surveillance and Reconnaissance (C4ISR)
- 32 Ocean Battlespace Sensing
- 33 Sea Warfare & Weapons
- 34 Warfighter Performance
- 35 Naval Air Warfare and Weapons

Directorates

ONR's directorates balance a robust science and technology (S&T) portfolio, allocating funds to meet the warfighter's requirements.

- 03I Innovation
- 03R Research (Discovery & Invention)
- 03T Transition

Chief of Naval Research Spotlight



University (left), will receive a \$100,000 research grant for basic research which could significantly contribute to building future naval forces.

"ONR program officers reviewed the entries and selected 10 very promising ideas from nearly 100 white papers," said Rear Adm. Nevin Carr, chief of naval research. "As always, final selection was tough, but the winners were ultimately chosen based on potential and how well the idea supports the needs of the Navy."

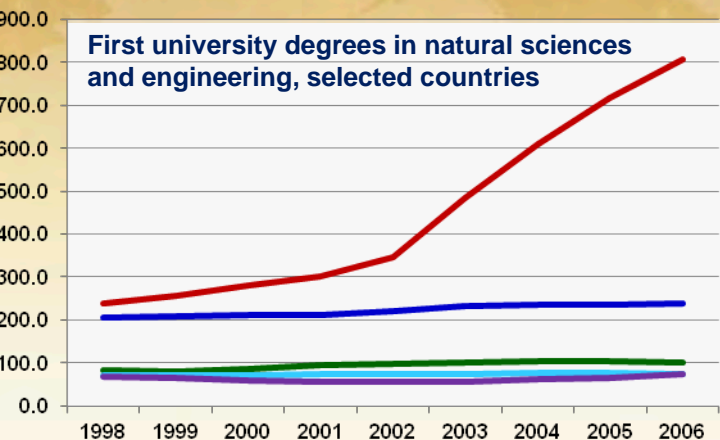
Quick Links

Get shortcuts to commonly requested topics below:

- ONR Wins Website of the Year
- Explore research funding opportunities
- Learn how to submit a proposal
- Follow ONR on Facebook

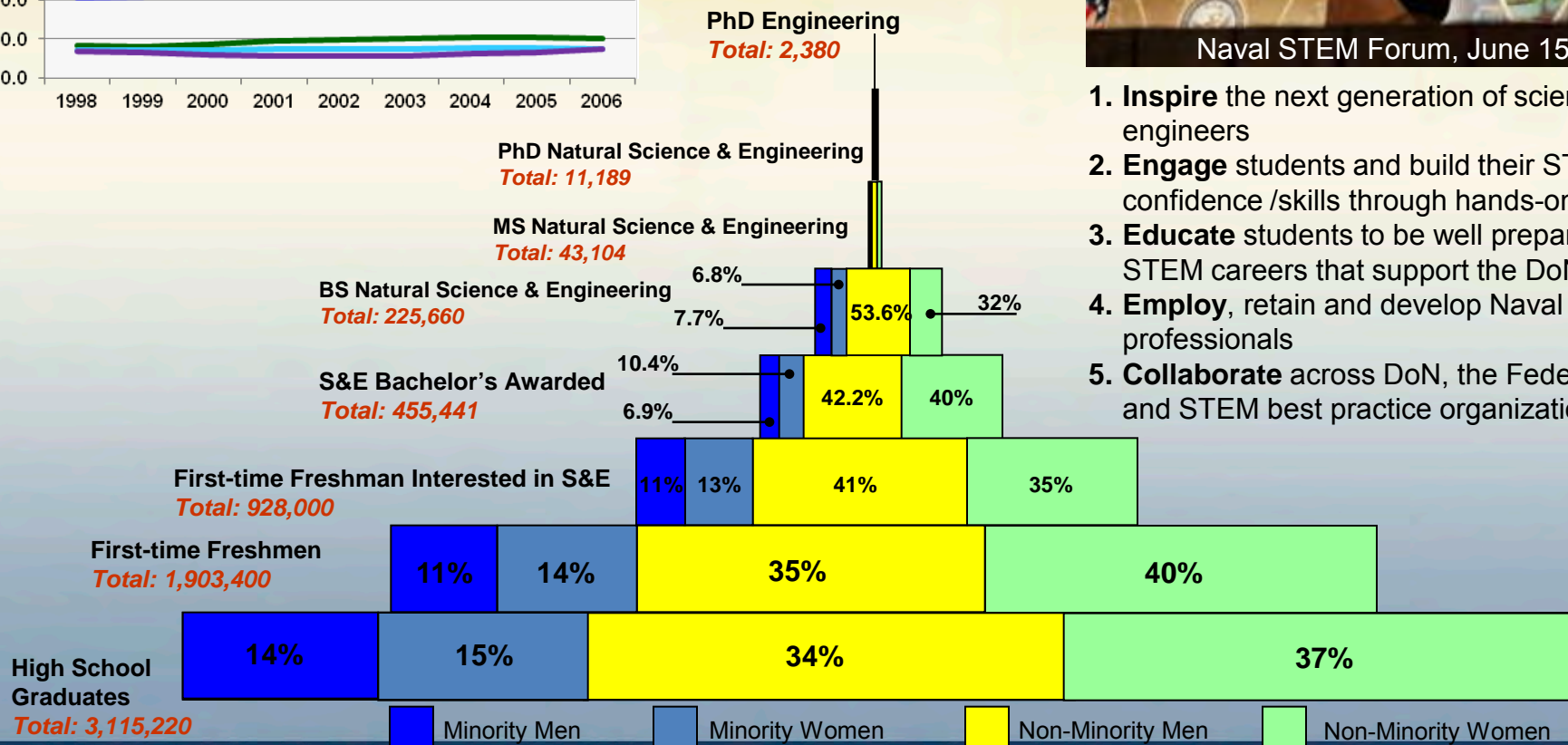
BACK UP

STEM



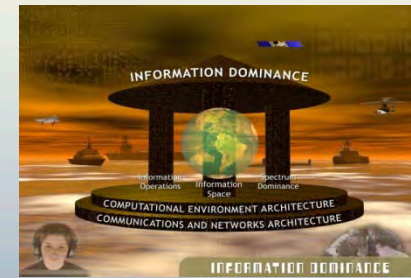
Naval STEM Forum, June 15-16 2011

- 1. Inspire** the next generation of scientists and engineers
- 2. Engage** students and build their STEM confidence /skills through hands-on learning
- 3. Educate** students to be well prepared for STEM careers that support the DoN
- 4. Employ**, retain and develop Naval STEM professionals
- 5. Collaborate** across DoN, the Federal gov'n't and STEM best practice organizations.



Technology Themes

- Power & Energy
- Directed Energy & Hypersonics
- Information Dominance
- Autonomous Systems
- Total Ownership Cost Reduction
- Expeditionary & Irregular Warfare
- Naval Warfighter Performance



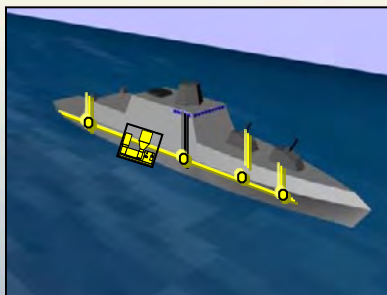
Power & Energy

SECNAV Energy Goals:

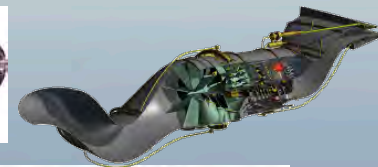
1. Sail a "Green Strike Group" by 2016
2. 50% of Navy energy from alternative sources by 2020
3. Demonstrate a Green Strike Group in by 2012 and sail it by 2016
4. reduce petroleum use in the commercial fleet 50% by 2015
5. Evaluation of energy factors will be mandatory when awarding contracts



ONR Naval Energy Forum
14-15 October 2009

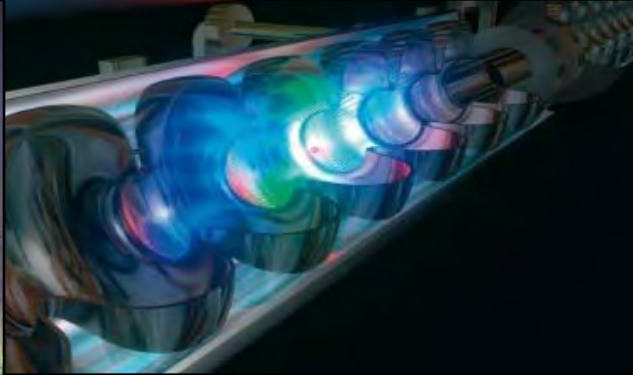
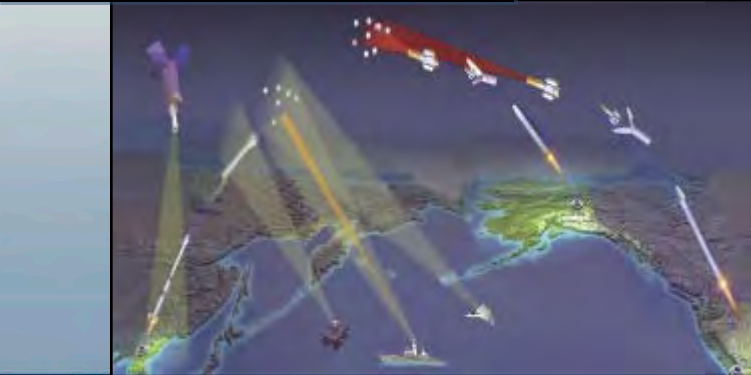


- Fuels
- Power Generation
- Energy Storage
- Efficient Distribution
- Energy Usage



Directed Energy & Hypersonics

- Fight at Hypervelocity & Speed of Light
- Deepen the Magazines
- Increase Depth of Fire
- Broad Range of Missions



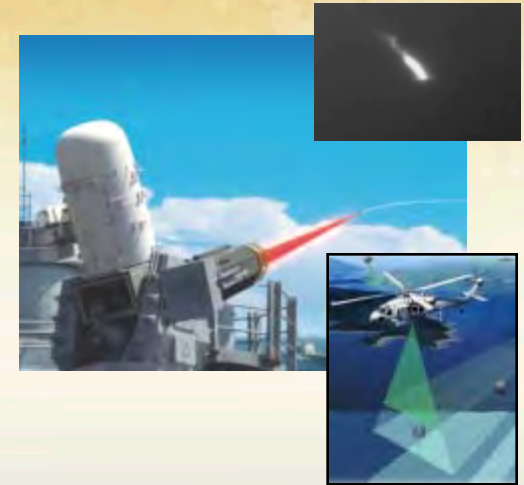
Directed Energy

Blur The Lines Between Sensors & Weapons

Maritime Laser Demonstration (MLD)



Laser Weapon System (LAWS)



Free Electron Laser (FEL)



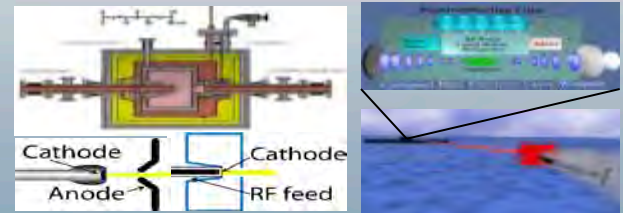
US Naval Academy



Platform vibration and jitter control

Officer Involvement and Training

Naval Postgraduate School



FEL Modeling and Simulation, Quarter Wave-Superconducting RF Injector, Beam Control and Shipboard Integration Concepts

EM Railgun

Blur The Lines Between Missiles & Bullets



32MJ Shot from the Lab Launcher



General Atomics Blitzler



Rapid Pulsed Power Module



BAE Composite Prototype



Projectile Dispense Test

Muzzle energy:

- From 6MJ to 32MJ
- 50-100nm range capability

Pulsed Power:

- 2.5X increase in energy density
- Multi-shot capable design

Bore Life:

- From 10s to 100s
- Multiple configurations & materials

Industry Launcher Prototypes:

- From concept to hardware

Projectile:

- From slugs & sand catch
- To instrumented and dispensing flight bodies on open range

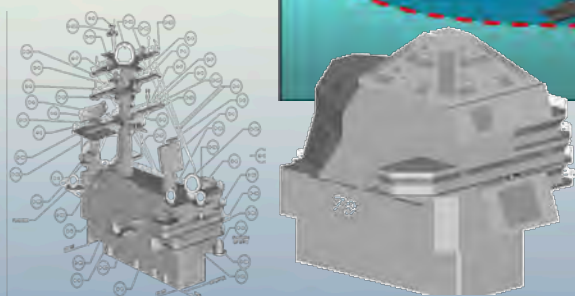
Mission:

- From Land Attack
- To Multi-Mission Initiative

Information Dominance

- Extend the frequency range and effectiveness of Nulka and SEWIP transmitter

- Achieve synchronized wide area EM spectrum control across multiple mission areas using multiple assets

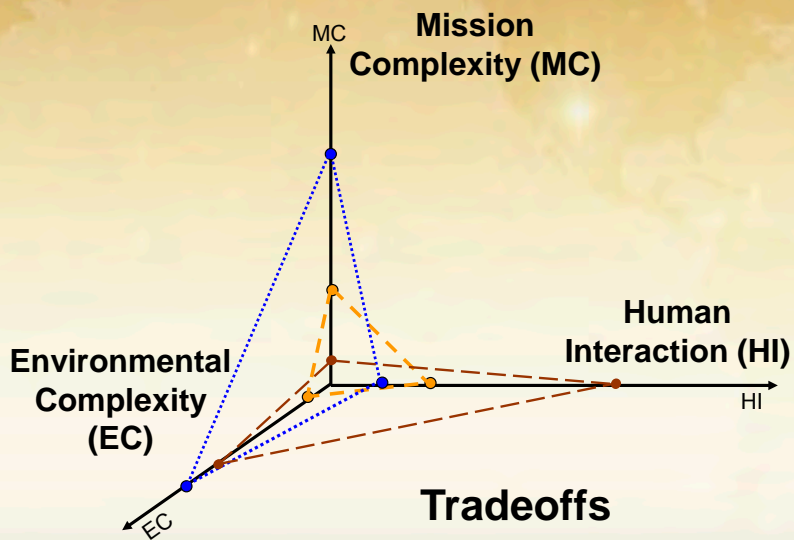


Integrated Topside

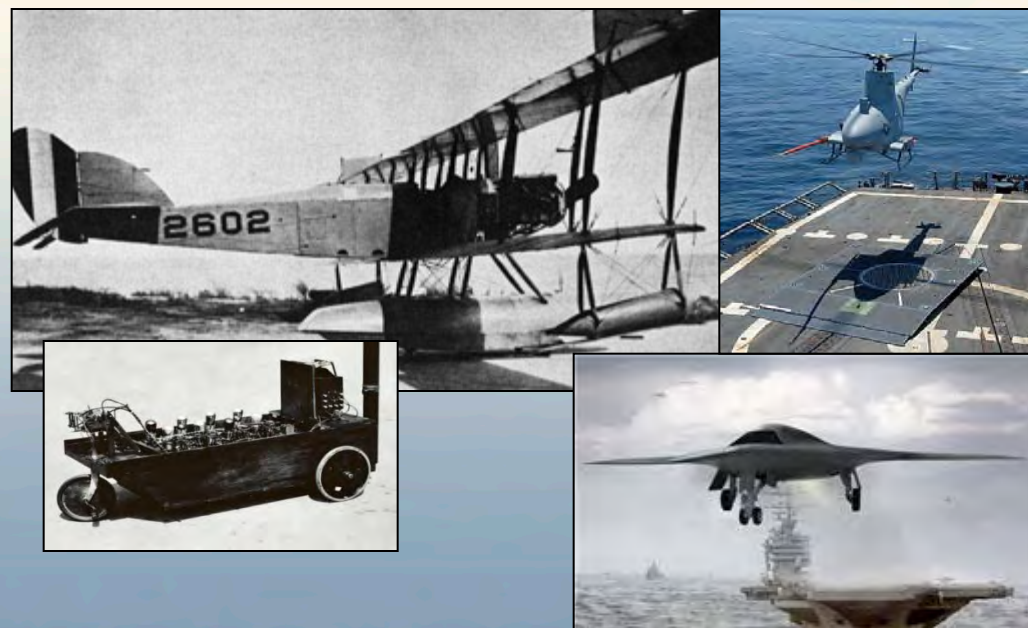
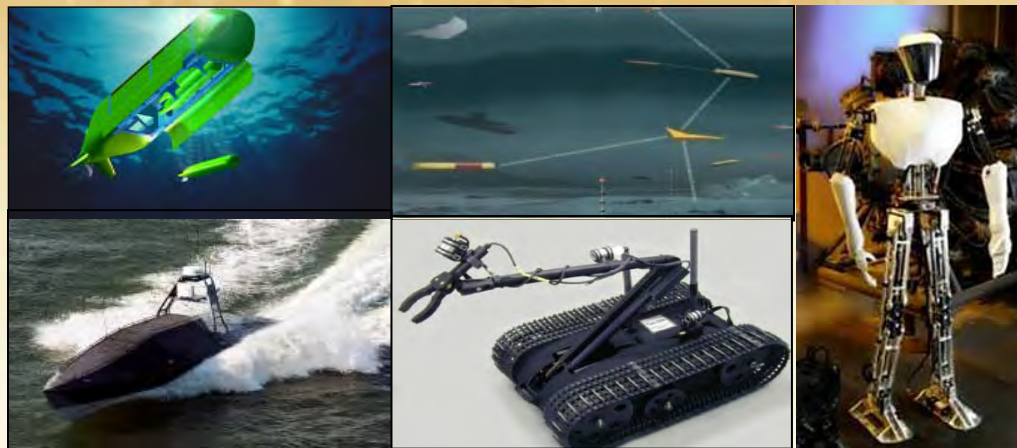


- Simultaneously share RF functions, apertures and signal processing
- Continually optimized to meet Commander's highest priority need

Autonomy

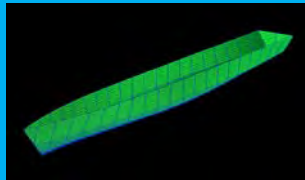


- **Changes everything**
 - Tactics to strategy
- **Hybrid force with manned systems**
- **Power & Energy implications**
- **Mission CONOPS development**
- **Nanoscale Computing**



Total Ownership Cost

Design



10%

Acquisition

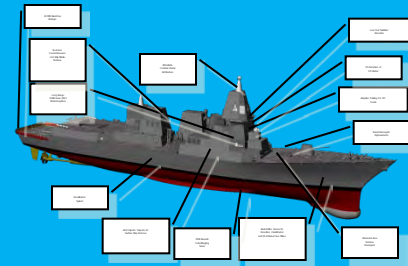


20-30%

Operations & Support



Modernization



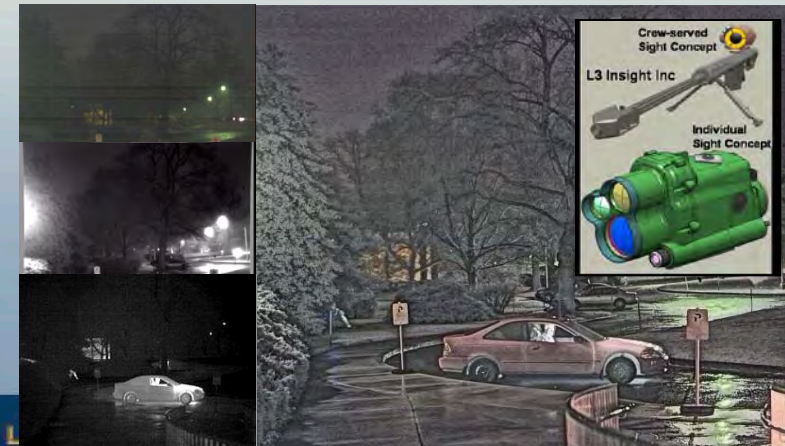
60-70%

Disposal



Expeditionary & Irregular Warfare

- Operational Adaptation
- Physical & Mental Resilience
- Mobile Communications
- Social Cultural Sciences
- Warfighter Protection



Naval Warfighter Performance

Human Systems Integration

- Manpower & Personnel Management
- Training
- User-Centered Design
- C2 Decision Support
- Human, Social, Cultural Sciences
- Safety / Hearing



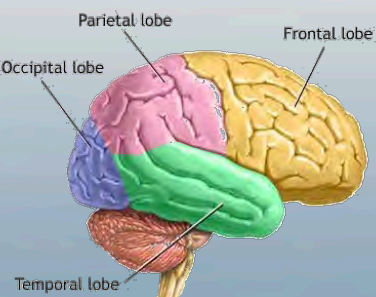
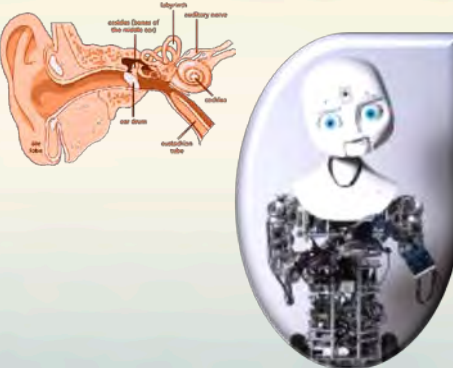
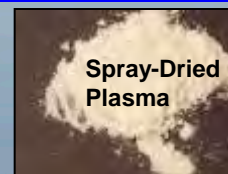
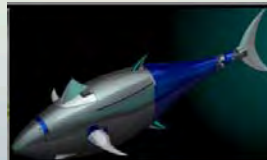
Bio-Engineered Systems

- Marine Mammal Health
- Bio-Sensors / Materials
- Microbial Fuel Cells
- Bio Robotics
- Human-Autonomy Systems



Undersea & Expeditionary Medicine

- Undersea Medicine (NMR)
- Point of Injury Care
 - "Lighten the Load"
 - Treat hemorrhagic shock
- Automated Medical Care
 - CASEVAC / Patient Movement





3x Code Division Missions

Code 30

Expeditionary Warfare & Combating Terrorism

Division 301: *Research Mission:* Basic, applied research in CIED, C4, ISR, Logistics, Human Performance, mobility, lethality, survivability, and ground based Autonomy.

Division 302: *Applications Mission:* Develop technology related to Research Thrust Areas and transition to R&D addressing warfighting capability gaps and opportunities.

Division 303: *Combating Terrorism & Enterprise Integration Mission:* Analysis, concept definition, and integrated tech demonstration in expeditionary and hybrid irregular warfare, confronting irregular challenges, combating terrorism, the middle-weight force, mission command.

Code 31

C4ISR

Division 311: *Mathematical, Computer, and Information Sciences, Mission:* new research in computation, information processing and assurance, cyber security, command and control and accurate decision making in a network centric environment.

Division 312: *Electronic Sensors and Networks, Mission:* address needs in surface and aerospace surveillance, communications, electronic warfare and navigation.

Division 313: *C4ISR, Mission:* advanced research in surface and aerospace surveillance, communications, precision timekeeping and electronic combat.

Code 32

Ocean Battlespace Sensing

Division 321: *Ocean Sensing and Applications, Mission:* Applied research and systems demonstrations for MCM, ASW and space technology. Programs include maritime sensing, ocean engineering and marine systems, and undersea signal processing.

Division 322: *Ocean Atmosphere and Space, Mission:* Basic and applied research to characterize and predict the ocean/atmosphere/ice environment for naval warfare. Programs improve understanding of the environment, the assimilation of data, and the limits of predictability.

Code 33

Sea Warfare & Weapons

Division 331: *Ship Systems and Engineering, Mission:* research and technology development in the areas of energy, advanced sea platforms, survivability and surface ship hydrodynamics

Division 332: *Naval Materials, Mission:* research in physical sciences and engineering, materials and processing, and environmental quality

Division 333: *Sea Platforms and Weapons, Mission:* enhance afloat warfighting capabilities, reduce ship total ownership costs, and improve undersea weapons

Code 34

Warfighter Performance

Division 341: *Life Sciences Mission:* research in cognitive science, computational neuroscience, bioscience and biomimetic technology, physiology and social/organizational science, training and human factors

Division 342: *Biological and Biomedical, Mission:* research in the survival, health and performance of Navy and Marine Corps personnel during training, and operations

Division 343: *Research Protection Mission:* ensure compliance with Human Research Protection Program (HRPP).

Code 35

Air Warfare & Weapons

Division 351: *Aerospace Science and Research Mission:* develop strike technology to include high-energy lasers, hypersonics, rotorcraft technology, advanced propulsion naval air and surface weaponry, and naval aircraft.

Division 352: *Air Warfare and Naval Weapons Application Mission:* oversee unique or essential applied research projects and advanced technology aligned with current and future naval aviation capability gaps and innovative naval prototypes.

ONR Global Presence Today

ONRG-DC

ONRG Global Liaison Office
CNO Executive Panel
CNO (N2/N6)
FLT CYBERCOM/COMTENTHFLT
CNO(N81)

San Diego

COMTHIRDFLT
COMNAVSURFFOR
CG I MEF
COMFLTASWCOM

Honolulu

USPACOM
COMPACFLT
COMMARFORPAC
COMSUBPAC

Mechanicsburg

NAVSUP

Newport

CNO SSG

Camp LeJeune

CG II MEF

Norfolk

COMUSFLTFORCOM
COMNAVAIRFOR
COMSUBFOR
COMMARFOR
COMNECC
COMNWDC

ONRG-London - ADs

Technical Director
Executive Officer

ONRG-Prague

Naples

COMUSNAVEUR

Bahrain

COMNAVCENT

ONRG-Tokyo - ADs

Yokosuka

C7F


Okinawa

III MEF

ONRG-Singapore - ADs

Commanding Officer

ONRG-Santiago - ADs

 New ONRG Location (Feb 10)

Develop Partnerships

Leverage Global S&T
Advances

Avoid Technology
Surprise



October 23, 1983

THEY CAME IN PEACE





Expeditionary Warfare Conference

EXHIBITION ALPHABETICALLY



BGen Frank Kelley
(703)432-1800



Dialogue





CMC Priorities

- 1) Continue to provide the best trained and equipped Marine units to Afghanistan. This will not change. This remains our top priority!
- 2) Rebalance our Corps, posture it for the future and aggressively experiment with and implement new capabilities and organizations.
- 3) Better educate and train our Marines to succeed in distributed operations and increasingly complex environments.
- 4) Keep faith with our Marines, our Sailors and our families.





Role of the United States Marine Corps



DEPARTMENT OF THE NAVY
HEADQUARTERS UNITED STATES MARINE CORPS
3000 MARINE CORPS BUILDING
WASHINGTON, DC 20350-3000

1000
SIG
SEP 12 2011

MEMORANDUM FOR SECRETARY OF DEFENSE

From: Commandant of the Marine Corps

Subj: ROLE OF THE UNITED STATES MARINE CORPS

Secretary Panetta, as we explore ways across the Department to adjust to a new period of considerable fiscal austerity, there emerges a clear imperative that our Nation retain a credible means of mitigating risk while we draw down the capabilities and capacities of our forces.

Our Nation faces an uncertain future; we cannot predict where and when events may occur that might call us to respond to protect our citizens and our interests. There have always been times when events have compelled the United States to become involved, even when such involvement wasn't desired; there is little doubt that we will have to do this again in the future. Complicating matters is the fact that since the 1990s, our nation has significantly reduced the number and size of our bases and stations around the world.

We are a maritime nation. Like so much of the world, we rely on the maritime commons for the exchange of commerce and ideas. Many depend on us to maintain freedom of movement on those commons; we continue to take that responsibility seriously. Your naval forces are the solution set to fulfilling our global maritime responsibilities.

Naval forces are not reliant on host nation support or permission; in the conduct of operations, they step lightly on our allies and host countries. With the increasing concentration of the world's population close to a coastline, the ability to operate simultaneously on the sea, ashore, and in the air, and to move seamlessly between these three domains represents the unique value of amphibious forces. Operating as a team, amphibious forces provide *operational reach* and *agility*, they "*buy time*" and *decision space* for our national leaders in time of crisis. They bolster diplomatic initiatives by means of their credible forward presence. Amphibious forces also provide the Nation with assured access for the joint force in a major contingency operation. Modern amphibious operations, like the TF-58 assault that seized Kandahar airport 450 miles inland in 2001 shortly after the 9/11 attacks, seek to avoid enemy strengths by exploiting gaps and weaknesses.

When the Nation pays the 'sticker price' for its Marines, it buys the ability to remain forward deployed and forward engaged to assure our partners, reinforce alliances, and build partner capacity. For 7.8% of the total DoD budget, our Nation gains the ability to respond to unexpected crises, from humanitarian disaster relief efforts, to non-combatant evacuation operations, to conduct counter-piracy operations, raids or strikes. That same force can quickly be reinforced to assure access anywhere in the world in the event of a major contingency; it can be dialed up or down like a rheostat to be relevant across the range of military operations. No



F-35 / ACV

JSF Resumes Flight Operations

BACKGROUND

On August 3, 2011 the F-35 Joint Program Office issued a fleet wide precautionary suspension of ground and flight operations as a result of an incident involving the F-35 conventional takeoff and landing (CTOL) variant AF-4 at Edwards AFB, Calif. The JSF fleet resumed monitored ground test operations on August 10 and returned to monitored flight operations on August 18.

The government test flight operations were made after reviewing data from monitoring procedures governing monitoring of valve position is a safety. The root cause investigation is a monitoring of valve position is a safety. Monitoring is in the works.

TALKING POINTS

- The F-35B will revolutionize environments while reducing enabling joint interoperability
- STOVL JSF enables distributed high sortie generation, small
- The STOVL technical challenge none of the currently known
- The capability inherent in a S our need for close air support Marine Corps will likely appear

QUESTIONS AND ANSWERS

Q1: What advantages do you gain from the STOVL variant? A1: The STOVL variant will provide a 3,000 to 4,000 fold exponential increase in the number of air support assets. It will replace damaged facilities and create 22 TACAIR-capable carrier conventional carriers.

POINT OF CONTACT/SOURCING: Mr. Joe Della Vedova, JSF JPO P, Capt. Brian Block, HQMC DivPA.

Current As of

STOVL JSF SHIPBOARD TESTING

"Keeping the Marine Corps on target" IN THE BLACK

May 18, 2011

Headquarters U.S. Marine Corps

Modernization: Joint Strike Fighter

Background

- The F-35 Lightning II, or Joint Strike Fighter (JSF), is a multi-role, multinational fifth-generation fighter that combines low observable technology with agile close air support capability to create a multimission platform. It gives pilots unprecedented situational awareness and unmatched lethality and survivability.
- The single-engine, single-seat F-35 will be manufactured in three versions: a short takeoff/vertical landing (STOVL, F-35B) variant for the Marine Corps; an aircraft-carrier version (CV, F-35C) for the Navy; and a conventional takeoff-and-landing (CTOL, F-35A) variant for the Air Force.
- The Marine Corps will replace the aging AV-8B Harriers, F/A-18 Hornets, and EA-6B Prowlers with 420 Joint Strike Fighters – a mix of 340 F-35 B models and 80 F-35 C models.
- The first F-35B squadron will stand up in 2012, the first F-35C squadron will stand up in 2016, and three legacy squadrons will begin transitioning in 2013 and end in 2026, culminating in 21 active and three reserve F-35 squadrons.

Discussion

- The F-35B STOVL Joint Strike Fighter remains the tactical aircraft we need to support our Marine Air Ground Task Forces and the nation's capital strike, from the current 11 conventional carriers to our expeditionary capabilities.
- STOVL JSF will double the nation's capital strike, from the current 11 conventional carriers to our expeditionary capabilities.
- STOVL JSF will double the nation's capital strike, from the current 11 conventional carriers to our expeditionary capabilities.
- STOVL JSF will double the nation's capital strike, from the current 11 conventional carriers to our expeditionary capabilities.

Facts & Figures

Key Messages

- The F-35 marks the next generation of tactical aircraft dominance for the Marine Corps.
- The F-35B will revolutionize our expeditionary Marine air-ground combat power in all threat environments, reducing our reliance on supporting aircraft, tankers and jammers while enabling joint interoperability with newer systems.
- The F-35C fulfills the Marine Corps' enduring commitment to our carrier-based naval aircraft heritage and future.

- The Marine Corps plans to purchase 480 F-35B STOVL aircraft and 80 F-35C aircraft for its fleet.
- The Marine Corps plans to have 21 F-35B squadrons and 3 F-35C reserve squadrons of F-35 aircraft.
- STOVL technical challenge developmental stage known issues are well understood.
- The F-35 Joint Strike Fighter program is on track for a successful transition to full-rate production.

Headquarters U.S. Marine Corps

Modernization: Amphibious Combat Vehicle (ACV)

May 18, 2011

Background

- After sustained combat operations in Iraq and Afghanistan, the Marine Corps must reset war-weary equipment and modernize capabilities.
- As part of this process, funding identified for the EFV will be used to address overall modernization needs and to pursue an integrated vehicle program that is affordable.
- Our approach will be to balance capability with cost while mitigating the risks associated with a new vehicle program. This approach will initially examine three integrated efforts:
 - AAV upgrade: A service-life extension program and upgrades for some AAVs
 - ACV: The development of a new Amphibious Combat Vehicle
 - MPC: The procurement of Marine Personnel Carriers

Discussion

- The Marine Corps intends to pursue an aggressive and responsible acquisition timeline for new and upgraded amphibious vehicles. In doing so, the Corps will employ a disciplined systems engineering process coupled with sound cost analysis.
- The Corps is beginning an analysis of alternatives of amphibious combat vehicles that will evaluate cost vs capability of several different ACV configurations.
- This analysis will be informed by input we have received from industry in response to requests for information issued earlier this year.
- The Corps also will conduct a series of war games in collaboration with the Navy to evaluate the operational impacts of closing the ship-to-shore distance from 25 nautical miles to 12 nautical miles while also reducing the water speed of the ACV.

Key Messages

- As America's Expeditionary Force in Readiness, the Marine Corps must be prepared to respond to crises in any climate or place.
- An amphibious combat vehicle is critical in enabling the Marine Corps to conduct ship-to-shore operations in permissive, uncertain or hostile environments.
- The Corps is committed to developing and fielding an effective, survivable and affordable amphibious combat vehicle that meets our requirements.

Facts & Figures

- The vitality of an amphibious fleet is critical to overcoming anti-access challenges in locations along coastlines or in strategic straits where no U.S. forces are present and/or basing agreements in place.
- The United States since 1990 has conducted some 110 amphibious operations. For example, the Navy-Marine Corps team has been on the scene in Bangladesh (1981), the Philippines (1981), Liberia (1981), the Philippines (2010), and East Timor (2002).

Reviewing Amphibious Capability

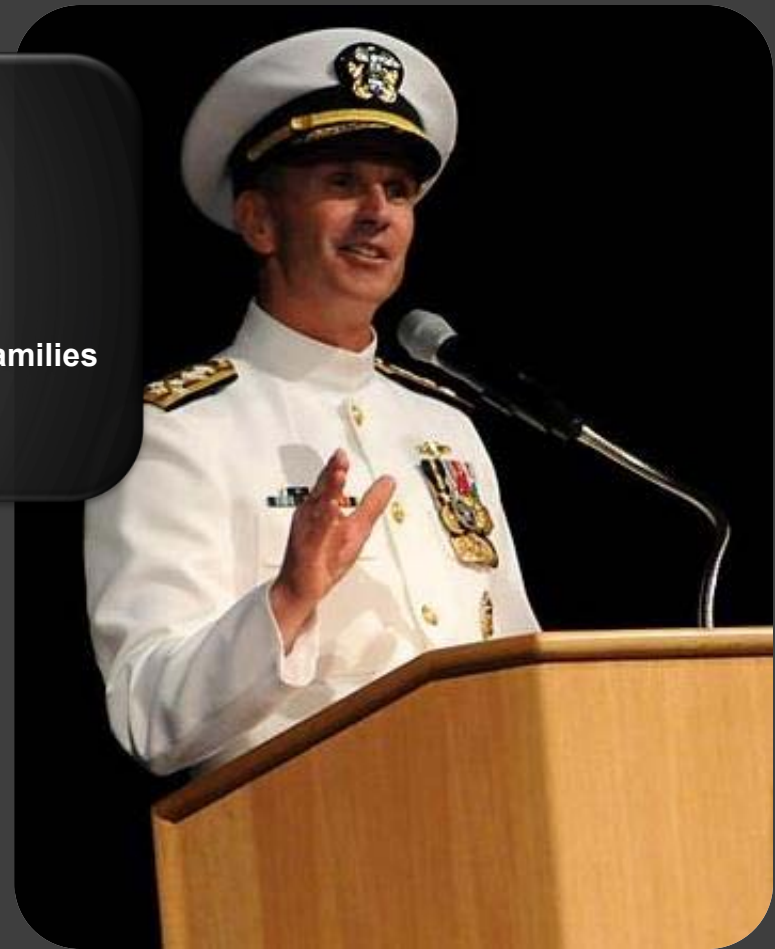
"Like an affordable insurance policy, Marine Corps and Navy amphibious forces represent a very efficient and effective hedge against the nation's most likely risks." – CMC, Role of the United States Marine Corps, 12 Sep memo to SECDEF

"Keeping the Marine Corps on target" IN THE BLACK



CNO Priorities

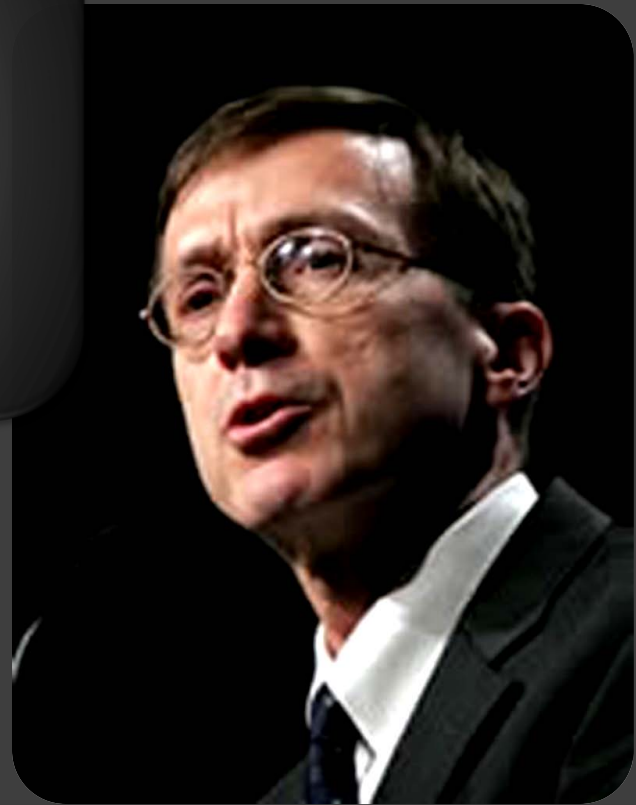
- 1) Remain ready to meet current challenges, today
- 2) Build a relevant and capable future force
- 3) Take care of our Sailors, Navy Civilians and their Families





ASN RDA Priorities

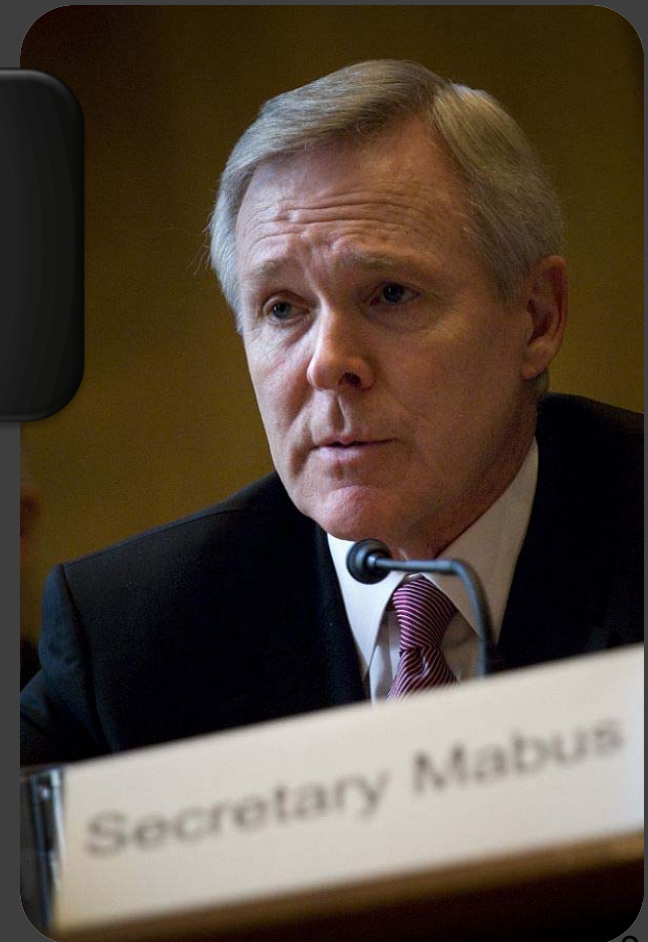
- 1) Getting the requirements right
- 2) Making every dollar count
- 3) Performing to plan
- 4) Minding the health of the industrial base
- 5) Strengthening the acquisition workforce





SECNAV

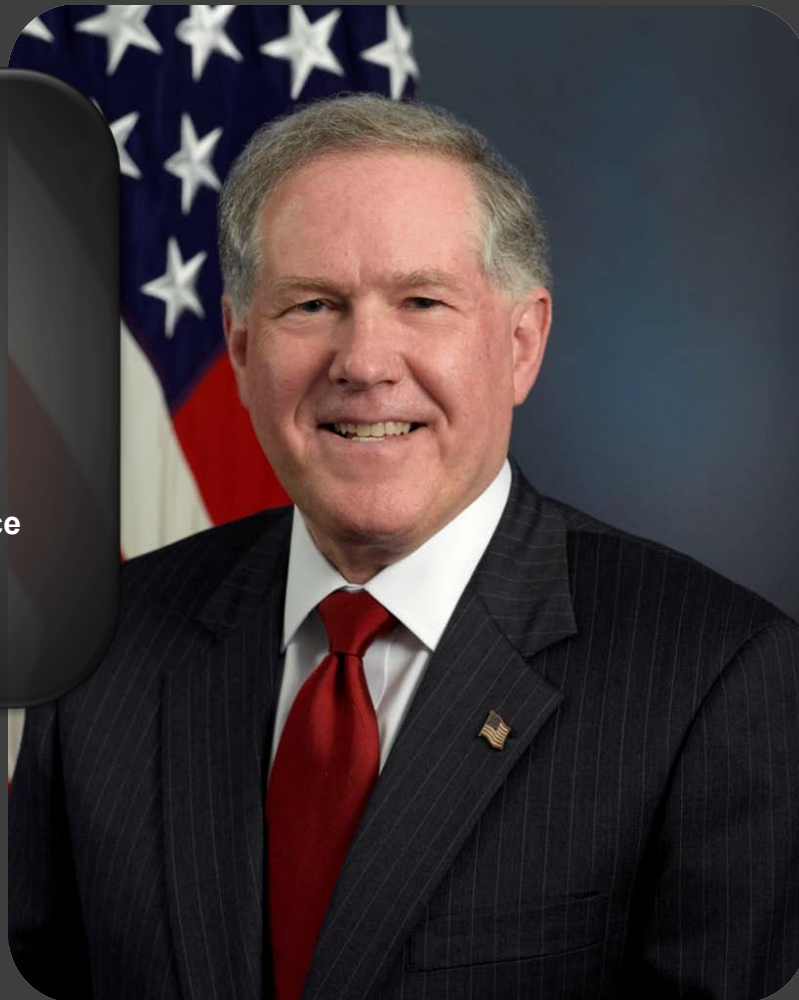
- 1) Taking care of Sailors, Marines, Civilians and their families
- 2) Treating Navy energy requirements and solutions as issues of national security
- 3) Creating acquisition excellence
- 4) Optimizing unmanned systems





AT&L Priorities

- 1) Supporting forces who are engaged in overseas Contingency Operations
- 2) Achieving affordable programs
- 3) Improving efficiency
- 4) Strengthening the industrial base
- 5) Strengthening our acquisition workforce
- 6) We must protect the future





Guidance Roadmap

Target Affordability and Control Cost Growth

- Mandate affordability as a requirement
 - At Milestone A set affordability target as a Key Performance Parameter
 - At Milestone B establish engineering trades showing how each key design feature affects the target cost
- Drive productivity growth through Will Cost/Should Cost management
- Eliminate redundancy within warfighter portfolios
- Make production rates economical and hold them stable
- Set shorter program timelines and manage to them

Incentivize Productivity & Innovation in Industry

- Reward contractors for successful supply chain and indirect expense management
- Increase the use of FPIF contract type where appropriate using a 50/50 share line and 120 percent ceiling as a point of departure
- Adjust progress payments to incentivize performance
- Extend the Navy's Preferred Supplier Program to a DoD-wide pilot
- Reinvigorate industry's independent research and development and protect the defense technology base

Promote Real Competition

- Present a competitive strategy at each program milestone
- Remove obstacles to competition
 - Allow reasonable time to bid
 - Require non-certified cost and pricing data on single offers
 - Require open system architectures and set rules for acquisition of technical data rights
- Increase dynamic small business role in defense marketplace competition

Improve Tradecraft in Services Acquisition

- Create a senior manager for acquisition of services in each component, following the Air Force's example
- Adopt uniform taxonomy for different types of services
- Address causes of poor tradecraft in services acquisition
 - Assist users of services to define requirements and prevent creep via requirements templates
 - Assist users of services to conduct market research to support competition and pricing
 - Enhance competition by requiring more frequent re-compete of knowledge-based services
 - Limit the use of time and materials and award fee contracts for services
 - Require that services contracts exceeding \$1B contain cost efficiency objectives
- Increase small business participation in providing services

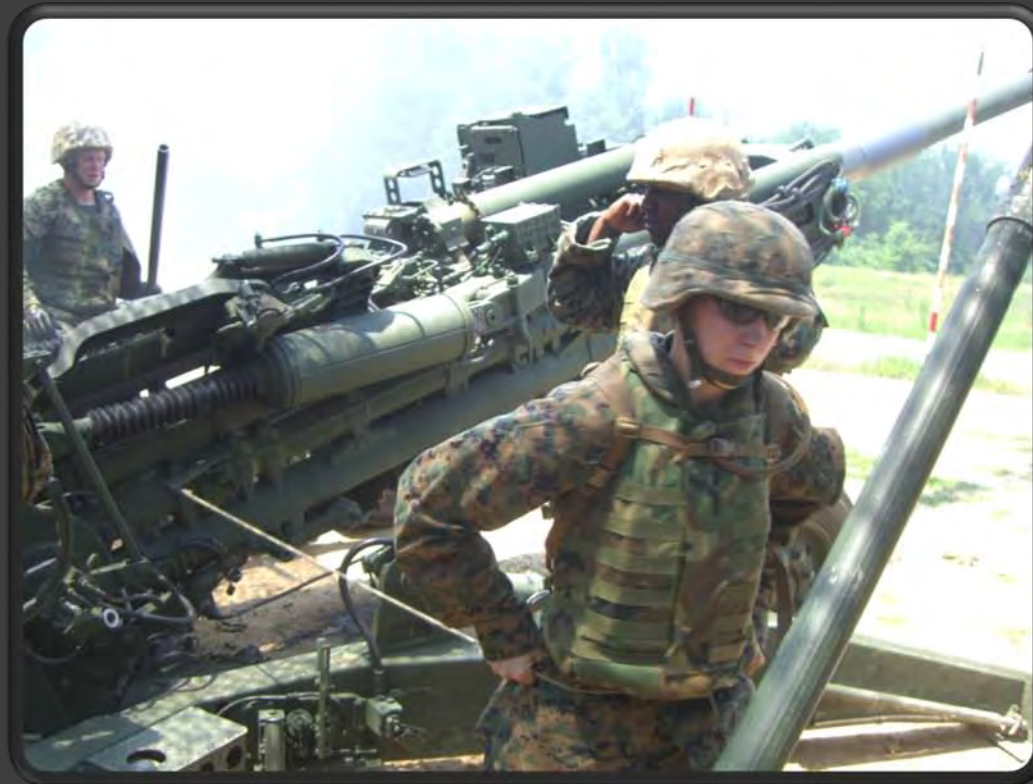
Reduce Non-Productive Processes and Bureaucracy

- Reduce the number of OSD-level reviews to those necessary to support major investment decisions or to uncover and respond to significant program execution issues
- Eliminate low-value-added statutory processes
- Reduce by half the volume and cost of internal and congressional reports
- Reduce non-value-added overhead imposed on industry
- Align DCMA and DCAA processes to ensure work is complementary
- Increase use of Forward Pricing Rate Recommendations (FPRRs) to reduce administrative costs

Sept 14, 2010



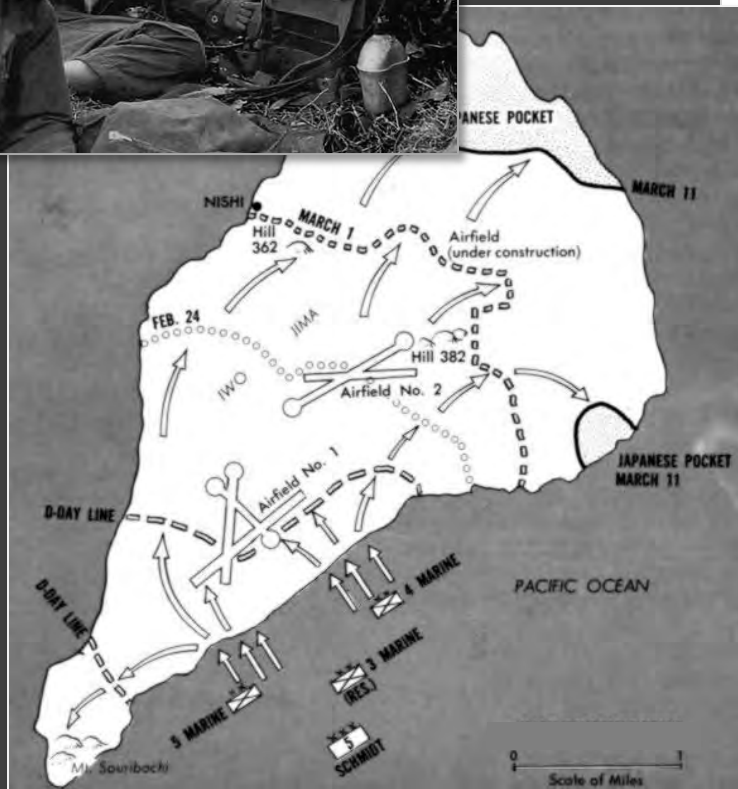
“The Myth of Our Amphibious Roots” Marine Corps Gazette.
THE MYTH OF OUR AMPHIBIOUS ROOTS MARINE CORPS GAZETTE



2dLt Valerie J. Cranmer



Operations Then...





Distributed Operations

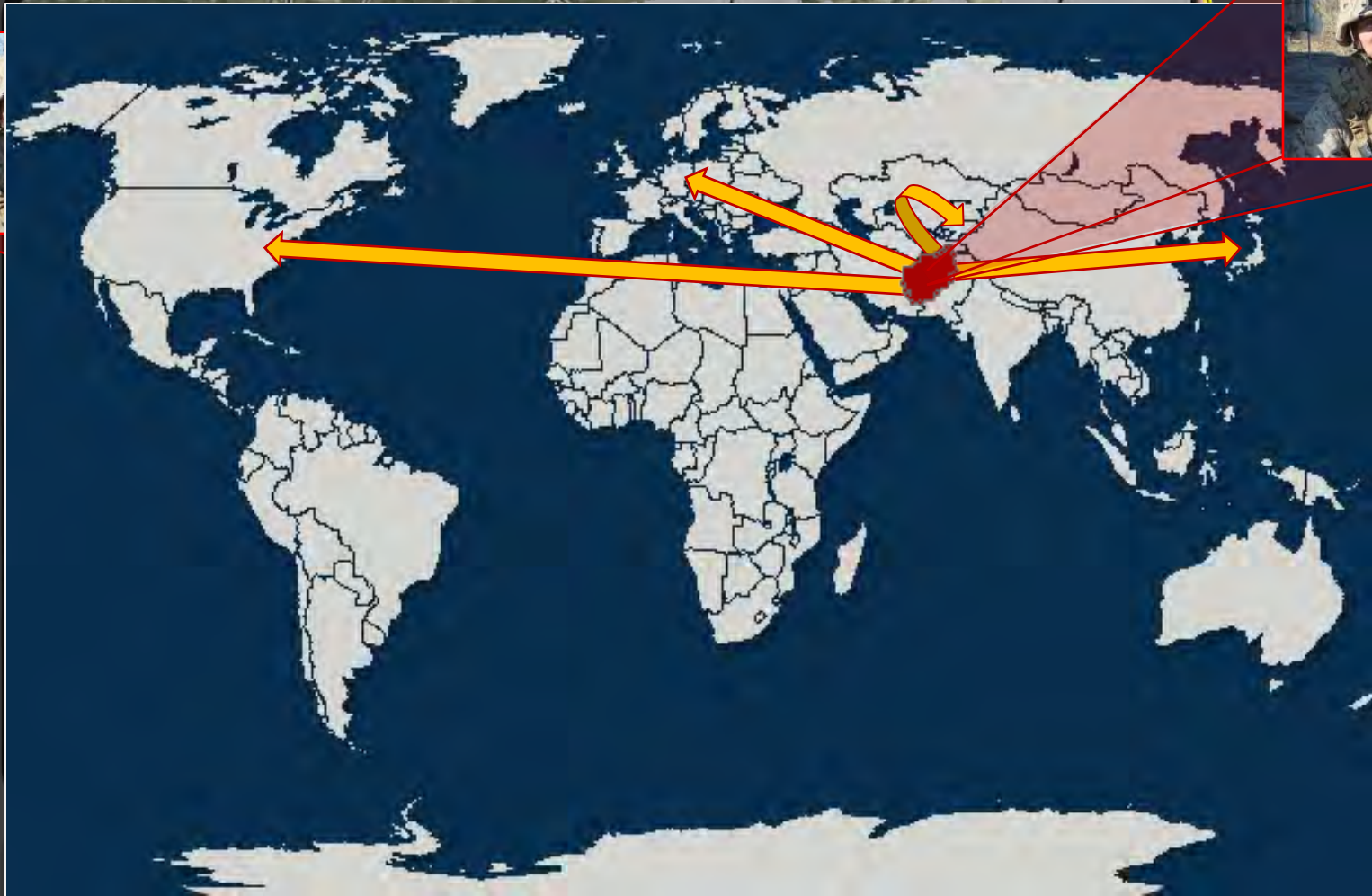


Capt Robert Tavzel



Distributed Operations

DISRUPTED OBELSIORUS





FR Silk Weight
Undershirt
\$17.17
0.37lbs

Protective Under Garment
\$62.99
0.55lbs

Socks, Extreme Weather
\$7.84
0.30lbs

Total Weight

0.37 lbs
0.55 lbs
0.30 lbs

Total Price

\$ 17.17
\$ 62.99
\$ 7.84

~~0.22~~ lbs

\$ ~~80.00~~



Utility Belt
\$1.82
0.25lbs

FR Combat Ensemble
\$77.90
2.44lbs

RAT Boot (Hot Weather)
\$198.00
3.06lbs

Total Weight

- 0.37 lbs
- 0.55 lbs
- 0.30 lbs
- 0.25 lbs
- 2.44 lbs
- 3.06 lbs

~~3.00~~ lbs

Total Price

- \$ 17.17
- \$ 62.99
- \$ 7.84
- \$ 1.82
- \$ 77.90
- \$ 198.00

\$ ~~333.02~~



Plate Carrier w/ SAPI Inserts
\$1340.36
22.4lbs

Protective Over Garment
\$239.20
2.00lbs

Multi-Purpose Bayonet
\$118.90
1.19lbs

Holster
\$128.79
2.10lbs

Total Weight

LOSL AAGIDU

0.37 lbs

0.55 lbs

0.30 lbs

0.25 lbs

2.44 lbs

3.06 lbs

22.4 lbs

2.00 lbs

1.19 lbs

2.10 lbs

Total Price

LOSL FLICE

\$ 17.17

\$ 62.99

\$ 7.84

\$ 1.82

\$ 77.90

\$ 198.00

\$ 1340.36

\$ 239.20

\$ 118.90

\$ 128.79

~~32.17~~ lbs

\$ ~~2018.78~~



MEPS (Goggles)
\$63.81
0.40lbs

LWH w/ reversible cover
\$269.80
4.12lbs

Complete Hydration System
w/ 100 oz. water
\$72.71
10.19lbs

Mid-weight FR Balaclava
\$30.85
0.20lbs

Chest Rig (Not Loaded)
\$42.91
2.40lbs

FR Gloves
\$97.83
0.18lbs

Knee & Elbow pads
\$29.40
1.30lbs

Total Weight

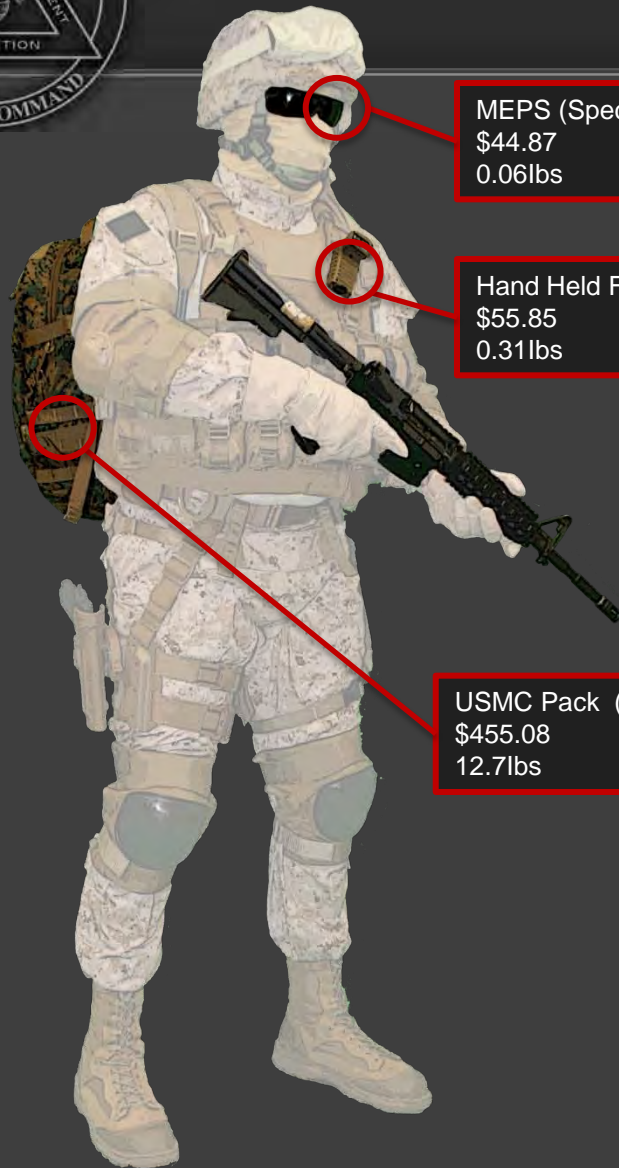
Total Price

0.37 lbs
0.55 lbs
0.30 lbs
0.25 lbs
2.44 lbs
3.06 lbs
22.4 lbs
2.00 lbs
1.19 lbs
2.10 lbs
0.40 lbs
4.12 lbs
0.20 lbs
2.40 lbs
0.18 lbs
1.30 lbs
10.19 lbs

\$ 17.17
\$ 62.99
\$ 7.84
\$ 1.82
\$ 77.90
\$ 198.00
\$ 1340.36
\$ 239.20
\$ 118.90
\$ 128.79
\$ 63.81
\$ 269.80
\$ 30.85
\$ 42.91
\$ 97.83
\$ 29.40
\$ 72.71

~~35.00~~ lbs

~~\$ 2000.58~~



MEPS (Spectacle Kit)
\$44.87
0.06lbs

Hand Held Flash Light
\$55.85
0.31lbs

USMC Pack (Assault load)
\$455.08
12.7lbs

Total Weight

Total Price

0.37 lbs
0.55 lbs
0.30 lbs
0.25 lbs
2.44 lbs
3.06 lbs
22.4 lbs
2.00 lbs
1.19 lbs
2.10 lbs
0.40 lbs
4.12 lbs
0.20 lbs
2.40 lbs
0.18 lbs
1.30 lbs
10.19 lbs
0.06 lbs
0.31 lbs
12.7 lbs

\$ 17.17
\$ 62.99
\$ 7.84
\$ 1.82
\$ 77.90
\$ 198.00
\$ 1340.36
\$ 239.20
\$ 118.90
\$ 128.79
\$ 63.81
\$ 269.80
\$ 30.85
\$ 42.91
\$ 97.83
\$ 29.40
\$ 72.71
\$ 44.87
\$ 55.85
\$ 455.08

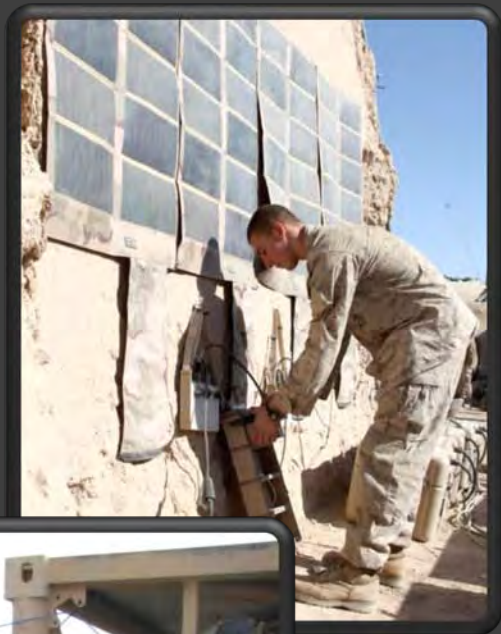
66.88 lbs

\$ 2900.08



Advanced Power Sources

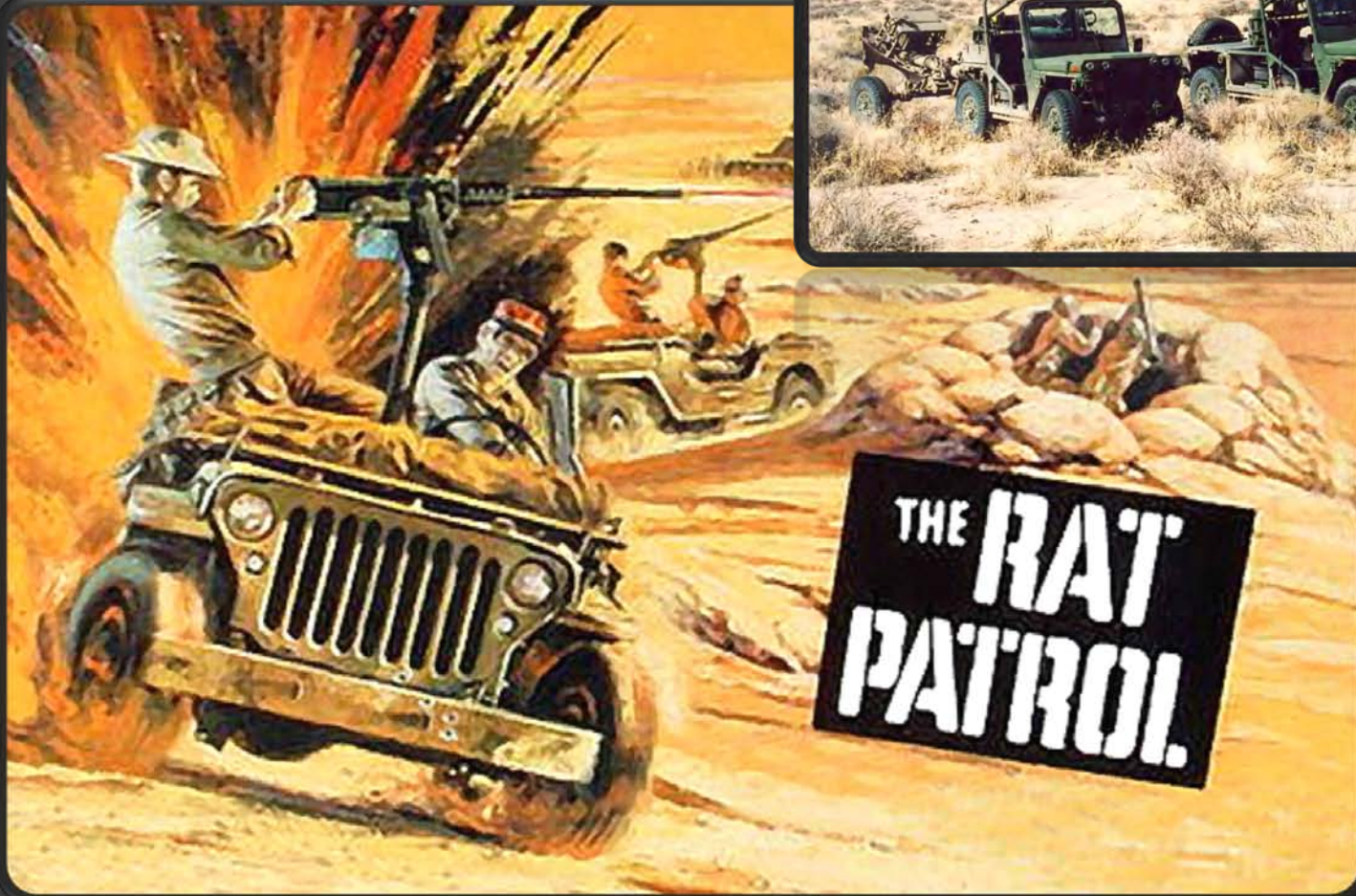
291102 12M09 2011C02





Expeditionary

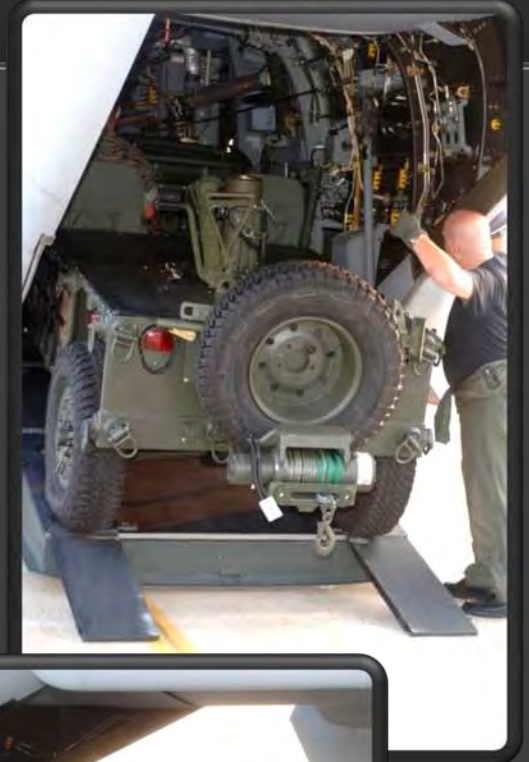
EXHIBITION





ITV & EFSS

11A & EL22





AAV





ITV Cargo Loaded in an AAV





We...
ME...



This is a good news story...

- You, Industry, Understand the environment
- ...so do we
- Together, by being Deliberate, Disciplined, Providing Visibility to each other and Collaborating at every Opportunity
- ...we will solve this





Welcome to Marine Corps Systems Command Quantico, Virginia





MARINE AVIATION

NDIA Expeditionary Warfare Conference

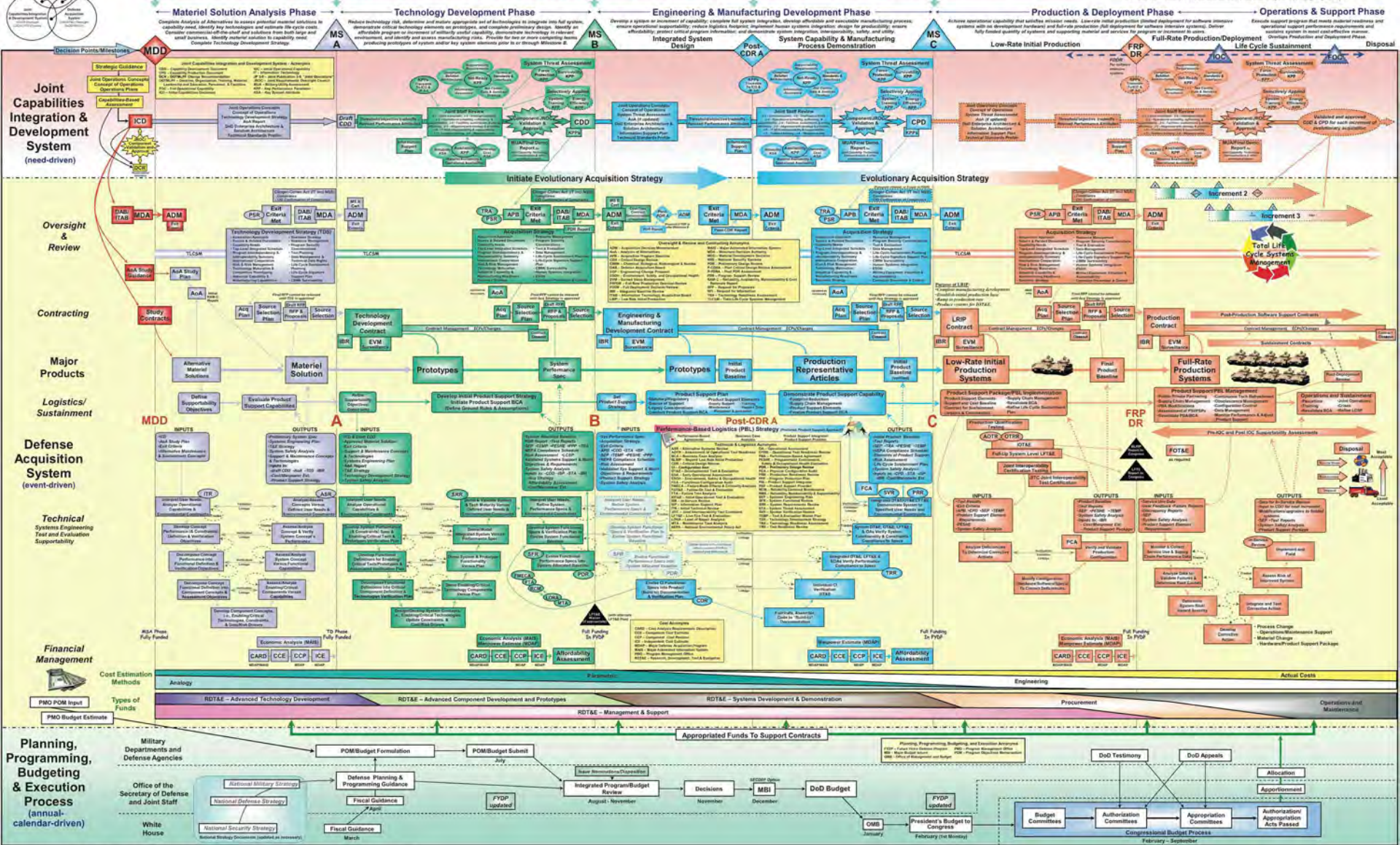
October 2011

Col Gary Kling

Integrated Defense Acquisition, Technology, and Logistics Life Cycle Management System

Following the Materiel Development Decision, the Milestone Decision Authority may authorize entry into the acquisition process at any point, consistent with phase-specific entrance criteria and statutory requirements

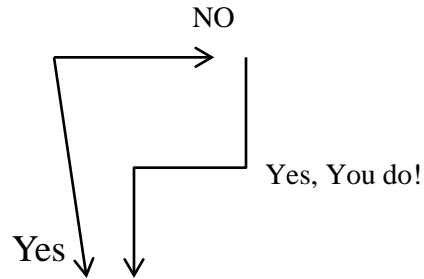
This chart is a reference for Defense Acquisition University students. It provides a general illustration of the flow among three major acquisition systems: the Joint Capabilities Integration & Development System (JCIDS), the Defense Acquisition System (DAS), and the Logistics Life Cycle Management System (LLCMS). Supporting information is located at the bottom of this chart. For more information, see the Defense Acquisition Process (DAP) (DAU-001-001).



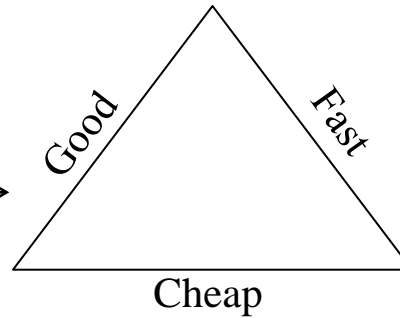
Acquisition Marine Style

Marine Aviation

Do I need to kill something?



Pick 1, maybe 2 of 3



Take it from someone

Go Kill something

Hurry Up - - go!

Functions of Marine Aviation

Marine Aviation

- ***Offensive Air Support***
- ***Anti-Air Warfare***
- ***Assault Support***
- ***Air Reconnaissance***
- ***Electronic Warfare***
- ***Control of Aircraft and Missiles***



Acquisition for Maneuver Warfare

Marine Aviation

- **Maneuver Warfare**
 - Flexibility
 - Speed/Tempo
 - Surprise/Initiative
- ***How do we maintain a technological advantage and the appropriate capacity to meet the challenges across the ROMO, in an increasingly volatile world, and still have a treasury?***
- **Challenge - How to acquire cost effective systems to enhance Expeditionary Maneuver Warfare.**
 - Adaptive
 - Lack of speed in acquisition breeds requirements creep
 - Moore's law vs the "good idea cutoff date"

Threats / Views

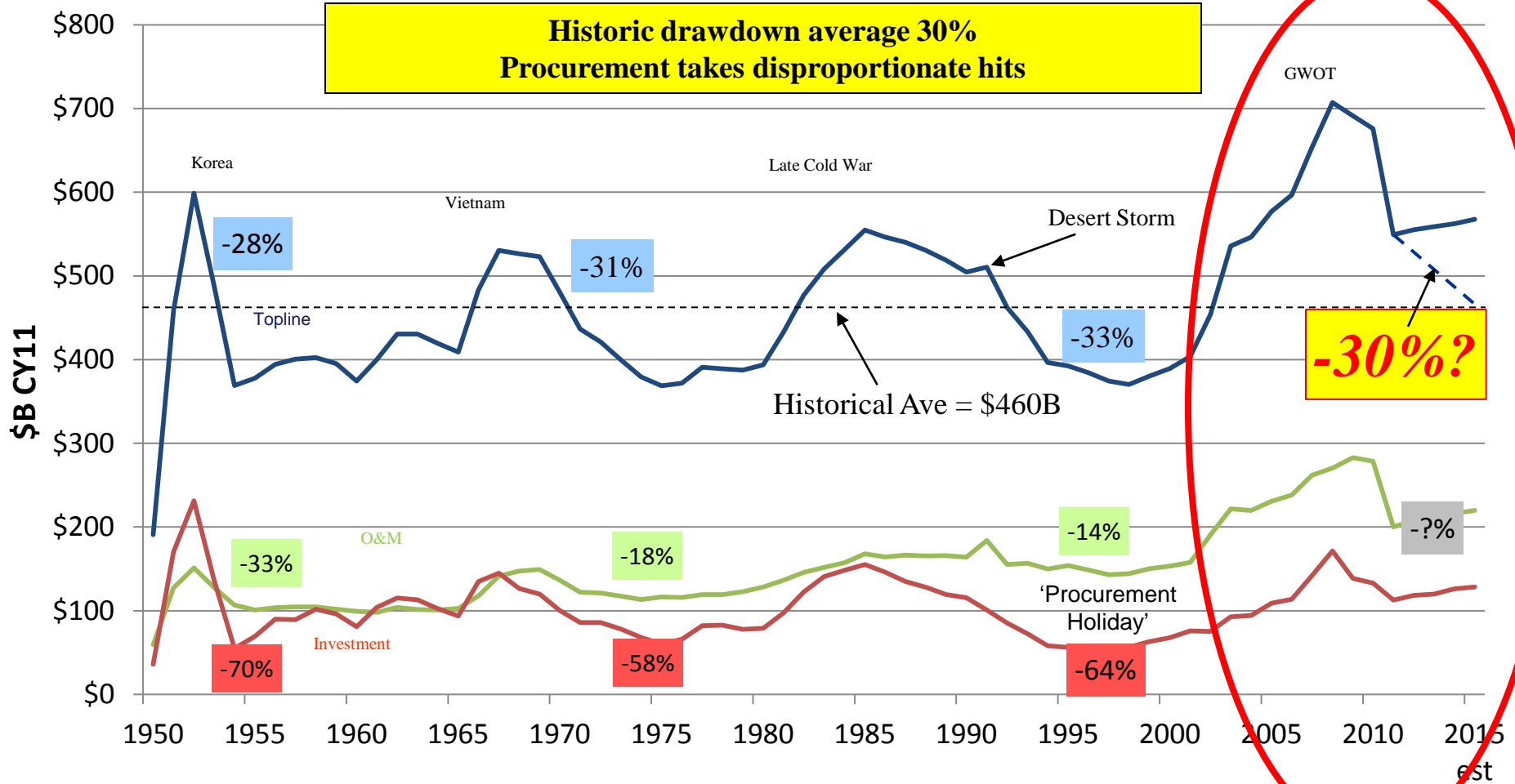
Marine Aviation

- State and Non-state
- Terrorism / Criminals / Insurgents / **industrial espionage**
- Hybrid
- Declining power? Reluctance to engage?
- Deterrence?
- Increased frequency for volatility and instability
- **Distributed ops – re-aggregation**
- Multi-domain – air, sea, land ,cyber, space

Upon what strategy and assumptions do you base long term acquisitions when making decisions for the next 30-50 years?

DOD Budget Context

Marine Aviation

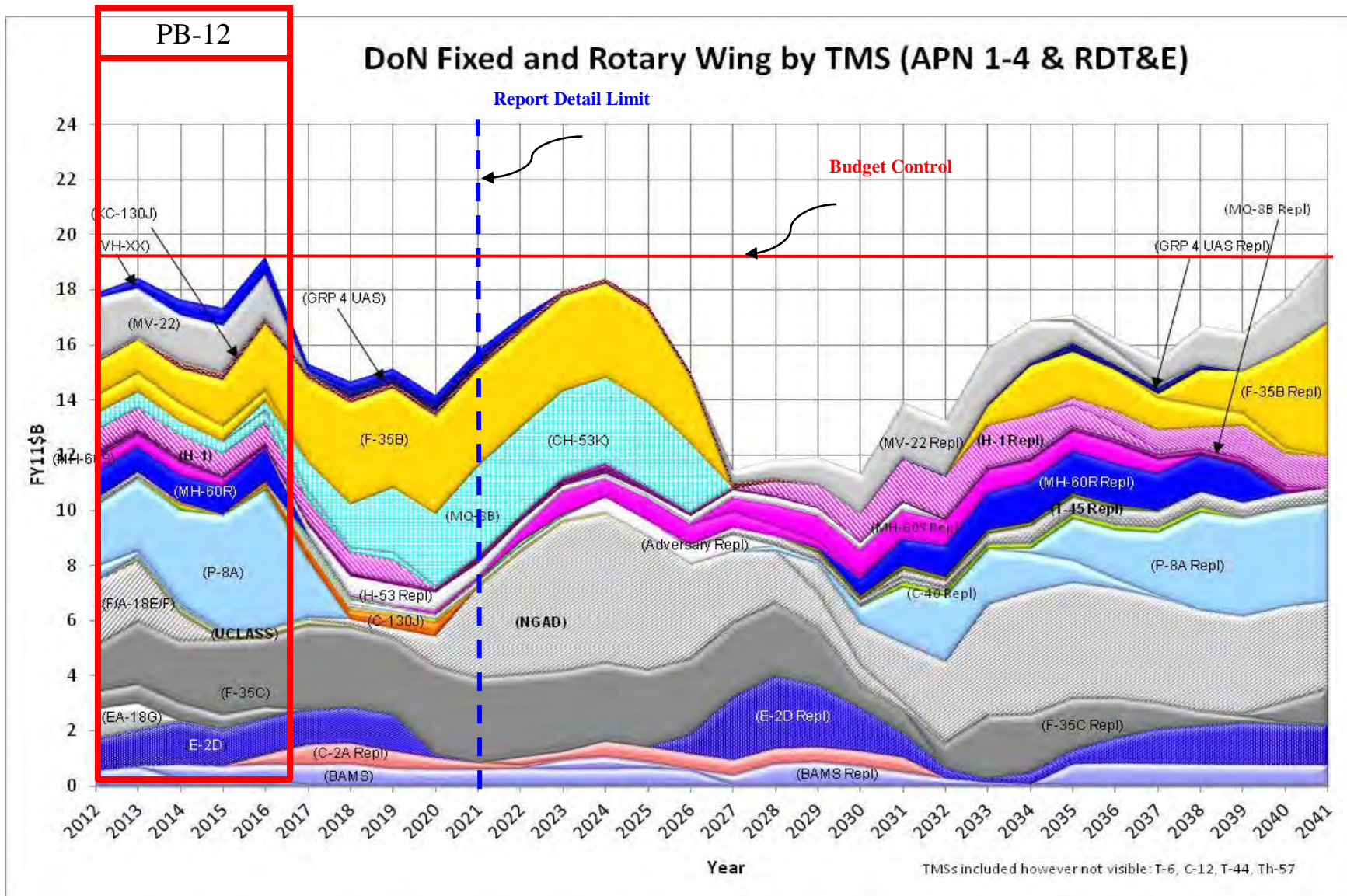


Currently 8-11% down this slope with POM13 - \$3.93B.

DON Aviation Budget Context

PB-12 30 Year Aircraft Investment Plan

Marine Aviation



Marine Aviation Transition Strategy

Today

End State

KC-130 F/R/T



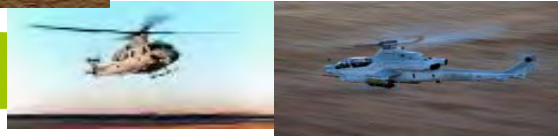
KC-130J

CH-46E



MV-22

UH-1N
AH-1W



UH-1Y
AH-1Z

F/A-18 A+
F/A-18 C
F/A-18 D
AV-8B
EA-6B



F-35B

CH-53E



CH-53K

ISR Services
RQ-7B



RQ-21A
Group 4

VH-3
VH-60

TBD

VXX

Transitions in progress

MWSS

Marine Aviation

Enables All Six
Control of Aircraft and Missiles
Anti-Air Warfare
Assault Support
Aerial Reconnaissance
Offensive Air Support
Electronic Warfare

- **Expeditionary Operations**
 - MWSS is the critical enabler to ACE operations
 - Tactical and Strategic Agility
 - Realignment of MWSS under MAG

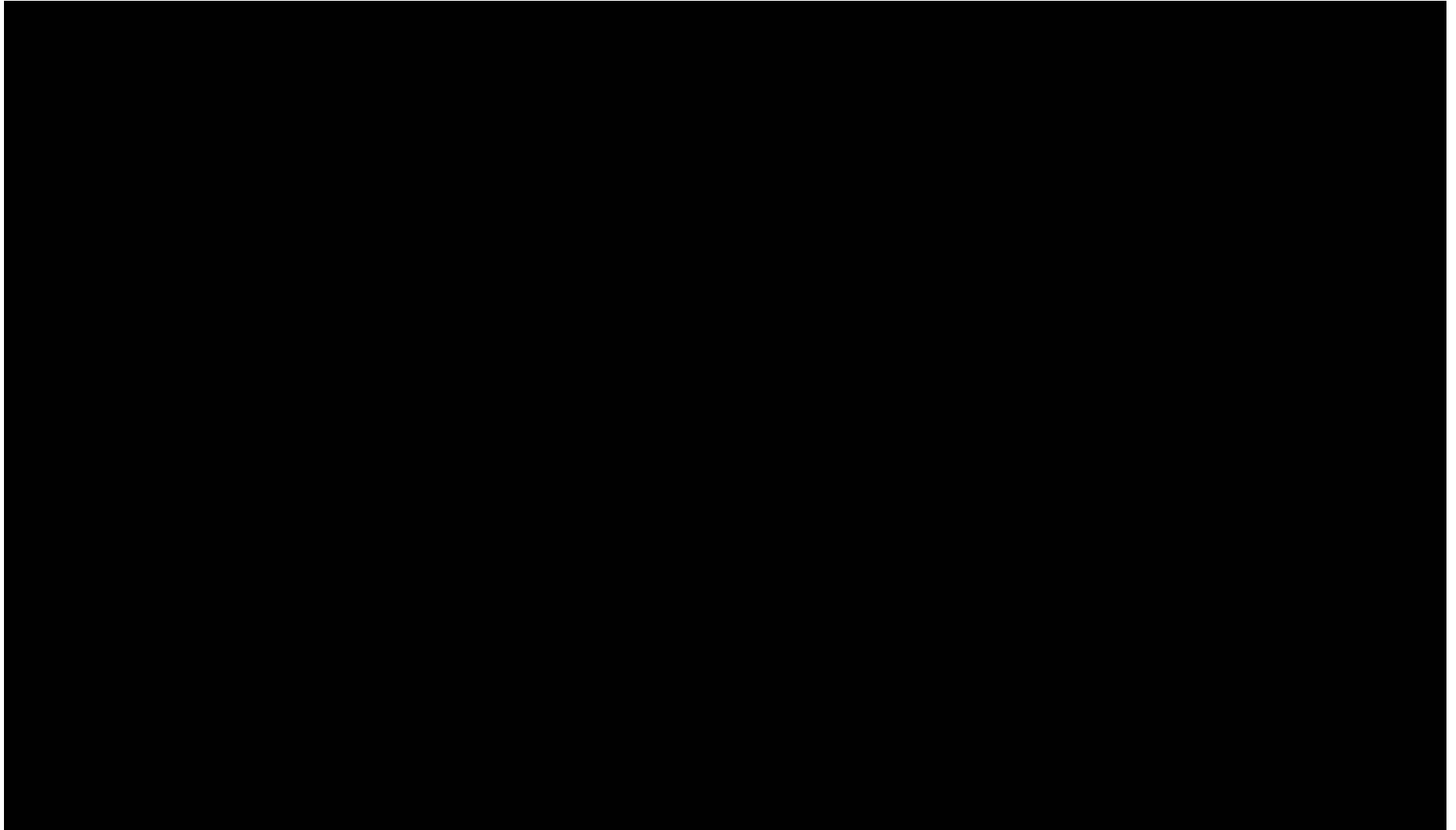
- **EAF 2000 Reconstitution**
 - AM-2 Retrograde and Refit
(6 million sq ft installed ISO OEF)
 - Next Generation Airfield Lighting/Matting



Control of Aircraft and Missiles
Anti-Air Warfare
Assault Support
Aerial Reconnaissance
Offensive Air Support
Electronic Warfare

F-35B JSF Update

Marine Aviation





Control of Aircraft and Missiles
Anti-Air Warfare
Assault Support
Aerial Reconnaissance
Offensive Air Support
Electronic Warfare

MV-22B Osprey

Marine Aviation

Since the FY11 *Marine Aviation Plan*

- 11th deployment:
 - 3 x OIF, 4 x MEU, 4 x OEF
- Enhanced Capabilities:
 - Expanded Battlespace Maneuver
 - Complicates the Enemy's defense
 - Increases Stand-off basing



POR: 360 aircraft
AC: 16 X 12 aircraft
RC: 2 X 12 aircraft

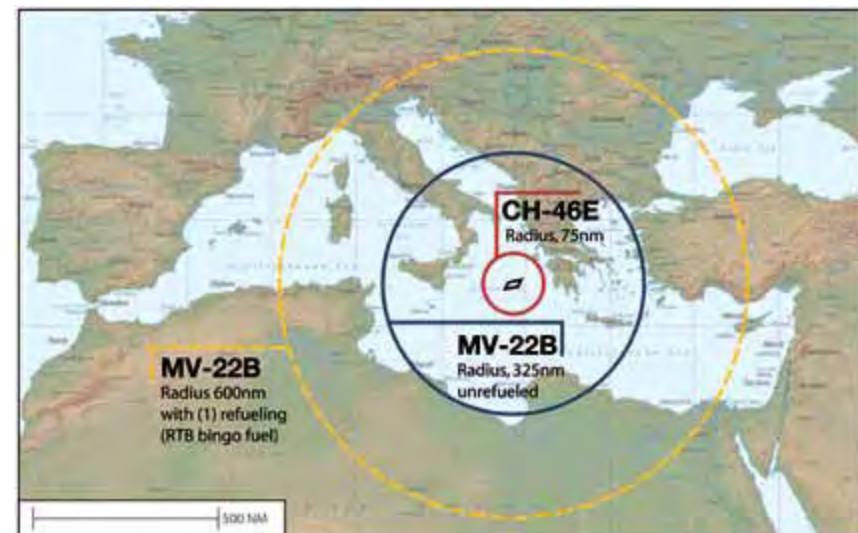
Squadrons: 16 active, 2 reserve

MV-22B Osprey

Marine Aviation



“Turns Texas into Rhode Island.”
– BGen Alles, *CG ACE MNF-W*



MV-22 MISSION SNAPSHOT

Operation Odyssey Dawn

Marine Aviation



26 MEU MV-22's prepare to launch from USS Kearsarge

Afghanistan Retrograde

Marine Aviation



**6 x MV-22's, 3 continents, 10 countries, 3432 NM
25 Marines, 15000 lbs of cargo, 15+25 hrs**

KC-130J

Enables All Six
Control of Aircraft and Missiles
Anti-Air Warfare
Assault Support
Aerial Reconnaissance
Offensive Air Support
Electronic Warfare

Marine Aviation

- Active FOC by 31 Dec 2011
- Reserve transition ~ FY15-26
- Enhanced Capabilities:
 - More efficient aerial delivery
 - Twice the delivery rate for Rapid Ground Refueling (RGR) ops
 - 21% increase in speed
 - Shorter Take-off distances
 - Common engine to the MV-22
 - Integrated ASE



POR: 79 aircraft

AC: 3 X 15 aircraft

RC: 2 X 12 aircraft

Squadrons: 3 active, 2 reserve

KC-130J Harvest HAWK

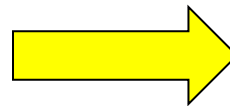
Marine Aviation

- Persistent ISR and attack capability conducted from KC-130 J
 - Preserves refueling capability from RH AAR Pod.
- System Components
 - AN/AAQ-30 Targeting Sight System (TSS)
 - RO/RO fire control station on modified pallet
 - AGM-114P Hellfire II in place of left AAR pod
 - Griffin Stand Off Precision Guided Munitions
 - Video Downlink to Rover



CURRENT FORCE:

1 AC VMGR SQDN x 2 MISSION KIT
1 AC VMGR SQDN x 1 MISSION KIT



FORCE GOAL:

2 AC VMGR SQDN x 3 MISSION KITS

**One kit deployed since Oct 2010 - Identified 8 confirmed and multiple suspected IEDs
Employed 74 Hellfire & 13 Griffin - Feedback from supported units is outstanding**

Harvest Hawk

Marine Aviation



H-1 Program

Marine Aviation

- AH-1Z IOC (February 2011)
 - 84% commonality between Y/Z
 - Reduction in logistics/training requirements
- To date:
 - ~48 Yankees / ~19 Zulus delivered
- Enhanced Capabilities:
 - Yankee
 - Double the range and payload
 - 170 kts versus 130 kt Vne
 - 8 Fully loaded Marines
 - Digitally integrated cockpit
 - Zulu
 - Improved Sensors – Max range Weapons employment
 - Double the Range



POR: 349 aircraft (160 Y, 189 Z)

AC: 8 X 15Z / 12Y aircraft

RC: 1 X 15Z / 12Y aircraft

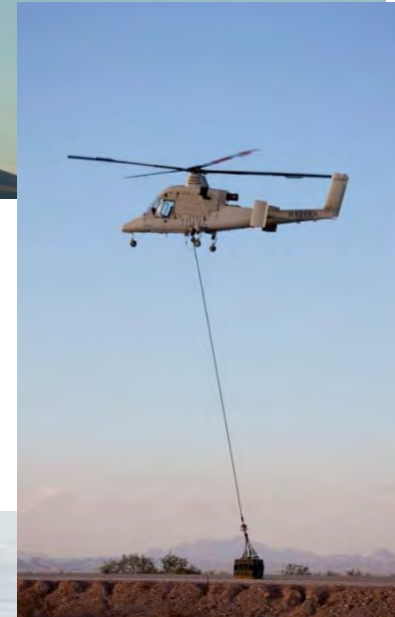
Squadrons: 8 active, 1 reserve

UAS Family of Systems

Control of Aircraft and Missiles
Anti-Air Warfare
Assault Support
Aerial Reconnaissance
Offensive Air Support
Electronic Warfare

Marine Aviation

- RQ-7B Weaponization approved
- RQ-21 Small Tactical UAS (STUAS) early operational capability
 - Fielded starting in Sep 11
- Planned Cargo UAS deployment to OEF
 - Nov 11
- VMU-3 moving to 1st MAW



Ground/Air Task Oriented Radar (G/ATOR) Transition

Marine Aviation

- **G/ATOR: A MAGTF Weapon System**
 - Incr I: Air Defense/Surveillance Radar
 - Incr II: Ground Weapon Locating Radar
 - Incr IV: Air Traffic Control
- Both Engineering Development Models (EDMs) are meeting integration and testing expectations
 - G/ATOR Incr. 1 EDM's are detecting and tracking air traffic at BWI.



- Program is on schedule
- Program is resourced in PB 12
- AAO:

ACE	Qty 31	(Incr I & IV)
GCE	Qty 38	(Incr II)
Total	69	

**G/ATOR replaces 5 legacy radars:
TPS-63, TPS-73, TPQ-46
UPS-3 and MPQ-62**

Capability Drivers

Marine Aviation

- Decrease the Size and weight
 - Lighten the MAGTF OPT ongoing
 - 2010 MEU ACE ~ 520 K; 2020 MEU ACE ~ 800 K
- Increase the speed
 - Sensor to shooter and Kill Chain information
 - FMV, VMF, Digital Interoperability
- Increased efficiency
 - Fuel, Batteries, O&M costs

Acquisition Challenges

Marine Aviation

- **Defining requirements:**
 - What is the problem we are trying to solve?
 - Tension between clarity / industry creativity / contract legality / length of need
 - What capacity?
- **Contracting:**
 - Takes too long
 - UAS contract in work for 2.5 years
- **Multiple transitions simultaneously**
 - USMC / DoD transitions
- **Sustainment and Relevance**
 - Sustainment for the new & Legacy platforms
 - Mod / upgrade costs

Acquisition for 2025 and beyond

Marine Aviation

- Must Avoid a single view of warfare
 - The only thing certain is uncertainty
 - Surprise will be the dominant factor
- Hybrid Warfare – Train and equip for ROMO
- Cost imposing strategies
 - How do we make war too expensive (at least more expensive) for the enemy?
- Time to train & Dwell vs multi-mission platforms
 - Readiness
 - Service life
 - Simulation
- Expeditionary subsystems - Integrated Capabilities
 - Maintenance, **sustainment, training, weapons**, security, interoperability
 - LHA (R) – FUEL, Maint space, C2 options



MARINE AVIATION

The background features several faded, light gray graphics. At the top is a large eagle with wings spread, perched on a shield. Below it is a large, stylized globe. To the left and right of the globe are two sets of wings. The left set has a circular emblem with the letters "ATC" inside. The right set is a simple pair of wings. At the bottom is another eagle with wings spread, perched on a shield with the words "AIR CREW" below it.

Questions





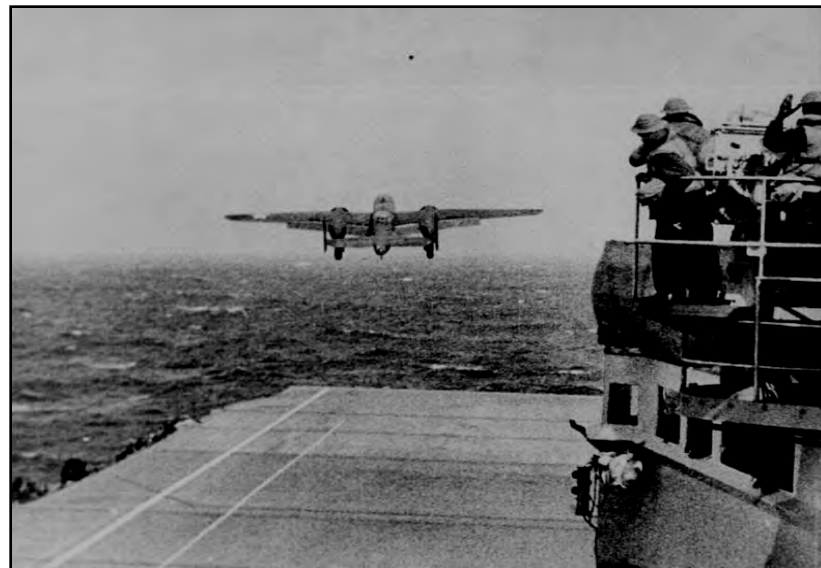
Building Operational Flexibility

**RDML Dave Lewis
Program Executive Officer, Ships
Expeditionary Warfare Conference
October 26, 2011**

USS Hornet - Dolittle Raid



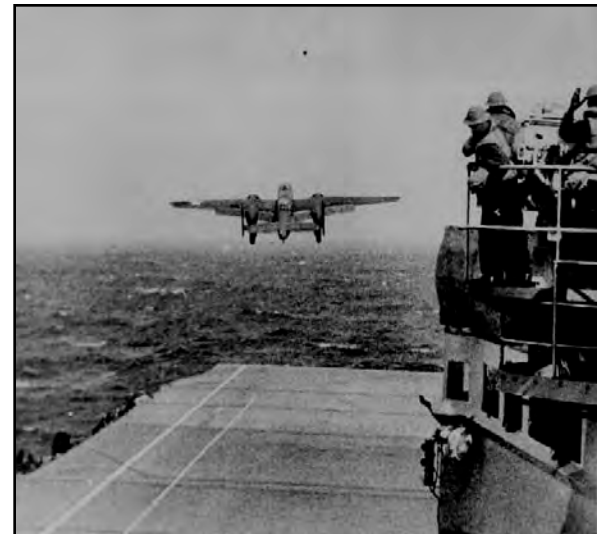
Program Executive Office, Ships



Timeline of Doolittle Raid

**December
1941**

21 Dec- President Roosevelt expresses to JCS that he wants to bomb Japan ASAP to boost public morale after Pearl Harbor disaster.



**January
1942**

10 Jan- Concept for the attack developed by Navy CAPT Francis Low, Asst CoS for ASW. CAPT Low reports to Adm. King that twin-engine Army bombers could be successfully launched from an aircraft carrier

**February
1942**

3 Feb- Two B-25s loaded aboard USS Hornet at Norfolk and flown off deck without difficulty. Leads to immediate approval of the raid and the 17th Bomb Group is chosen to provide the recruits for the mission.

**March
1942**

1 Mar- The 24 crews selected for mission received intensive training (simulated carrier deck takeoffs, low level and night flying, low-altitude bombing) for three weeks in Eglin, FL.

25 Mar- Remaining 22 B-25's leave Eglin for McClellan Field, Calif. Arrive two days later at Sacramento Air Depot for final modifications.

**April
1942**

1 Apr- 16 B-25 bombers hoisted to flight deck and parked on USS Hornet while moored at NAS Alameda pier. The B-25 Detachment consisted of 70 officers and 130 enlisted men under the command of Lieut. Colonel James Doolittle, U.S. Army.

2 Apr- USS Hornet and Task Force 18 leave port of Alameda and rendezvous with Task Force 16, commanded by VADM Halsey, a few days later.

April 1942

18 Apr- Task Force 18 spotted by Japanese picket boat, which radioed an attack warning to Japan. Doolittle decides to launch B-25s immediately -10 hours earlier and 170 nm farther from Japan than planned. First B-25 launched at 0825 and 16th bomber (last) launched 0920.

Aircraft Embarked on Pacific Fleet CV's



Program Executive Office, Ships

Peacetime

(1939-1940)



Early Wartime

(1941-1942)



Intermediate Wartime

(1943-1944)



Late Wartime

(1945)

Douglas TBD-1 Devastators



F4F-3 Wildcats



SBD-3 Dauntlesses



F4U Corsairs



SBC-2 Helldiver



F4F-4 Wildcats



SBD-5 Dauntlesses



TBM Avenger-3/3E/3N



SB2U-1 Vindicators



Army B-25's, Army P-40's



Grumman F6F-6 Hellcats



SBC2 Helldiver



Aircraft Embarked in USS Midway



Program Executive Office, Ships



Aircraft Embarked in USS Midway

1940's

Corsair, Hellcat, Helldiver, Avenger



1950's

AVAIL [Nov 1950-Apr 1951] Reinforcement of flight deck to accommodate heavier aircraft

Mauler, FH-1 Phantom, Bearcat, F9F Cougar

AVAIL [1955-Sep 1957] Extensive modernization program for capability to operate high performance jet aircraft. Fitted with two steam catapults on the bow and a shorter steam catapult in the new angle deck to allow ready deck launches. Additional improvements included enlarging the number one elevator to accommodate longer aircraft, jet blast deflectors, and the largest aviation crane ever installed on an aircraft carrier.



1960's

AVAIL [Feb 1966] Flight deck increased in surface area from 2.82 acres to 4.02 acres. Elevators were enlarged, relocated, and given almost double the weight capacity. Two powerful new catapults on the bow, three new arresting gear engines, and one barricade were installed and rearranged to accommodate a change of 13 degrees to the angle deck. Smaller waist catapult removed since it was ineffective in launching the now heavier aircraft.

1970's

F8 Crusader, F4 Phantom, Corsair II, A6 Intruder, E2 Hawkeye



1980's

AVAIL [Mar 1986] Addition of the catapult flush deck nose gear launch system, the additions of MK7 MOD1 jet blast deflectors, new air traffic consoles, and the construction of intermediate maintenance avionics shops to support the F/A-18 aircraft.



1990's

F/A 18 Hornet

USS Eisenhower- Invasion of Haiti



Program Executive Office, Ships



Operation Uphold Democracy

**July
1994**

29 Jul- 10th Mountain Division given mission to form Joint Task Force 190 to carry out Operation Uphold Democracy

31 Jul- UN passes Resolution 940 calling for the “application of all necessary means” to restore democracy in Haiti. Resolution authorized a U.S. led invasion force, followed by multi-national peacekeeping force.

26 Aug- President Clinton approves military’s plans for invasion.



**August
1994**

12 Sep- Eisenhower’s aft hangar bay selected for vehicle and equipment staging- filled with 25 HMMWV’s, 3 trailers, and numerous Army supplies. Ammo was uploaded into the magazines .

14 Sep- USS Eisenhower sails from Norfolk with 10th Mountain Division unit embarked using the concept of “adaptive force packaging”- using USS Eisenhower as an Army helicopter and troop carrier.

19 Sep- 10th Mountain Division conducts air assault from carrier USS Eisenhower to seize Port-au-Prince Int’l Airport and the port itself. 1st Battalion 22nd Infantry lands at Port-au-Prince Airport, flying directly in from U.S.

19 Sep AM- All 18 Black Hawk helicopters ferry troops ashore. First two HMMWV’s staged on Eisenhower’s fantail while additional 12 vehicles were staged.

19 Sep- HMMV’s lifted off flight deck of Eisenhower by either Army Black Hawk helos or Navy CH-53 helos and ferried to the shore. By the end of 19 Sep, both infantry battallions and their equipment were ashore.

**September
1994**

22 Sep- Sling-load operation completed after four days. During its course, 204 sling loads were transported ashore.

LCS Maritime Superiority Module (MSM)

2008

April - MSM Formalized into SUW MP Increment III.



2009-
2010

Sep
2009

MSM requirement defined for Early Deployment

Jan
2010

Prototype MSM Equipment Procured and Included in SUW MP Early Deployment Configuration. A prototype MSM berthing container was developed to rapidly provide Visit, Board, Search and Seizure (VBSS) capability to LCS.

April
2010

LCS 1 (USS FREEDOM) Early Deployment Success: SUW MP embarked with prototype MSM, LCS 1 completed 29 11m Rigid Hull Inflatable Boat (RHIB) launch/recovery operations, Seized 4.23 tons of drugs during 4 interdiction operations.

Delivery of RHIBs / VBSS AEL / Baseline Berthing Modules and Sanitary Containers for 2 MSM packages based on formal requirements (Interface Control Document Ver 1.2)

2011



All MSM equipment was delivered to LCS 1 within 4 months of requirement definition.

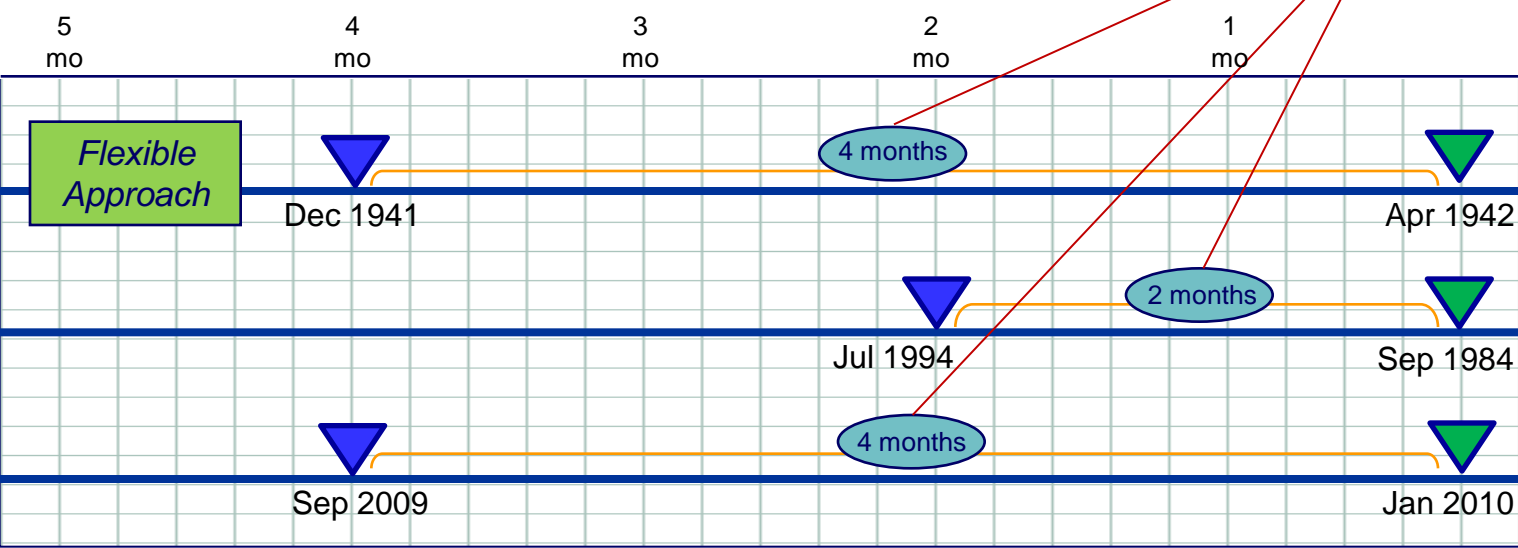
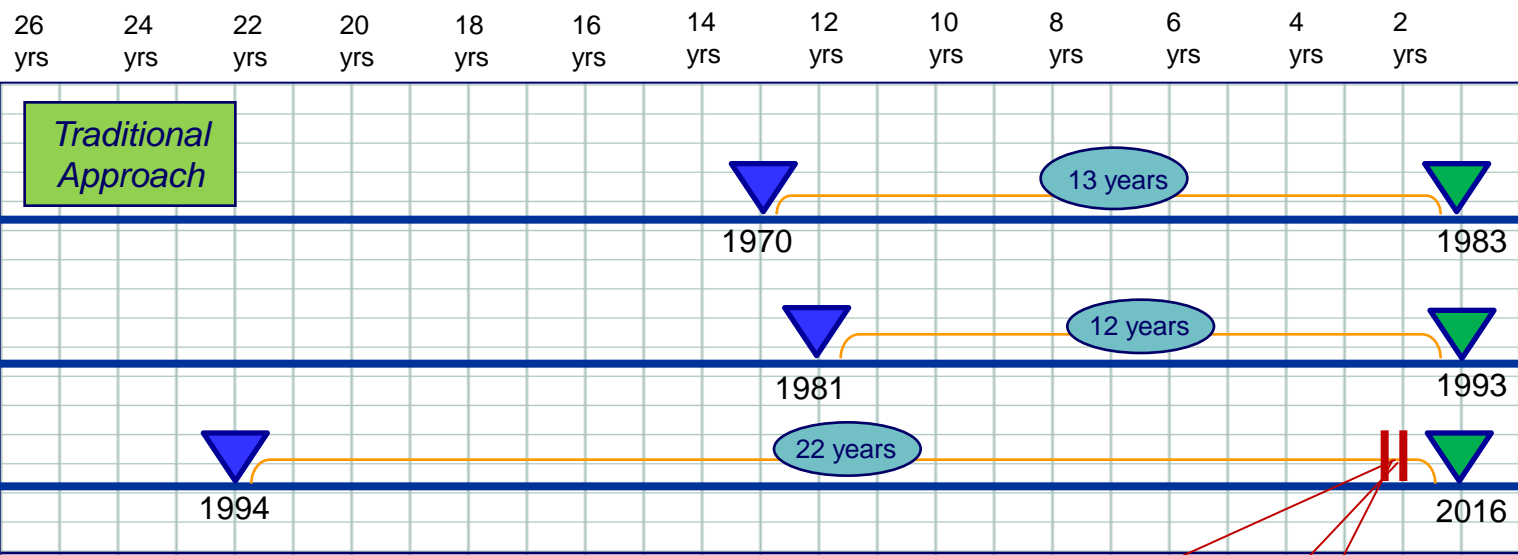
• Early Deployment Equipment

- Visit, Board, Search & Seizure (VBSS) Boarding Equipment for two teams
- 2 x 11m RHIBs with cradles
- One 12-man 20 ft prototype berthing container
- One prototype shower container
- 1 x 10' VBSS Equipment Storage Container

Operational Flexibility



Program Executive Office, Ships



▼ = Requirement ▼ = Fielding

Ticonderoga

Arleigh Burke

SC 21

Hornet

Eisenhower

Freedom

Combat System Development vs. Ship Design and Construction

Attribute	Combat Systems	Ship Design & Construction
Timeline	Short	Long
Expertise required	Electronics, software	HM&E, Hardware
Configuration	Volatile	Stable
Effect on <i>Design</i> Ship Service Life	Little influence	Strong driver
Effect on <i>Actual</i> Ship Service Life	Strong driver – can't cost effectively update	Moderate driver – Ships decommissioned early

Affordability will become increasingly important

Modular adaptable ship technologies enable ships to affordably remain operationally relevant over their service life.

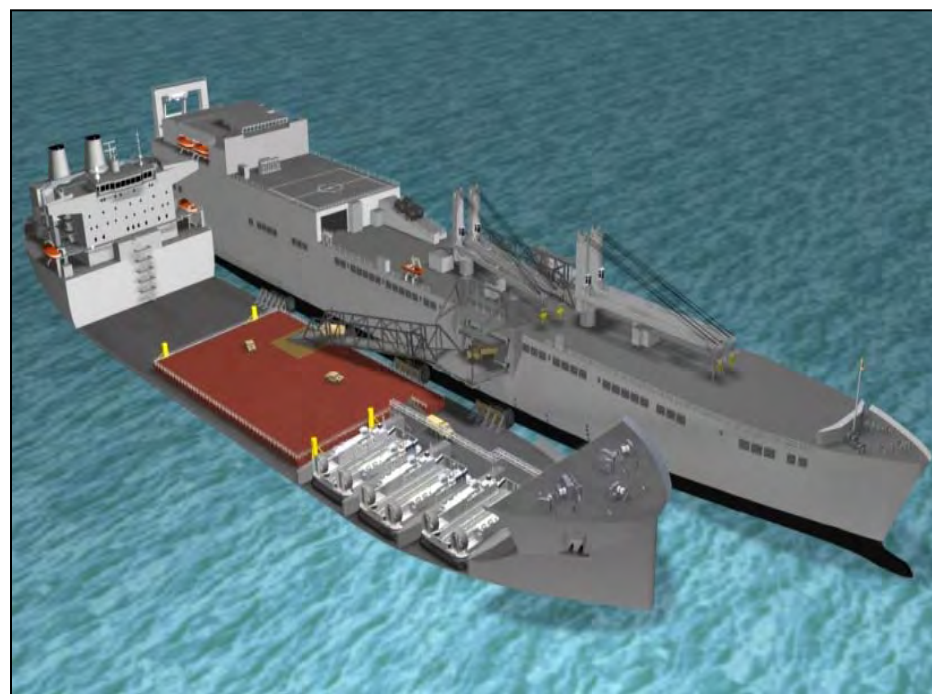
Modular adaptable ship technologies are not yet an institutional part of our design and modernization processes.



Modularity Today

• Cost Control Initiatives

- Performed requirements versus cost trade-offs to achieve 80% of original MLP capability at 40% of the cost
- Concurrent design/production engineering approach ensured a high degree of design and production planning maturity prior to start of construction to minimize cost and schedule risk
- Government-led contract for deck interface
 - Refine and translate the requirements into the design and specifications
 - Competing the contract
 - Synopsis released Sep 28



• Program Status

- MLP 1 Start of Construction was Jun 2011
 - Currently 8% complete
- Core Capabilities Set RFP to be released in Nov

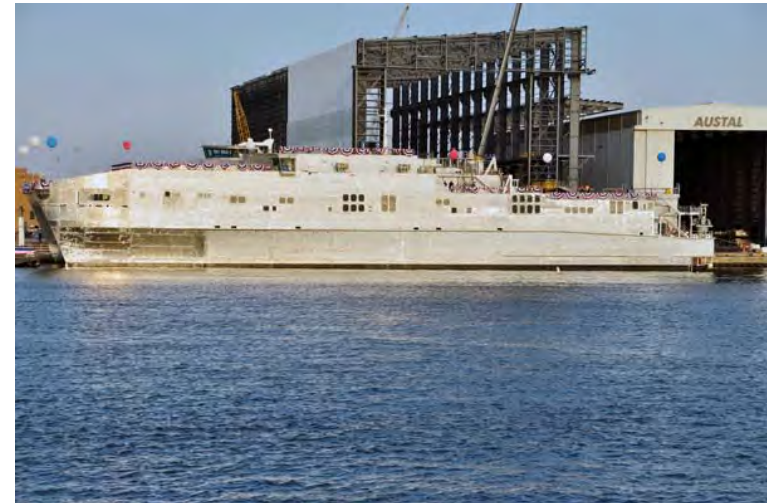
Joint High Speed Vessel (JHSV)



Program Executive Office, Ships

• Cost Control Initiatives

- Designed to commercial standards
- Conducted rigorous production readiness review prior to start of construction, ensuring design maturity greater than 85%
- Modular Manufacturing Facility will aid in production of high quality ship modules and improve production efficiencies
 - Improve capacity, production planning and process control
 - Reduce construction duration, lower production costs, and mitigate existing production process and control risks



• Program Status

- Detail design and construction contract for ten ships with seven options exercised
- USNS Spearhead (JHSV 1) Christened Sep 17, 2011
 - Currently 92% complete
- JHSV 2 started production in Sep 2010
 - Currently ~45% complete
- JHSV 3 started production in Sep 2011
- Contract for JHSV 4 and JHSV 5 awarded Oct 2010
- Contract for JHSV 6 and JHSV 7 awarded Jun 2011



Aircraft, Boats, UUV, UAV, USV

- What:
 - Support for multiple types of aircraft, boats, unmanned underwater vehicles, unmanned air vehicles, and unmanned surface vehicles.
 - Vehicle Stowage, Communications, Command and Control, Maintenance.
 - Vehicle Handling.
 - Boat Davits and Helo Deck
 - UUV / USV handling gear
 - UAV launch and recovery
- Why:
 - Extend the offboard reach of sensors and weapons. Enable independent development of the ship and the embarked vehicles.
- Status:
 - Well Established methods for integrating manned aircraft and craft

**Need to mature systems and methods for integrated unmanned systems.
Need to develop methods to value different combinations and numbers of craft.**



Electronic Modular Enclosures (EME)



- What:
 - Encapsulation of Commercial Off the Shelf (COTS) electronics in a modular enclosure to enable equipment survival in a naval combatant environment.
- Why:
 - Allow COTS equipment to be used on a naval combatant.
 - Provide standardized equipment racks to enable rapid reconfiguration of the electronics.
- Status:
 - Will be installed on DDG 1000 based on DBPS section 681 and ICDS.
 - EME Design Criteria Manual Exists for specific DDG 1000 application
 - May be beneficial to convert DBPS section 681 to a MIL-PRF

Electronic Modular Enclosures

4 sizes of EME, 16 per Ship

	Length	Width	Height
Mini	18 ft	7 ft	7.45 ft
Small	25 ft	11.8 ft	7.45 ft
Medium	30 ft	11.8 ft	7.45 ft
Large	35 ft	11.8 ft	7.45 ft

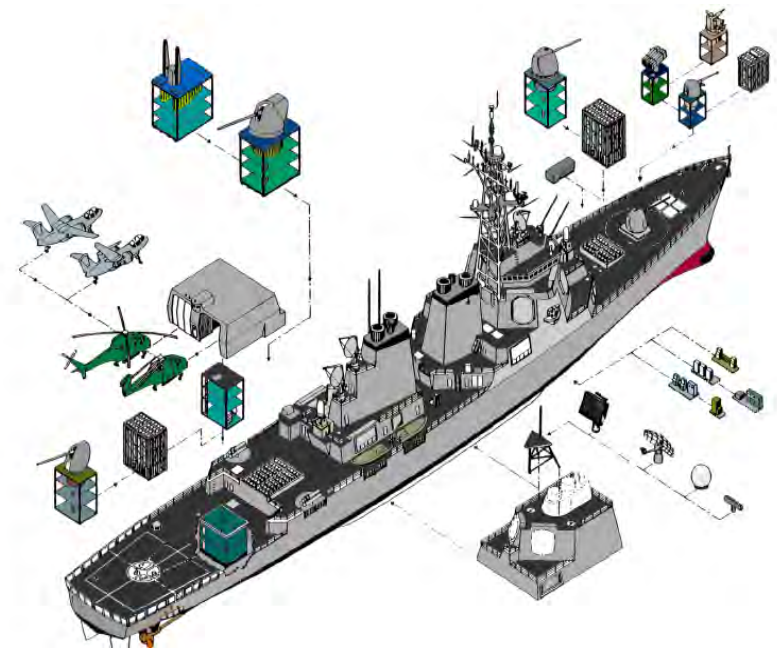
- Specialized shelter provides environment for Commercial Off The Shelf (COTS) Hardware
- 16 shelters house 236 cabinets
- Shock, Thermal, EMI, Security, & Noise Reduction
- Power Distribution and Control
- Enables Integration of electronics in factory

**Need improved Cost Estimation methods.
Need method to Value EME.**



Weapons/Electronics Modules / Zones

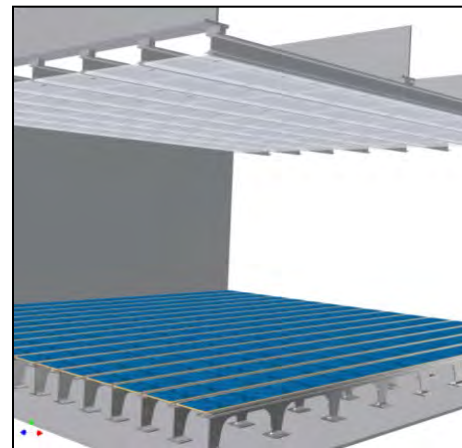
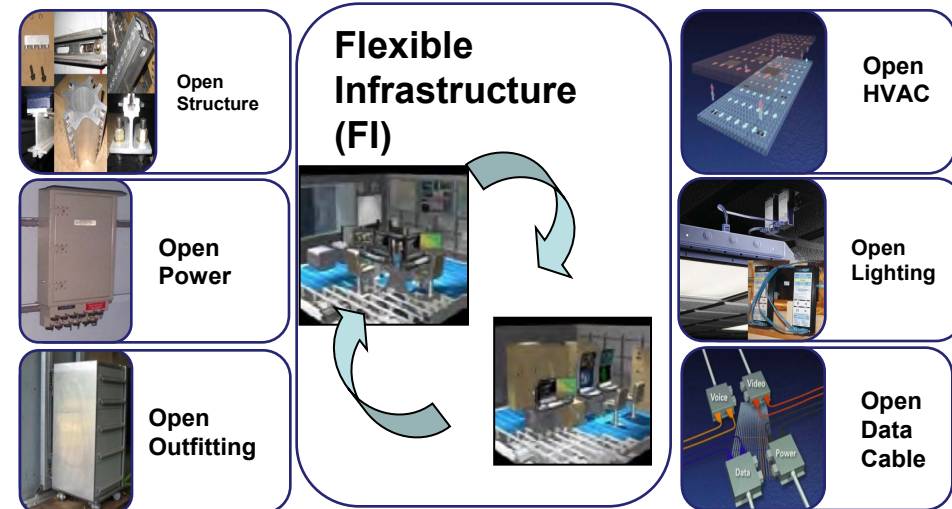
- What:
 - Predefined and standardized physical, structural, and distributed system interfaces for weapons modules.
- Why:
 - Facilitate upgrading of combat systems elements.
 - Facilitate reuse of combat system elements across ship classes.
 - Works well for elements that require both internal to the ship and external access.
- Status:
 - Guides Exist.
 - Specifications from original modularity efforts of 80's exist as a baseline.



Need Specifications and Standards development.
Need Cost Estimation methods.
Need method to value Weapons Modules / Zones needed.

Flexible Infrastructure

- What:
 - Infrastructure for an interior space to enable rapid reconfiguration without welding or other labor intensive activities.
- Why:
 - Facilitate rapid adaptation of spaces likely to change often during the service life of a ship.
 - Works well for command and control spaces and electronics intensive spaces.
- Status:
 - Demonstrated on ships. Standard Drawings in approval process.
 - Handbook in approval process.
 - Cost Data Exists, but not yet incorporated into cost models.

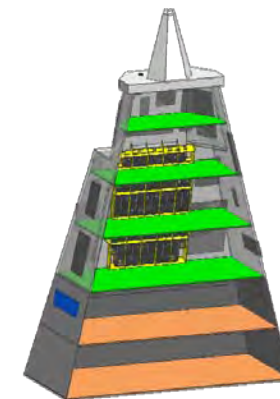


Need to develop method to Value Flexible Infrastructure

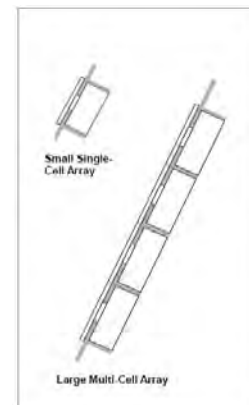
Aperture Stations

- What:
 - Standardized ship-aperture interfaces in the topside design of the ship to enable upgrading of transmit and receive modules.
 - Integrated into the ship in a manner to minimize co-site / EMI issues.
- Why:
 - Decouple transmit / receive module design from the ship design.
 - Enable combat systems design to be concurrent with detail design and construction of the ship.
 - Enable upgrading of apertures during the ship's lifecycle.
- Status:
 - ONR InTop INP is demonstrating how to use same array to meet multiple missions.
 - ONR Aperstructures programs demonstrating integrated apertures with OA structural integration ICDs.

Need to demonstrate that the array design facilitates modular upgrading over the service life of ship.
Need to develop an industrial capacity.
Need to develop specifications, standard drawings, and handbooks.
Need to develop cost estimating relationships.
Need to develop methods to value Aperture Stations.



Aperstructures



Design Alternatives

Range of Options

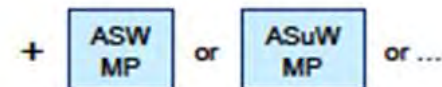
Generic (Civ / Mil) hull with full modularity

- Containerized reconfigurable or mission modules
- Combat systems independent of hull (treat like CVW)
- Modular hull design options



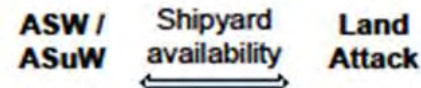
Single Mission modules

- Interchangeable mission modules
- Reconfigurable (~24 hrs)



Same ship—reconfigurable mission packages

- Only in shipyards



Different capabilities—common hull

- Pre-defined physical, structural, and interfaces for weapons modules
- Open architecture systems for modernization






CruDes (DDG-51 Fit IV)

- Full spectrum multi-mission
- Same across flight
- Modular via VLS



AAW / BMD / ASW / ASuW / Land Attack

- “Operational Flexibility” is emerging as a valid warfighting requirement
- Ship designs have proven capable of operational flexibility
 - CVN 
 - Amphibious Ships 
 - LCS 
 - JHSV (under construction)
 - MLP (under construction)
- Modularity provides one path to greater operational flexibility

**New demands require
new approaches.**



Questions?



Expeditionary Warfare Systems Acquisition Challenges

26 October 2011

RDML Jim Murdoch, USN
PEO LCS

Distribution Statement A: Approved for Public Release; Distribution Unlimited. (11/8/2011). This Brief is provided for Information Only and does not constitute a commitment on behalf of the U.S. government to provide additional information and / or sale of the system.



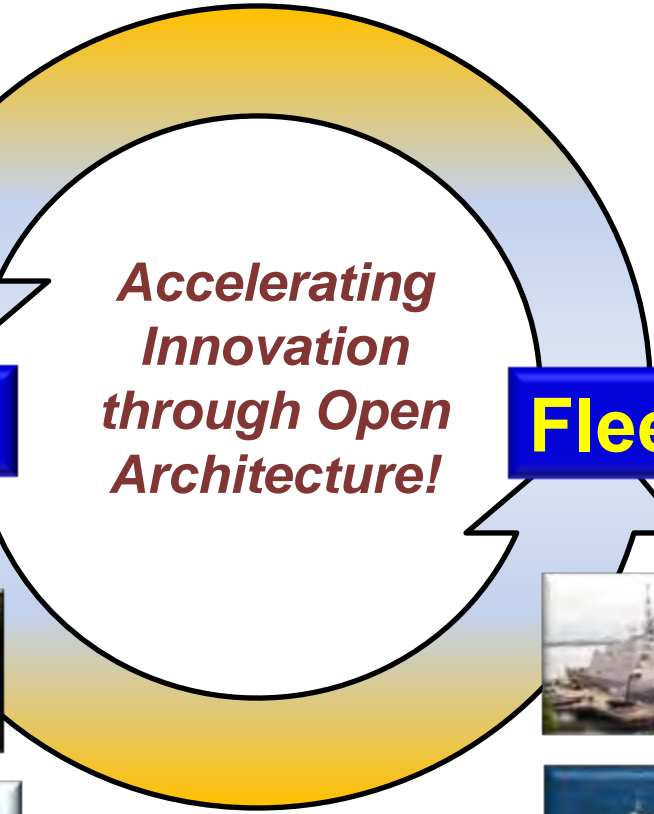
The Business of PEO LCS



LCS Seaframes



Mission Modules



Fleet Introduction





Littoral Combat Ships



- **Modular open systems architecture**
 - Flexible system for dynamic battle space
 - Advanced unmanned air, surface, and underwater vehicles
 - Onboard sensors, weapons, command & control
 - Mission modules interchangeable
 - Maximizing interchangeable components within modules
- **Optimized for warfighting in the littoral**
 - Unique designs for unique environment
 - Fast, maneuverable, shallow draft
- **Targeted at critical capability gaps**
 - Reconfigurable single mission focus
 - Mines, small fast surface craft, diesel submarines
- **Joint Force multiplier**
 - Fully netted with battle force





What is different about LCS?

- Small crew size – Smaller organic workforce aboard ship
- Train to Qualify/Train to Certify
- Ship designed with less redundant systems, but more planned Steaming Hours with multiple crews
- Programmed operating and shortened regular maintenance cycles
- Mission Module maintenance ashore
- Management and execution of “Command Programs” moved ashore
- First class of ship with Material Reliability and Availability metrics in the Acquisition Strategy



PEO LCS History

- ☑ 01 Feb 02 ASN (RDA) Established LCS Program Office
- ☑ 17 Mar 03 PEO (Ships) given overall responsibility for Program Management, PEO (LMW) for Mission Modules and PEO (IWS) for Warfare System development and integration
- ☑ 05 May 11 ASN(RDA) memo directs formation of PEO LCS:



- **Reorganization will include the following offices:**
 - Littoral Combat Ship program (PMS 501)
 - LCS Mission Modules (PMS 420)
 - Remote Minehunting System (PMS 403)
 - Unmanned Maritime Systems (PMS 406)
 - Mine Warfare (PMS 495)
 - Fleet Introduction (PMS 505)

EFFECTIVE 11 JUL 2011, THE OFFICES THAT MANAGE THE SEAFRAME AND MISSION MODULE PROGRAMS WERE COMBINED UNDER A SINGLE PROGRAM EXECUTIVE OFFICE – PEO LCS



Near Term Focus



- Improve program **integration and execution**
 - Balancing the demands of program cost, schedule and performance requirements so that we may deliver and sustain timely, credible Littoral Combat Ship capability to the Fleet
- Formally establish a LCS **Fleet Introduction Program Office**, with defined roles, missions and staff
 - Support the **requirements** of Littoral Combat Ships, the **integration** of aviation capabilities, and improve test and evaluation efforts
- Assess proposed LCS new mission capability, ensuring that we sustain ship design **stability and affordability** throughout our contracted block procurements.



PMS 505 Fleet Introduction and Sustainment



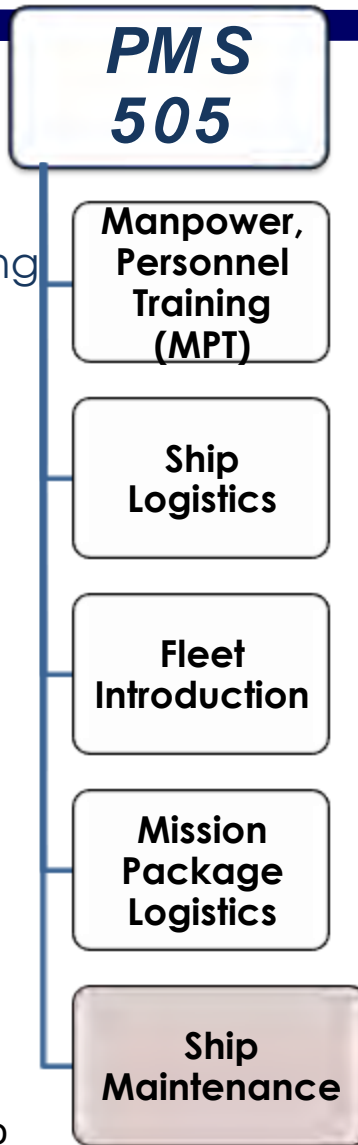
- Combine all aspects of LCS Fleet Introduction and Sustainment under one Program Office
 - Encompasses the functions and responsibility currently residing in multiple program offices within NAVSEA
 - Provides a single point of entry for the Fleet, Type Commander, and the Maintenance and Sustainment communities
 - Seaframe and Mission Package training will be broken out from their respective Logistics departments (under PMS 501 and PMS 420) and integrated in one department under PMS 505
 - Increased focus on Manpower, Personnel, Training
 - New construction and in-service Logistics support will be combined to leverage experienced support personnel
 - Establish and manage maintenance processes that will support the full service lives of the ships and mission modules



= HQ(DC)



= San Diego





It is time to:



- Bring together the focused mission capabilities we need to address today's and tomorrow's threats, while retiring yesterday's systems
- Seek, more actively, the thoughts of the fleet and learn from the past two years of LCS operation
- Get these capabilities through operational testing
- Consider, in innovative ways, where the unique LCS design philosophy can take us in new mission roles



Questions





NDIA 16th Annual Expeditionary Warfare Conference

**Rear Admiral Jim Shannon
October 26, 2011**

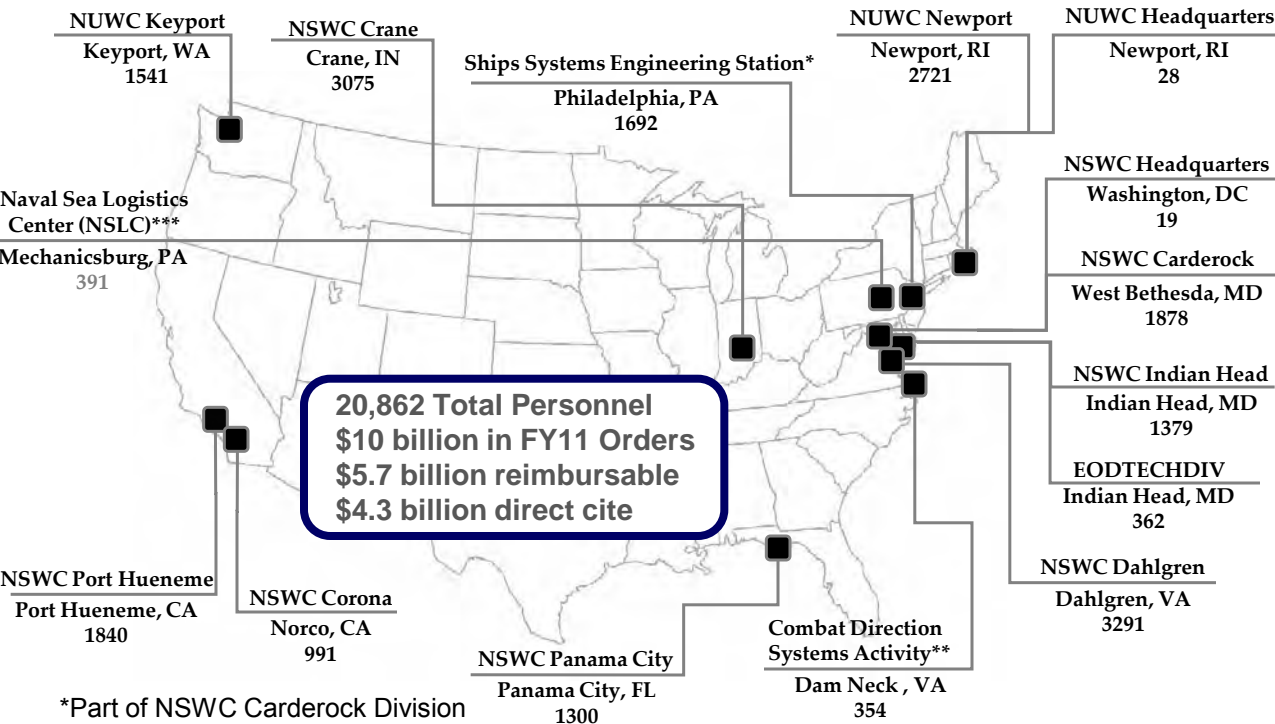
Decades of Experience and Lessons Learned...



Intellectual Capital of the Navy... Yesterday... and Today...



...evolved into a collaborative lab network



*Part of NSWC Carderock Division
 ** Part of NSWC Dahlgren Division
 *** Part of NUWC Keyport Division

- Provide research and development (R&D), test and evaluation (T&E) for the future Navy and in-service engineering and logistics support to the current Navy Fleet
- Business-based enterprise operating under the Navy Working Capital Fund
- Critical concentration of scientists, engineers and technicians (~14,700) with over 600 PhDs
- Unimpeded access to unique military facilities and technical capabilities

Warfare Centers (WFCs) exist to:

- Understand the technical dimensions of military problems
- Liaison with industry and academia to define the best solutions
- Provide quality assurance for Navy Programs
- Provide lifecycle support for Navy ship and submarine systems

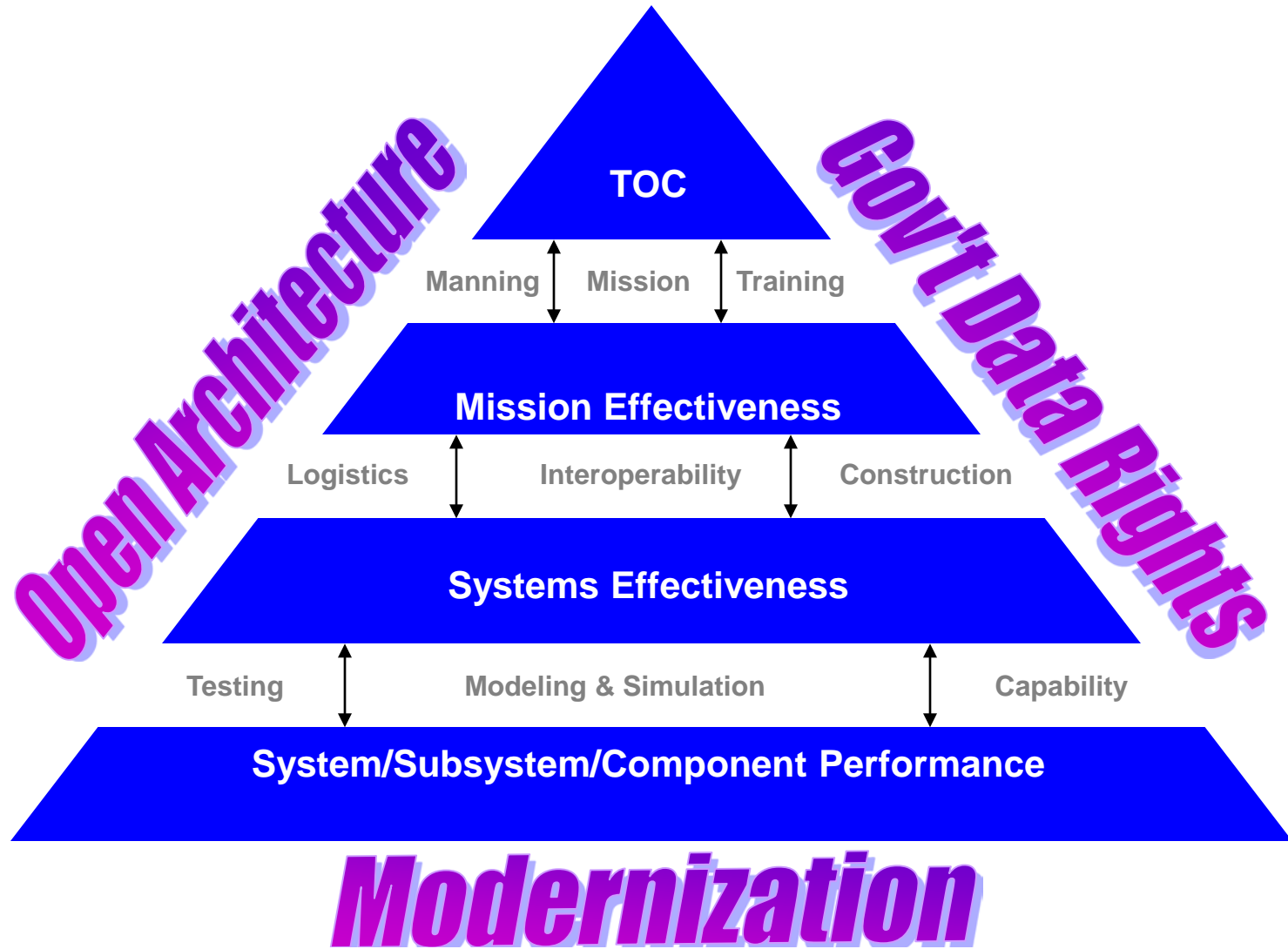


Products and Services Output

- In-Service solutions for Today's Fleet
- Technical Authority Advice and Decisions
- Interoperable Warfare Systems
- Innovation to provide technology solutions and facilitate technology transition to Tomorrow's Fleet

Finding the right balance to optimize Fleet conditions

All Roads Lead to the Cost Challenge



Building Trust and Transparency is Critical



And we count on our Industry Partners to help us with the cost challenge

Total In-House Capacity					Outsourced Workload			
Core Capability = Gov't Role					Industry Role			
Work Government Must Do	Technical Pipeline	Work Industry Can't or Won't Do	Best Value	Economic Viability	Design & Build	Unique Skills/ Capabilities	Best Value	Economic Viability
<ul style="list-style-type: none"> • Technical Authority • Smart Buyer • Independent Assessment • Avoid technical surprise (innovation) • Directed by higher authority • Title 10 	<ul style="list-style-type: none"> • Hands-on work • Sustain Knowledge Areas 	<ul style="list-style-type: none"> • Last source • High risk • Not profitable • WFPP 	<ul style="list-style-type: none"> • Data Rights • Design Disclosure • No fees • Life Cycle Maint. • Cost • Schedule • Performance 	<ul style="list-style-type: none"> • Generate sufficient OH • Sustain affordable rates • All other technical work 	<ul style="list-style-type: none"> • Produce end products and services 	<ul style="list-style-type: none"> • Only source • No compelling reason for government source • Not available in govt & critical to successful task completion 	<ul style="list-style-type: none"> • Efficient Production • Commercial gains • Cost • Schedule • Performance 	<ul style="list-style-type: none"> • Work is needed to sustain critical assets that are fragile in the private sector
Total Force Requirement								

Finding the right balance to optimize Fleet conditions



With an eye on cost, we can't lose sight of keeping our technical asymmetric advantage

High Density Reactive Material

- ONR
- NSWC Indian Head Division
- NSWC Dahlgren Division
- Small Business (SBIR)
- Academia



Additional examples of keeping our asymmetric advantage



Mk28 UBA



Marine Corps
Route Recon and
Clearance



LCAC Systems
Integration Lab



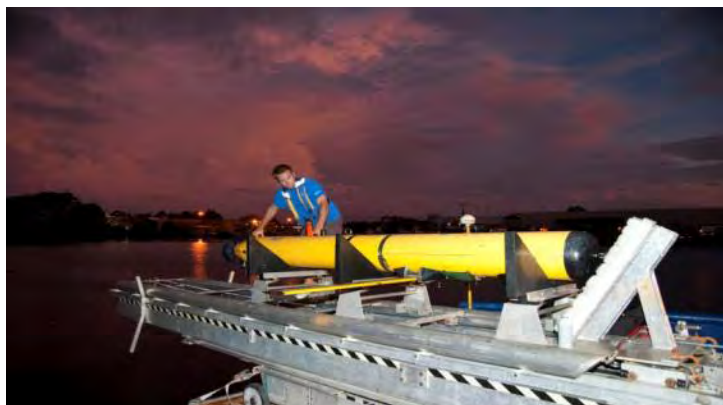
Small Synthetic
Aperture Minehunter



RFID

Back to the Future

The Dahlgren Clock still Tickin'...



Intellectual Capital of the Navy... Yesterday... and Today...





Definitions

Criteria for In-House Performance	Criteria for Outsourcing
<p>Technical Authority: Is the work specifically required to establish technical standards, tools and processes; and to ensure adherence to those standards? Does the work require an independent evaluation and certification of suitability or effectiveness of warfighting solutions with respect to stated requirements?</p>	<p>Design and Build: Is the work appropriate for industry to perform; i.e., it involves support to the government decision making roles, it exceeds the level needed to right size the in-house technical capability, and meets the following conditions:</p> <ul style="list-style-type: none"> • Is a commercially available function/service • The commercial source has a good track record • The market is sustainable over time (sufficient workload and profit incentive for industry) • The work has a definable outcome or product and is measurable
<p>Smart Buyer: Does the work require delegated or derived authority and the resources to initiate actions or activities? Does this work involve selecting and authorizing a contractor/governmental entity to produce military products or services?</p>	
<p>Independent Assessment: Is the work needed based on the delegated or derived authority plus the ability to judge the absolute or relative worth, quality or value of an activity, product or process relative to national security requirements?</p>	
<p>Avoid Technical Surprise (Innovation): Is the work needed to advance a critical warfighting capability that is needed but does not exist today, and for which no private sector entity is willing to invest? Is the work needed to provide solutions to complex technical problems for which government must have a strong technical understanding and involvement? Does the work needed to anticipate and respond to current and future National needs?</p>	
<p>Technical Pipeline: Will this work provide “hands-on” engineering design and development experience necessary to grow future inherently governmental technical decision makers (smart buyers, honest brokers, technical authority warrant holders)? Will this work help to sustain knowledge areas critical to a needed in-house technical capability?</p>	<p>Unique Skills/Capabilities: Is Industry the only source for this work and is there no compelling reason to establish a government source as an insurance policy in the case of a national crisis? Does industry provide needed skills/capabilities that are critical to the successful completion of this task and are not available in government?</p>
<p>Last Source: Does the work require access to unique or national facilities that are not available in Industry (due to the associated facility maintenance and modernization costs)? Is industry not able to perform is work (due to issues of propriety, security, or special expertise only available in government)?</p>	
<p>High Risk: Is there a high risk of contractor default? Is there high risk to warfighting capability should the contractor default? Is industry unwilling to accept the work because they are unwilling to accept potential liabilities? Does the work ensure interoperability of warfare systems and integrated warfighting capability?</p>	
<p>Not profitable: Is the work not able to be performed by a private sector source due to profitability issues by the private sector</p>	
<p>Work For Private Party: Is the work within your mission area and being requested by a contractor because no similar capability exists in the private sector; and can be defined by a one-time product or service with a specific deliverable?</p>	
<p>Best Value: Can results be achieved soonest by employing the Government source while maintaining the least cost and delivering the greatest overall value?</p>	<p>Best Value: Is this work available in the private sector and is Industry the best value in terms of cost, schedule and performance?</p>
<p>Economic Viability: Will performing this work in-house help to sustain a needed, but fragile National asset, technical capability and/or Warfare Center Division.</p>	<p>Economic Viability: Is this work needed to sustain critical assets that fragile in the private sector.</p>



**Preparing for the future....
Never forgetting the past!**

**16th Annual Expeditionary Warfare
Conference
“Integrating Future and Present
Capabilities”
ONR/Advance Technology**

Presented by
Mr. George W. Solhan, SES
Deputy Chief of Naval Research
26 October 2011



Expeditionary Warfare & Combating Terrorism
S&T Department
Code 30

DEVELOPING FUTURE NAVAL COMBAT CAPABILITIES

USMC USN

SMALL UNIT EXCELLENCE
LETHALITY, SUSTAINMENT,
HUMAN PERFORMANCE, AND
COMBAT LOAD REDUCTION
TECHNOLOGIES FOR NAVAL
WARRIORS

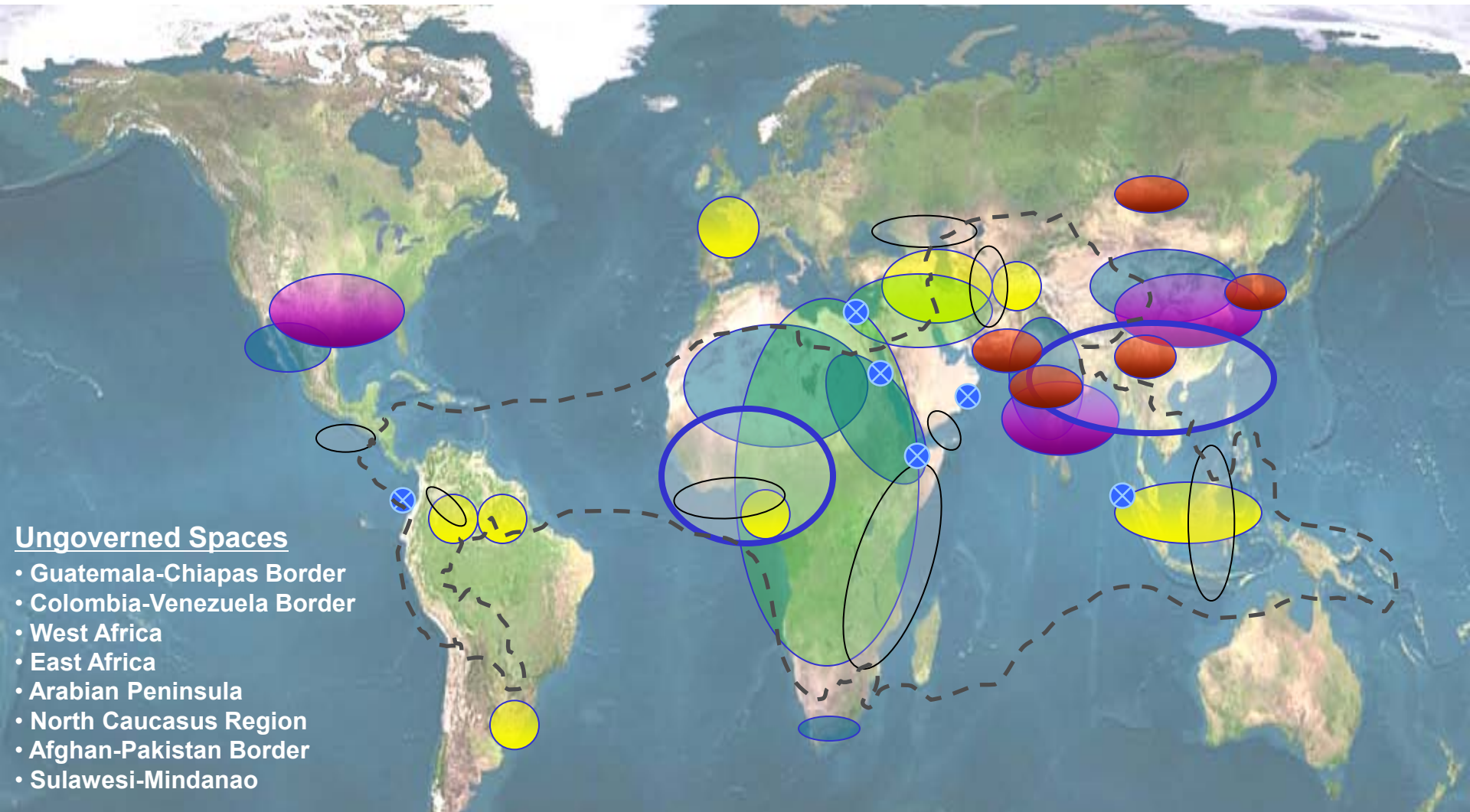
MARITIME IRREGULAR WARFARE
NAVAL EXPEDITIONARY
COMBAT TECHNOLOGIES FOR
COMBATING TERRORISM AND
DEFENDING THE HOMELAND

COMBAT TACTICAL VEHICLES
ADVANCED MOBILITY AND
ARMOR TECHNOLOGIES FOR
ENHANCED MANEUVER AND
SURVIVABILITY

DISTRIBUTED OPERATIONS
INTELLIGENCE, SURVEILLANCE,
AND CP TECHNOLOGIES FOR
LITTORAL DOMAIN AWARENESS

ONR
OFFICE OF NAVAL RESEARCH

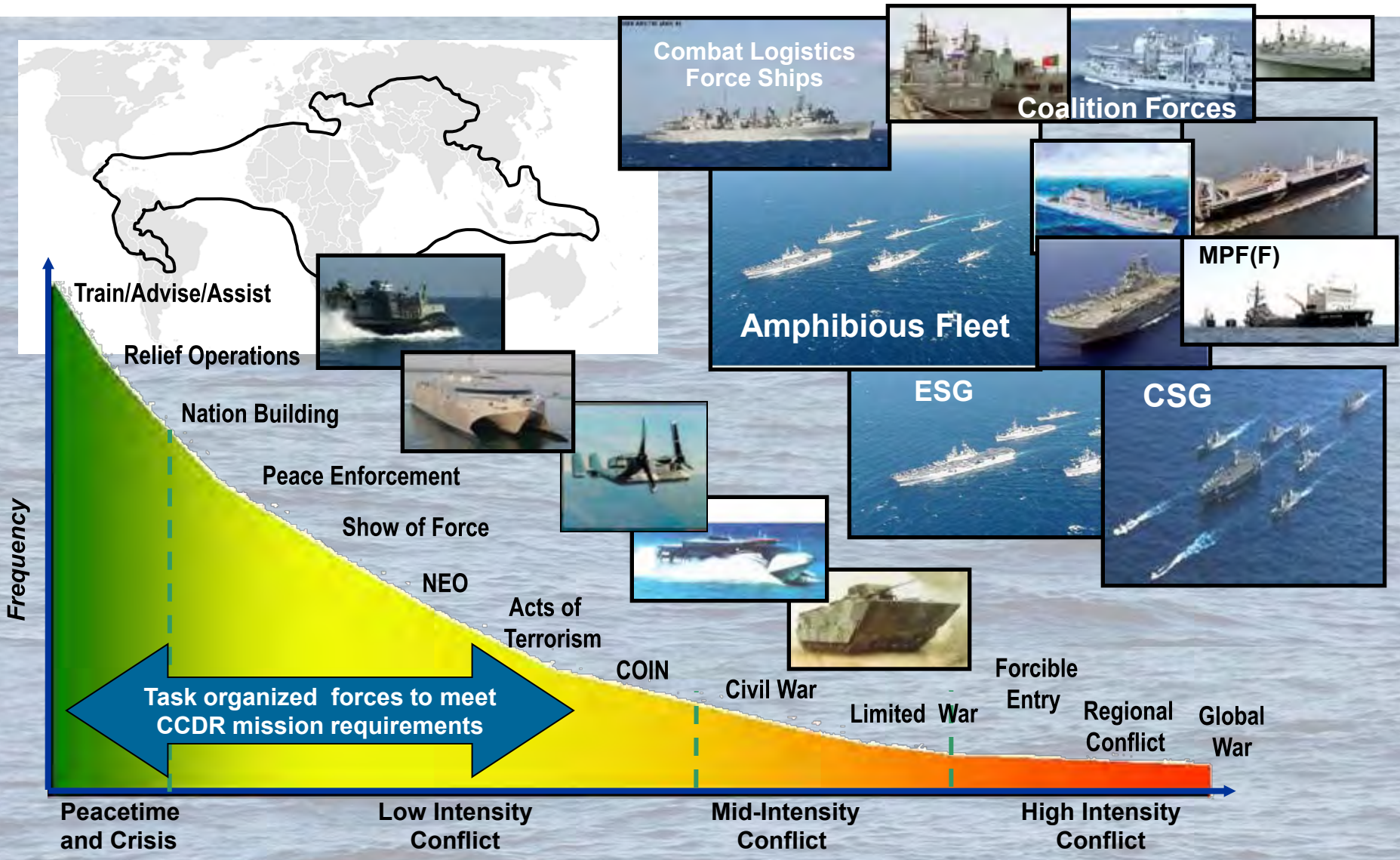
Sources of Stress, Instability & Conflict



- Ungoverned Spaces**
- Guatemala-Chiapas Border
 - Colombia-Venezuela Border
 - West Africa
 - East Africa
 - Arabian Peninsula
 - North Caucasus Region
 - Afghan-Pakistan Border
 - Sulawesi-Mindanao

Urban Stress	Youth Bulge	Terrorism/Crime	Ungoverned	Energy Demand	Nuclear	Water Stress	Choke points

Naval Expeditionary Operations



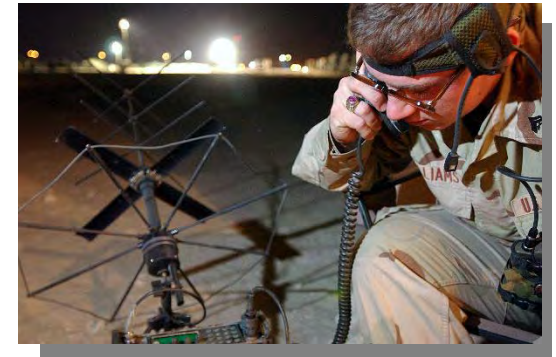
Technological Dominance



Laser-Guided Munitions

Today, Marines and Sailors have at their disposal the world's most sophisticated military technology

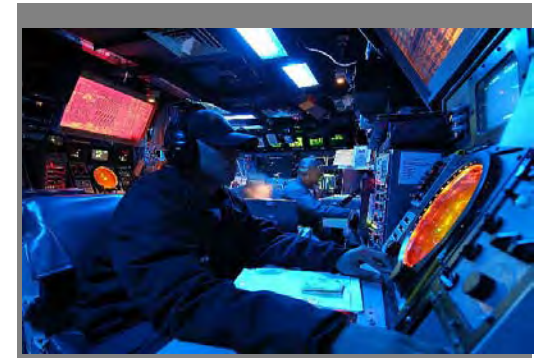
But....., our adversaries do, as well.



Mobile Communications



GPS Navigation and Targeting



Network-Centricity, Information Warfare, and Intelligence

The Ultimate Customer – The Warfighter!

ONR S&T enables Sailors and Marines!

- S&T in support of Expeditionary Maneuver Warfare (continued primary importance to both Navy and Marine Corps)
- S&T in support of Combating Terrorism – aka Maritime/Irregular Warfare (MIRWAR), GWOT, Long War, etc. (rapidly growing emphasis in both Navy and Marine Corps)
- Be more lethal; be more resilient, be pro-active (not reactive)
- Expand Small Unit area of influence & support logistically
- Be flexible in all phases of warfare (ROMO)
- Move between kinetic and non-kinetic tactics
- Predict actions of Irregular enemies
- Operational Adaptation in paradigm of Hybrid Complex Warfare
- Lighten the Load
- More Energy Efficient
- Autonomous systems for the “Grunt”
- Prepare for emergence of peer/near-peer competitors
- Project power in access denied environments
- Survive and Win

ONR S&T Departments

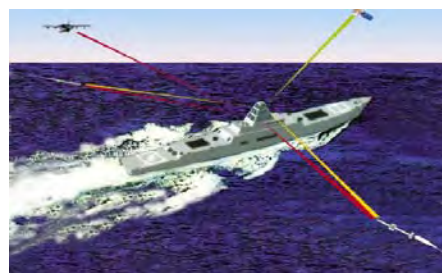
Code 30



**Expeditionary Maneuver
Warfare & Combating Terrorism**

Code 31

C4ISR



Code 32

Ocean Battlespace Sensing



Sea Warfare and Weapons



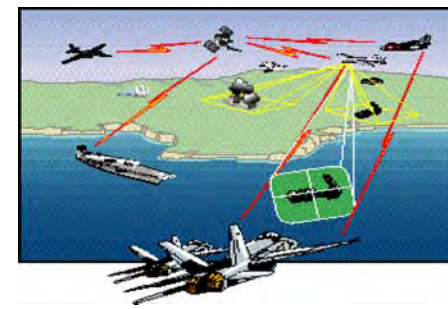
Code 33

Warfighter Performance



Code 34

Air Warfare and Weapons



Code 35

Focus on the warrior as a system, rather than the platform!

Align:
 -What we do
 -What we need to do it
 -How do we measure our effectiveness?

Align with our customers:
 - USMC, NECE, SPECWAR
 - Combat Developers, Material Developers, Operating Forces

Department Head
 Mr. G. W. Solhan

Deputy
 Programming, Planning &
 Operations
 Ms. L. Worcester

Deputy
 Department Head
 COL Sam Kirby

Hybrid Complex Warfare Sciences
 Division (301)
 Director
 Dr. R. Pohanka

Applications Division (302)
 Director
 Mr. A. G. Johnson

Combating Terrorism &
 Integration Division (303)
 Director
 Mr. J. McMains

Non-Linear Physics
 Dr. M. Shlesinger
 Basic Research
 Counter IED
 Dr. D. Prono
 CAPT Gunzel

NEDP
 Ms L. Albuquerque

Naval Expeditionary Dog Program

Maritime
 Irregular
 Warfare
 Operational
 Adaptation

CAPT C. Gunzel

Integrate inter departmental & interdisciplinary within ONR and with external activities

Human
 Performance
 Training &
 Education

C4

ISR

Fires

Logistics

Maneuver

Force
 Protection

Human,
 Social,
 Cultural,
 Behavioral
 Sciences

Mr. Lethin
 Mr. Squire

Mr. J. Moniz

Mr. M. Kruger
 Ms. M. Rubeiz
 Maj F. Filler

Mr. D. Simons
 Mr. G. Thorsted

Mr. C. Anderson

Mr. J. Bradel (ICAF)
 Maj Billy Short (Aug 11)
 Mr. K. Hammack

Mr. L. Mastroianni

Dr. I. Estabrooke

Aligning to Strategic Guidance

CNO

Priorities and Guidance

- Build the Future Force
- Maintain Warfighting readiness
- Leverage Science and Technology (S&T) initiatives to ensure Warfighting benefits accrue to future Sailors
- Develop & Support Our Sailors, Civilians and Families
- Lead STEM education and outreach to grow top technical talent to lead tomorrow's Navy and double the Navy's STEM investment within five years

Commandant

Priorities and Guidance

- Provide the best trained and equipped Marine units to Afghanistan
- Rebalance and posture the Corps for the future and aggressively experiment with and implement new capabilities and organizations
- Better educate and train Marines to succeed in distributed operations and increasingly complex environments
- Keep faith with our Marines, our Sailors and our families

SECNAV

Priorities

- Taking care of our Sailors, Marines, Civilians, and their Families
- Treating energy in DON as an issue of national security
- Creating acquisitions excellence
- Optimizing unmanned systems

CNR

Naval S&T Strategic Plan

9 S&T Focus Areas

- Assure Access to Maritime Battlespace
- Autonomy and Unmanned Systems
- Expeditionary & Irregular Warfare
- Information Dominance
- Platform Design & Survivability
- Power and Energy
- Power Projection & Integrated Defense
- Total Ownership Cost
- Warfighter Performance

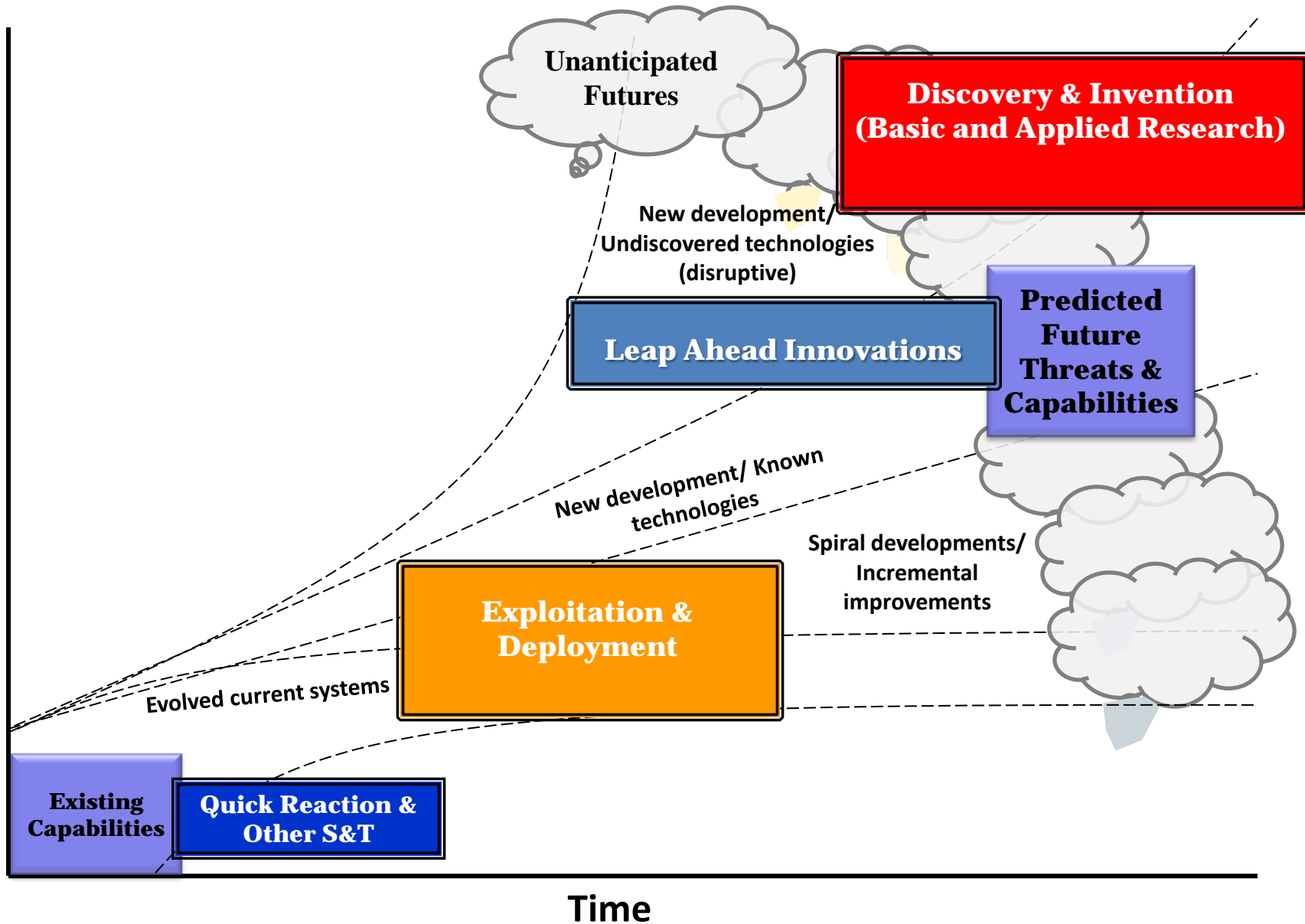
Science, Technology, Engineering, & Mathematics (STEM)

Science and Technology (S&T), and Experimentation for the Future Middle Weight Force

- *“A **middleweight force**, we are light enough to get there quickly, but heavy enough to carry the day upon arrival, and capable of operating independent of local infrastructure.”*
- *“We will rebalance our Corps, posture it for the future and **aggressively experiment** with and **implement new capabilities** and organizations.”*
- *“We will better educate and train our Marines to **succeed in distributed operations** and increasingly complex environments.”*

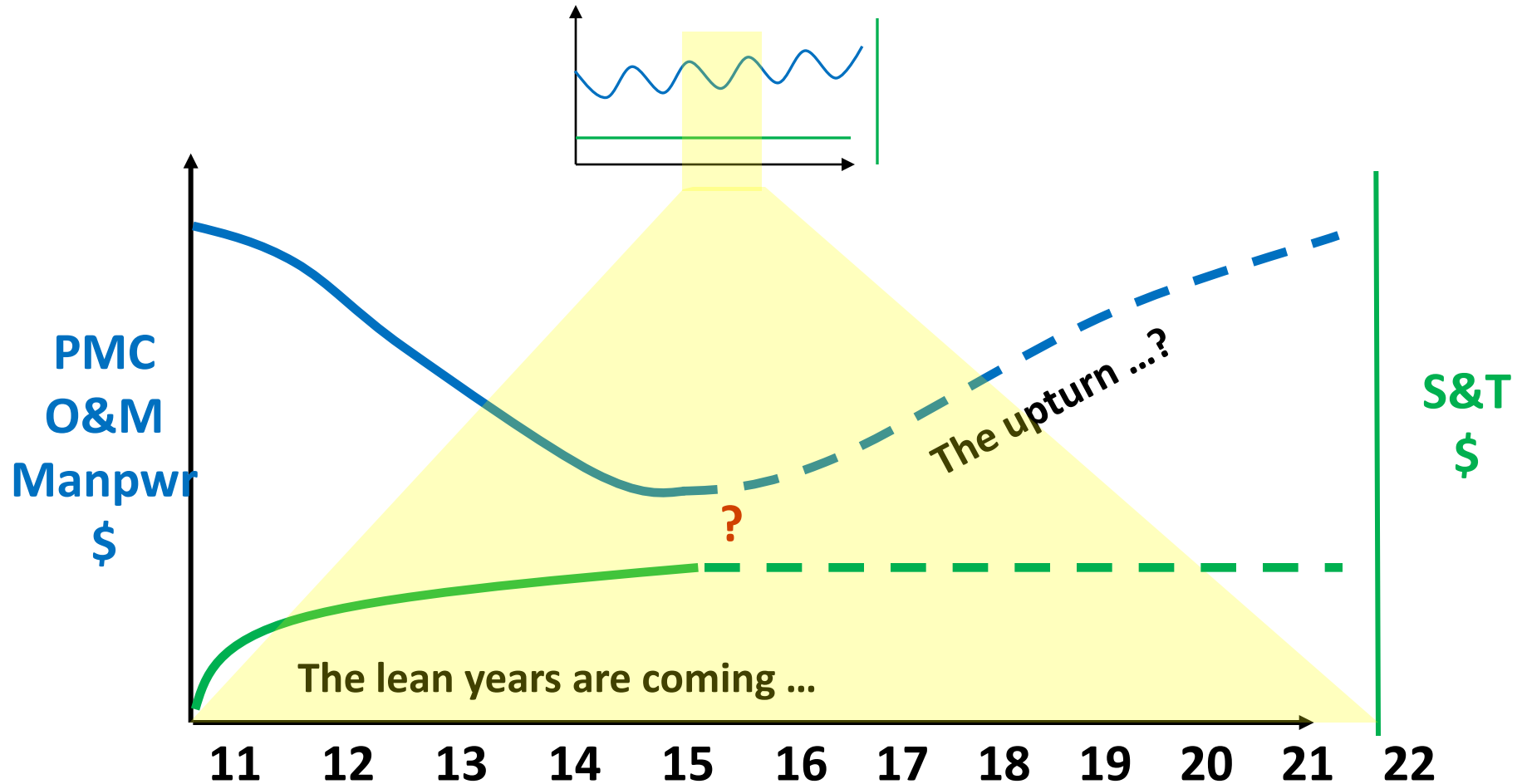
Portfolio Alignment with Futures

Complexity...Uncertainty...Wartighting Capability



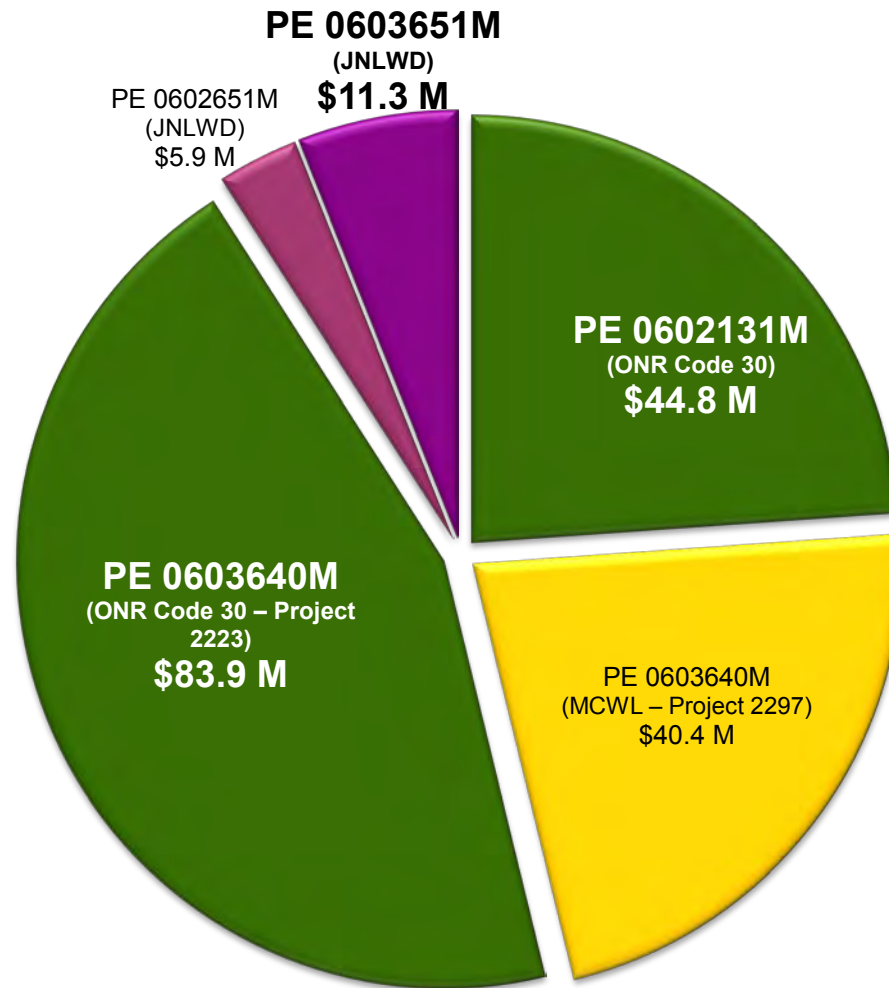
S&T/Experimentation Opportunity

“When you have no money, THINK”



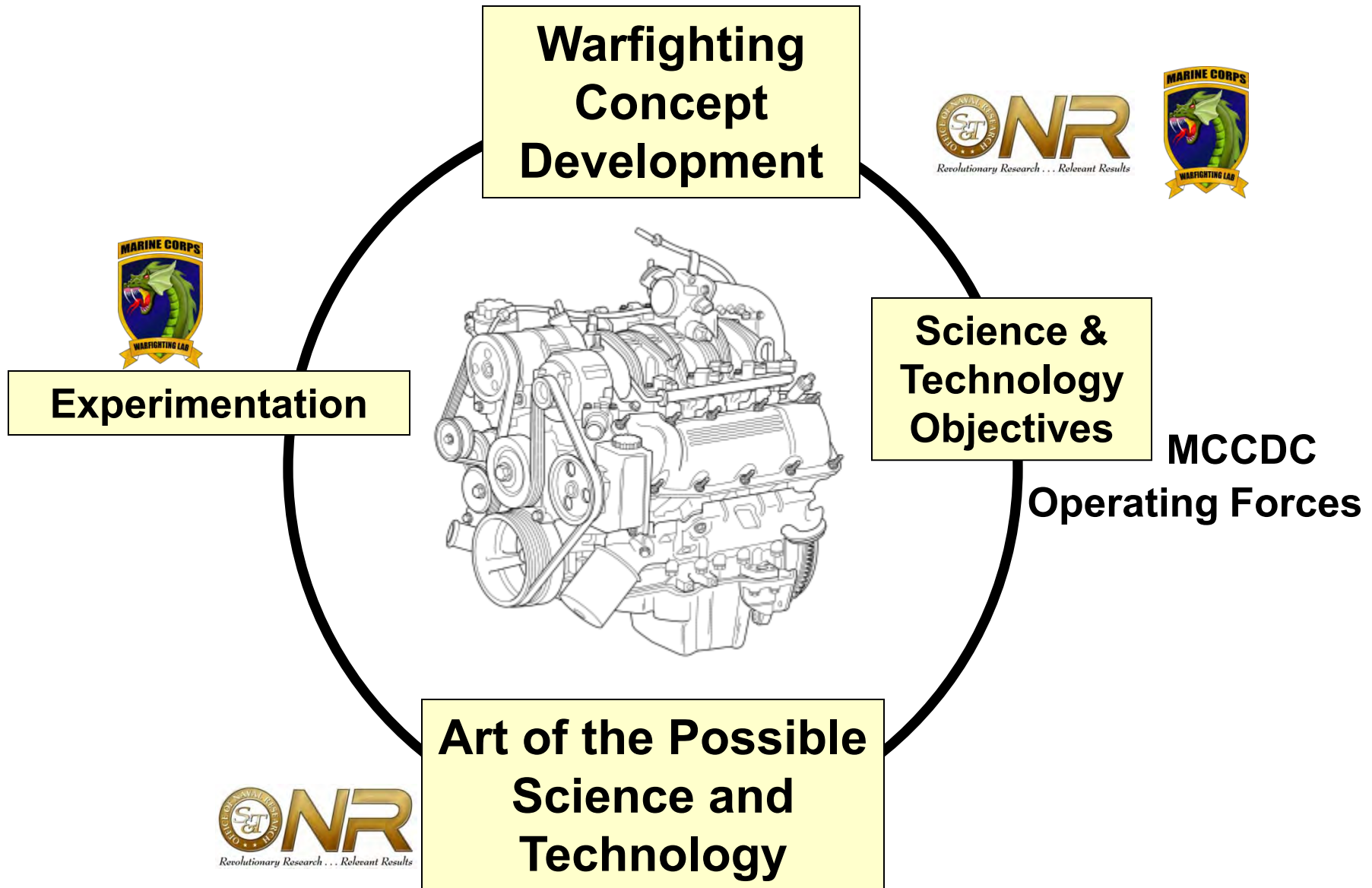
- When procurement funding is plentiful, S&T/Exp is important
- Shape the nature of the buy When procurement funding is scarce, S&T/Exp is more important
- Mitigate Risk with the Creative Engine – Know What is Possible... and When
- Shape future capability – be prepared to take advantage of opportunities when the upturn comes

PBR FY-12 S&T Funding (Total \$186.3M)



Data derived from PBR FY-12

Creative Engine for Combat Development



Expeditionary Maneuver “Whitman’s Sampler”

Technology Investment Areas

Thrust Areas

Maneuver

Survivability – Armored Materials
Active Pulsed Power Protection
Crew Protection

Active / Pulsed Power Protection

Advanced Requirements for Crew Safety (ARCS)

Advanced Electromagnetic Armor (AEMA)

Advanced Blast Mitigation

Maneuver Enablers –SA & Unmanned Autonomous Systems



Advanced Perception System



Autonomous Wingman - Resupply Vehicle

Advanced Mobility – Advanced Suspension & Drive Train Technologies
Fuel Efficiency & Battlefield Power

Infinitely Variable Transmission



Fuel Efficient MTRV & Advanced LAV Suspension System (FNCs)

Future Fuel Alternatives

Detection
(Point/Standoff/Area)

GPR
Syntactic Landmine Detection

Suicide Bomber Detection

Shearography Detection

Multi-Mode & Remote Standoff Explosive Detection

Multi-Modal Pre-Shot Sniper Detection

EMW-FY08-01 Demo/Transition

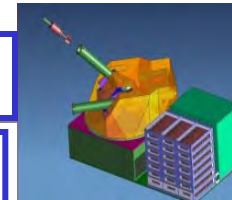
Neutralization
(Point/Standoff/Area)

Neutralization of IEDs with RF

Spot / Scalable Explosive Hazard Neutralization



Smart Mine Sensor Counter Measures



Laser -Based Air & CRAM Defense

Mitigation



EMW-FY09-01
Indiv. Warfighter Protection



Blast/Trauma Mitigation For Combat Helmets

Ultra High Strength & Performance Ballistic Materials

Blast Mitigation Technologies



Enhanced Physical Readiness

Nutritional Modulators of Physiological Adaptation & Performance

Enhanced Technologies for Optimization of Warfighter Load



Integrated Models for Warfighter Performance Enhancement

Mental Resilience & Cognitive Agility

UGV Man-Machine Interface & Workload, Stress & Performance in IIT



Neural Mechanisms of Mental Skills Resilience & Expressive Interactions for Desktop VE

Technologies Supporting Peak Cognitive Performance

Expertise Development

Small Arms /Marksmanship Training & Smart Tutoring

Naval Next-generation Immersive Technology & Autonomous Robotic Target Systems



Applied Technologies for SITE & Neuroadaptive Training

Near Term

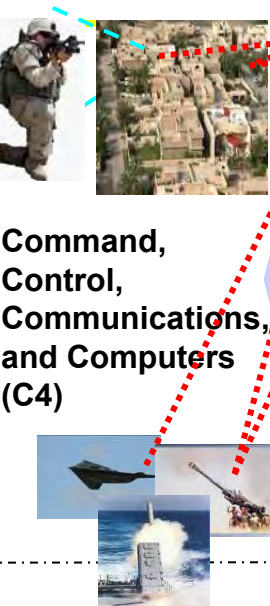
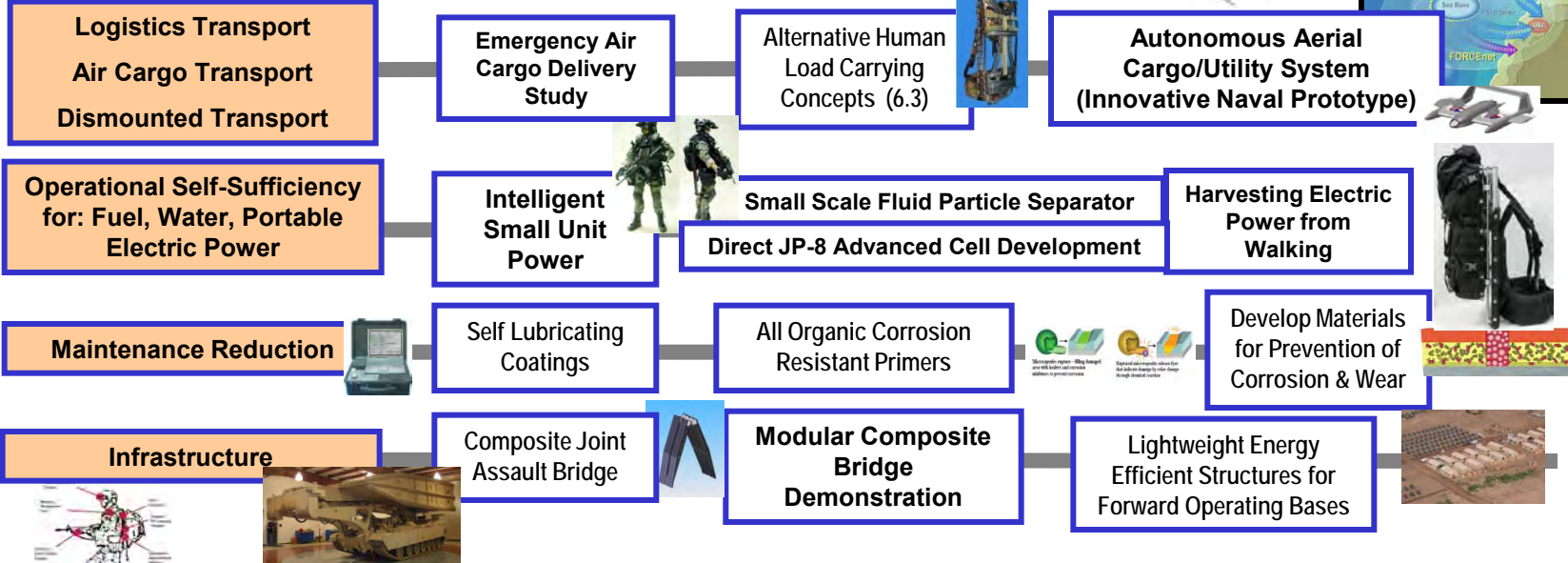
Mid Term

Far Term

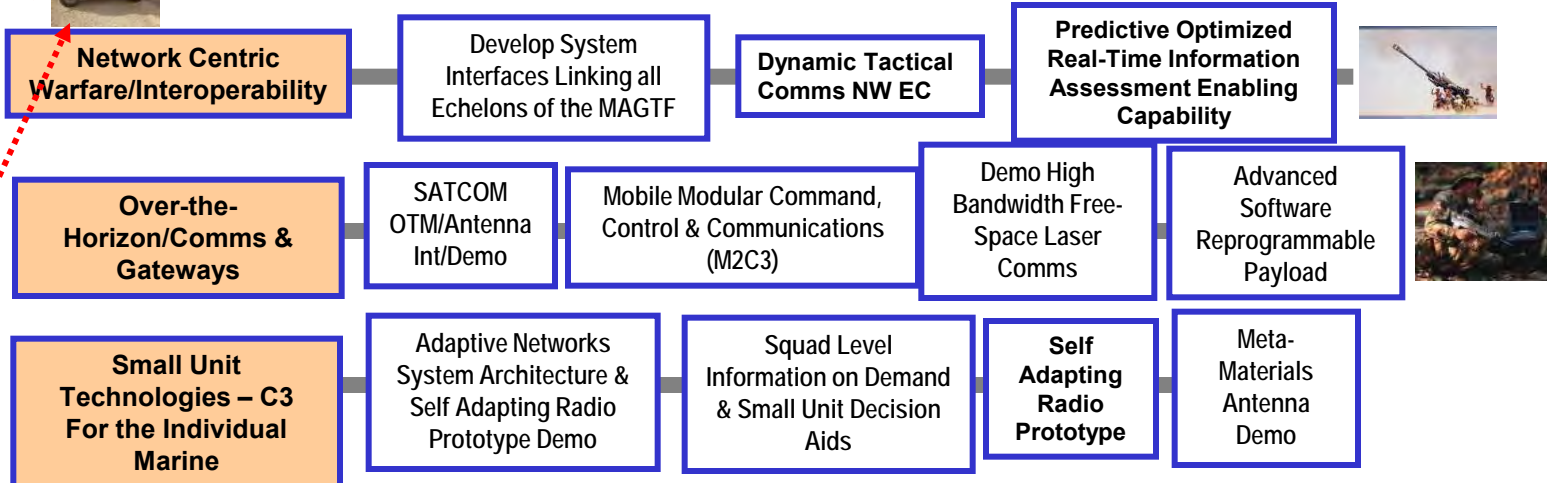
Expeditionary Maneuver “Whitman’s Sampler”

Thrust Areas

Technology Investment Areas



Command, Control, Communications, and Computers (C4)

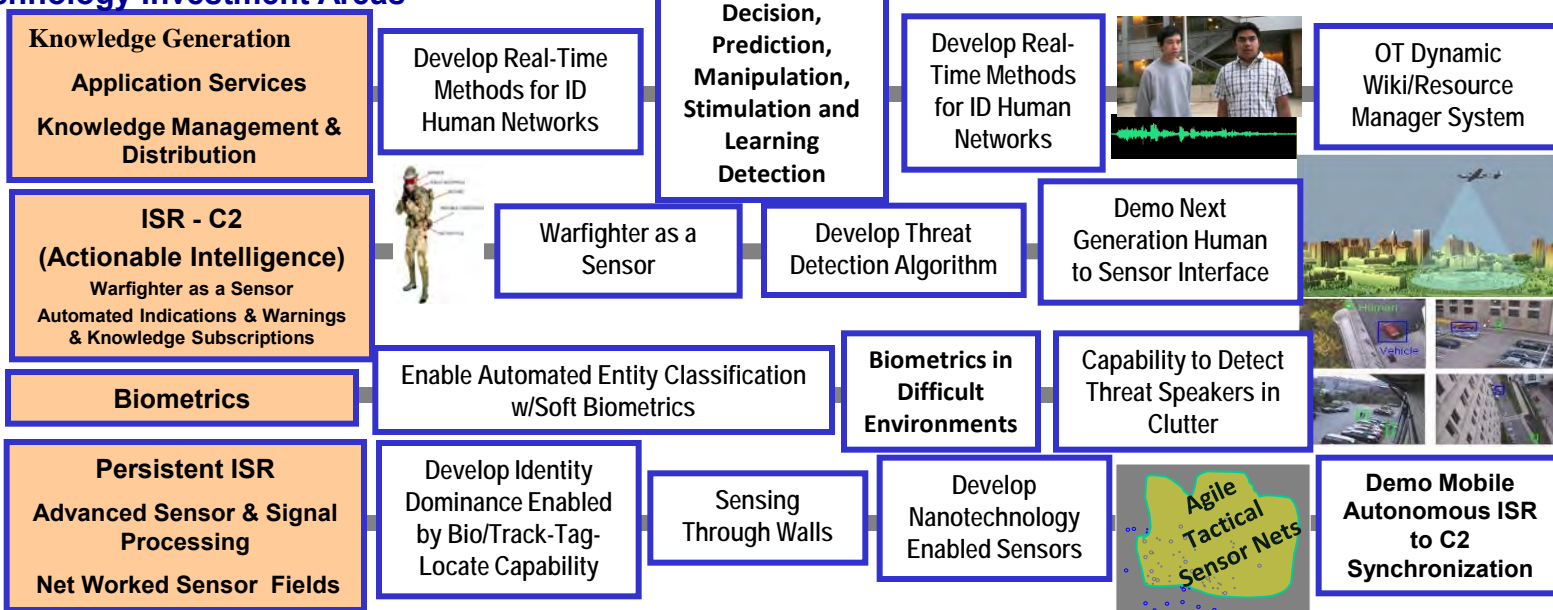


Expeditionary Maneuver "Whitman's Sampler"

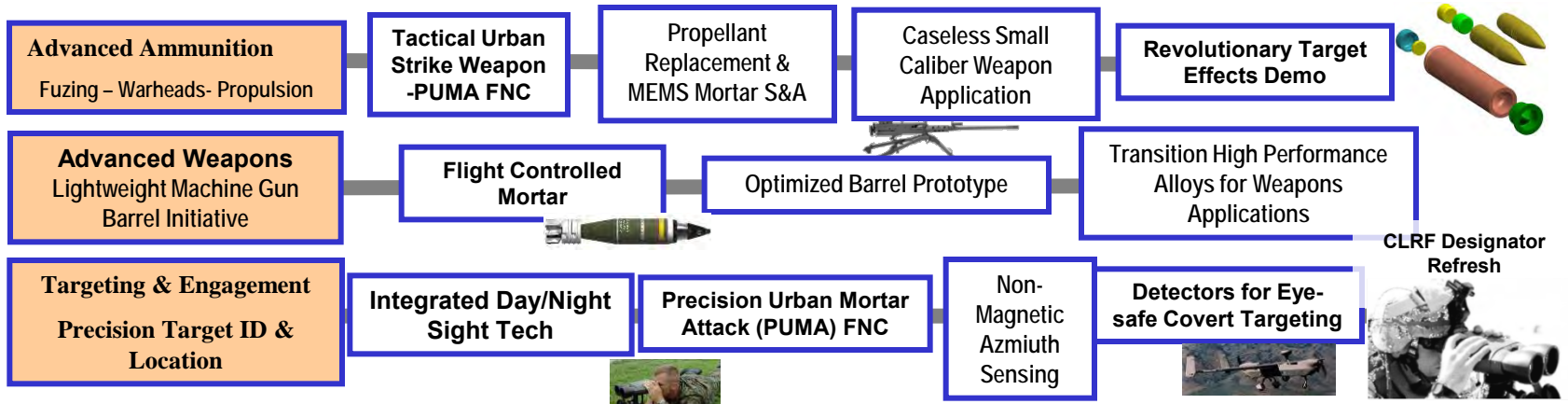
Technology Investment Areas

Thrust Areas

Intelligence, Surveillance & Reconnaissance (ISR)



Firepower



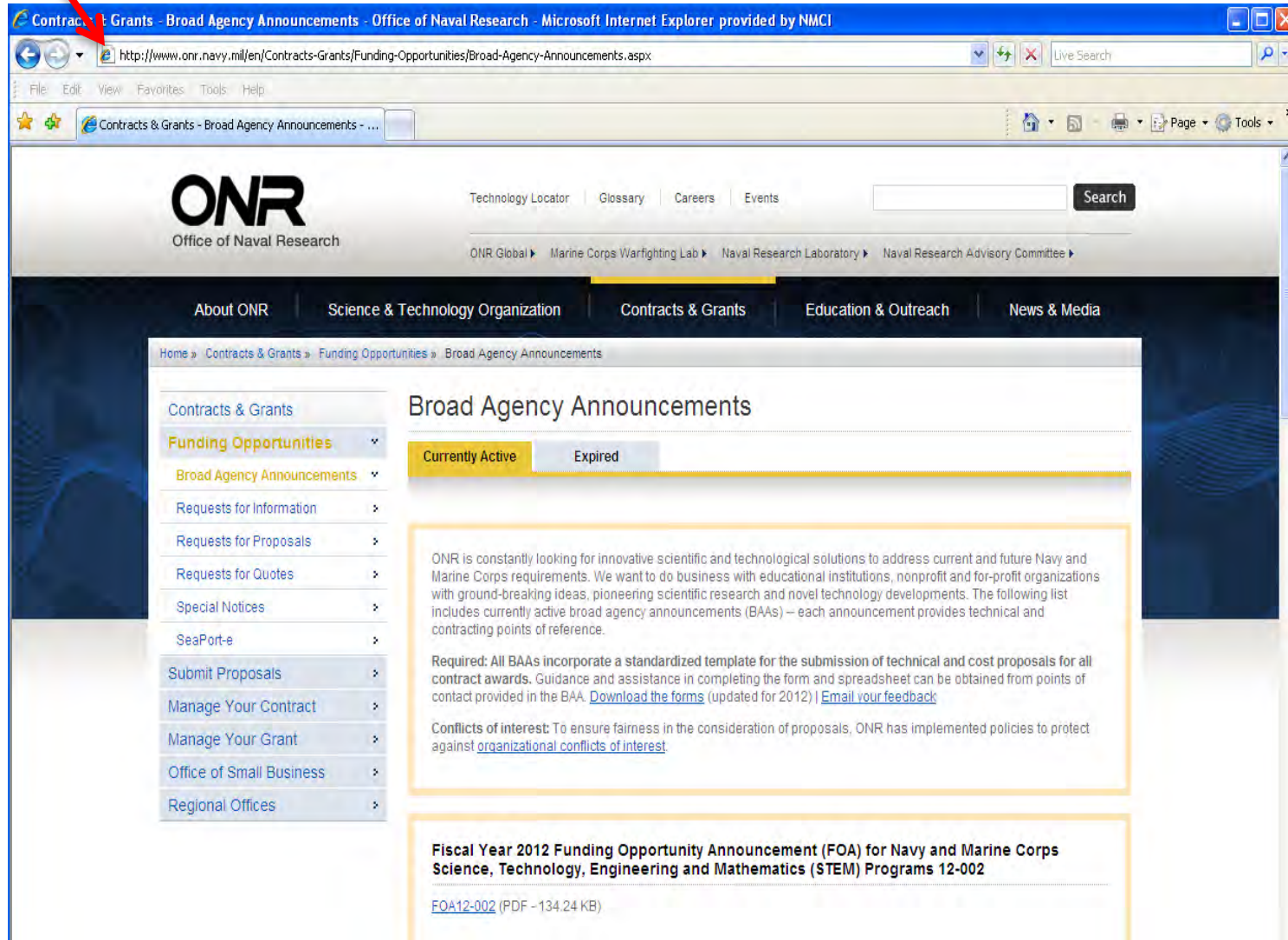
Littoral Combat/ Power Projection



Quo Vadis?

- **Risk reduction for an uncertain future.**
- **Lessons Learned from 10 years of irregular warfare.**
- **Must investigate new emerging areas such as autonomy, cyber, spectrum dominance**
- **Return technology focus to Corps' historical mission**
- **Must enhance the Corps' Global Reach and tactical agility through Full Spectrum (ROMO) ops, Energy Efficiency, Distributed Operations, Lightening the Combat Load/footprint, and Naval character.**

<http://www.onr.navy.mil/en/Contracts-Grants/Funding-Opportunities/Broad-Agency-Announcements.aspx>



The screenshot shows a Microsoft Internet Explorer browser window displaying the ONR website. The address bar contains the URL: <http://www.onr.navy.mil/en/Contracts-Grants/Funding-Opportunities/Broad-Agency-Announcements.aspx>. The page features the ONR logo and navigation menus. The main content area is titled "Broad Agency Announcements" and includes a sidebar with a "Funding Opportunities" dropdown menu. The main text describes the current search results, which are filtered to "Currently Active" announcements. A large text box provides information about the submission process, including a link to "Download the forms" and "Email your feedback". Below this, a section titled "Fiscal Year 2012 Funding Opportunity Announcement (FOA) for Navy and Marine Corps Science, Technology, Engineering and Mathematics (STEM) Programs 12-002" is visible, with a link to the FOA document.

ONR
Office of Naval Research

Technology Locator | Glossary | Careers | Events

ONR Global | Marine Corps Warfighting Lab | Naval Research Laboratory | Naval Research Advisory Committee

About ONR | Science & Technology Organization | **Contracts & Grants** | Education & Outreach | News & Media

Home » Contracts & Grants » Funding Opportunities » Broad Agency Announcements

Contracts & Grants

Funding Opportunities

Broad Agency Announcements

Requests for Information

Requests for Proposals

Requests for Quotes

Special Notices

SeaPort-e

Submit Proposals

Manage Your Contract

Manage Your Grant

Office of Small Business

Regional Offices

Broad Agency Announcements

Currently Active | Expired

ONR is constantly looking for innovative scientific and technological solutions to address current and future Navy and Marine Corps requirements. We want to do business with educational institutions, nonprofit and for-profit organizations with ground-breaking ideas, pioneering scientific research and novel technology developments. The following list includes currently active broad agency announcements (BAAs) – each announcement provides technical and contracting points of reference.

Required: All BAAs incorporate a standardized template for the submission of technical and cost proposals for all contract awards. Guidance and assistance in completing the form and spreadsheet can be obtained from points of contact provided in the BAA. [Download the forms](#) (updated for 2012) | [Email your feedback](#)

Conflicts of interest: To ensure fairness in the consideration of proposals, ONR has implemented policies to protect against [organizational conflicts of interest](#).

Fiscal Year 2012 Funding Opportunity Announcement (FOA) for Navy and Marine Corps Science, Technology, Engineering and Mathematics (STEM) Programs 12-002

[FOA12-002](#) (PDF - 134.24 KB)

The glass is half full!



The glass is half empty.



Half full...No! Wait!
Half empty!..No, half...
What was the question?



Hey!
I ordered a cheeseburger!



Questions or Comments?

Ocean Battlespace Sensing Department

Enabling Revolutionary Naval Expeditionary Warfare Capabilities



Revolutionary Research . . . Relevant Results

***16th Annual Expeditionary Warfare Conference
Panama City, Florida***

26 October 2011

Tom Swean Jr. PhD

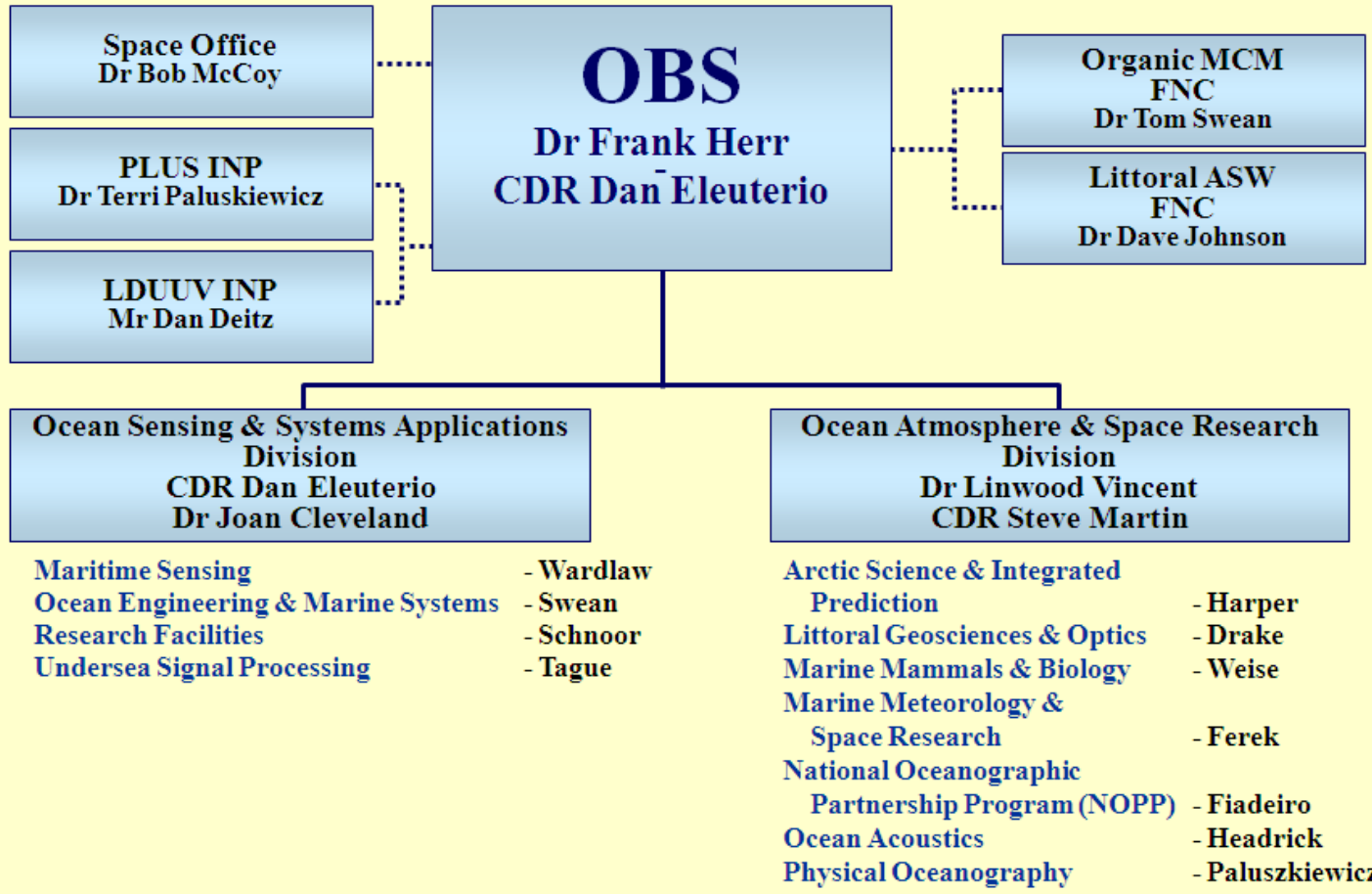
Team Leader, MIW Program (ONR 321)

Voice: (703) 696-4025 Fax: (703) 696-3390 sweant@onr.navy.mil



Office of Naval Research Ocean Battlespace Sensing

Ocean Battlespace Sensing S&T Department



Naval S&T Focus Areas

Assure Access to the
Maritime Battlespace

Autonomy and
Unmanned Systems

Expeditionary and
Irregular Warfare

Information
Dominance

Platform Design and
Survivability

Power and Energy

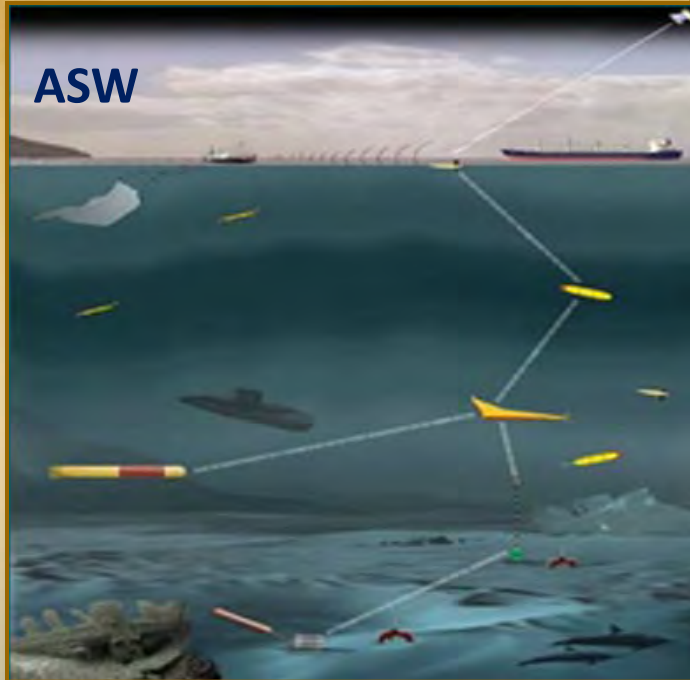
Power Projection and
Integrated Defense

Total Ownership Cost

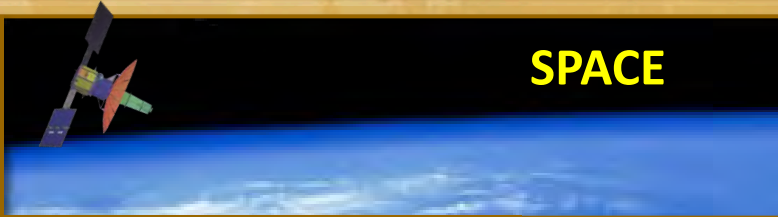
Warfighter
Performance

Operational Environments - ASW - MIW - Space Environment

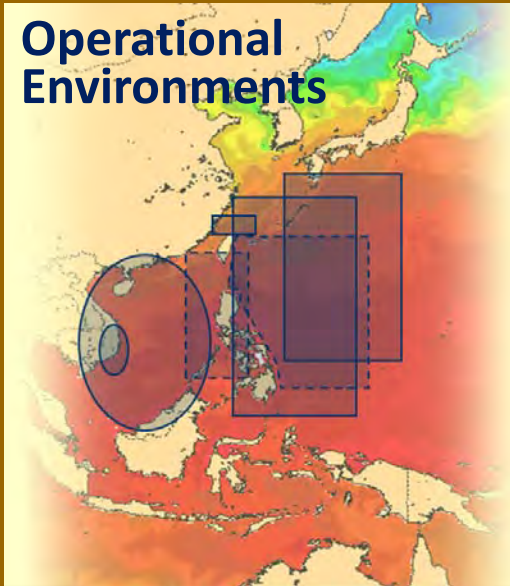
Areas of Responsibility



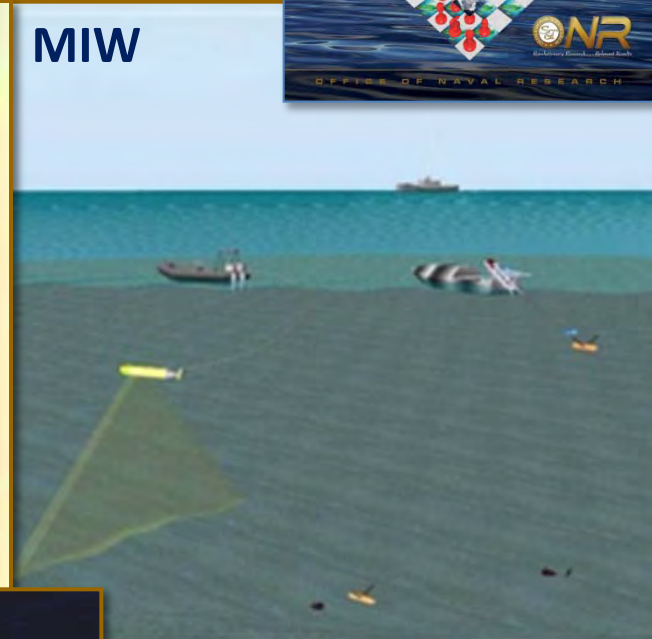
ASW



SPACE



Operational Environments



MIW



Marine Mammals



UUVs

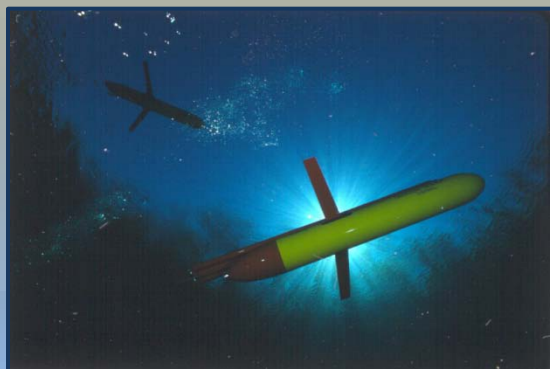
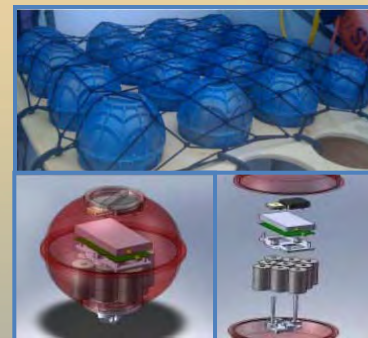


Research Vessels

Strategic Precepts

- Future Fleet ship and aircraft assets will continue to decline in number
- Personnel costs will drive efforts to reduce the number of operators for any given mission
- Acquisition dollars will be scarce – close coordination with the Fleet and acquisition authorities is essential to transition
- Networked, platform agnostic, autonomous distributed sensors and effectors will play an increasingly important role in naval operations

Overarching Theme Autonomous Sensors



TacSat-4 Mission Overview



Low-HEO Orbit
2+ Hour Dwell

C2 Link

UHF Bent-pipe (285 - 415 MHz)

Comms on the Move
Legacy (5 kHz/25 kHz), Networked,
Wideband (5 MHz)

Friendly Force Tracking

Data Exfiltration

NRL's Blossom Point
Ground Station,
Maryland



2000-4000 NM
Diameter FOV

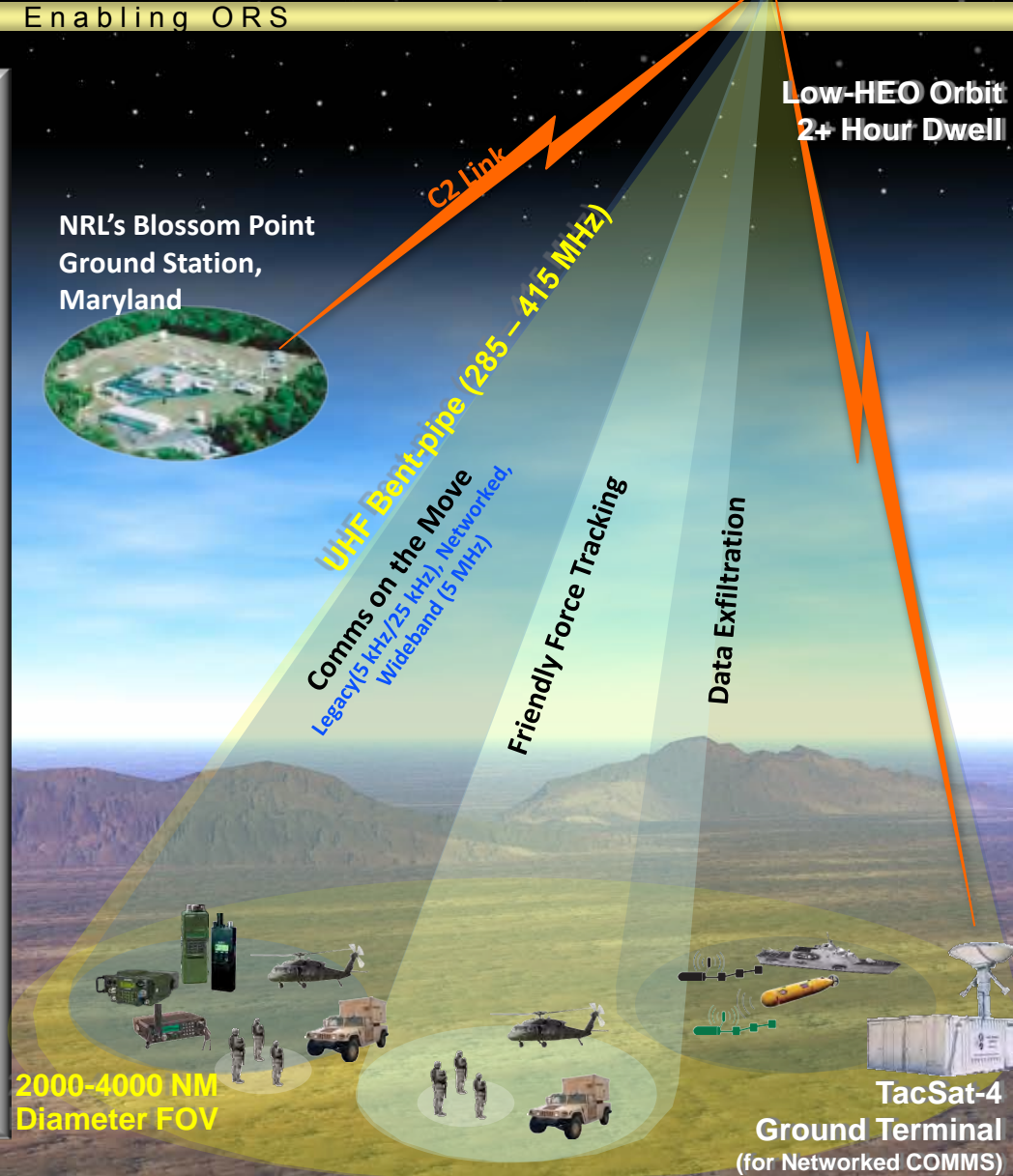
TacSat-4
Ground Terminal
(for Networked COMMS)

Augment National SATCOM with:

- 10 Legacy UHF Channels
- COMMS-on-the-Move without User Antenna Pointing
- Networked COMMS on SIPRNET
- A Single MUOS-like Wideband Channel for Early Testing
- UHF Blue Force Tracking (BFT), now "Friendly Force Tracking" (FFT), Collection in Underserved Areas
- Data Exfiltration from Unattended Ground and Maritime Sensors

Enable ORS Long Dwell Missions and Augment National Coverage with a Unique HEO Orbit

Support EMI Location Programs



Riverine Reconnaissance

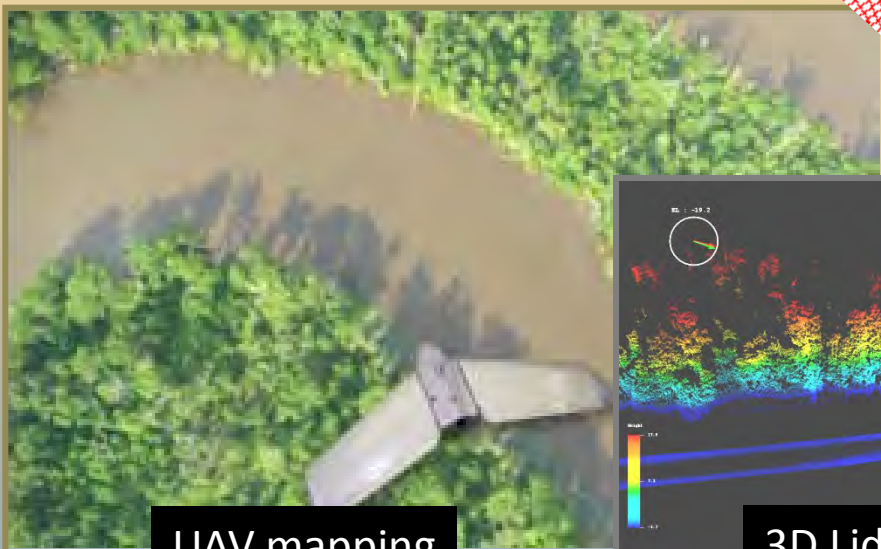
Assure access: riverine environments change rapidly – many locations not amenable to remote sensing

Uncertainty reduces optempo and greatly increases risk

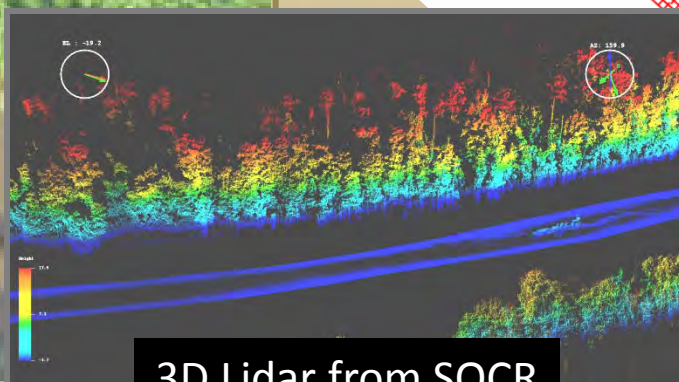
Must counter water and land threats simultaneously



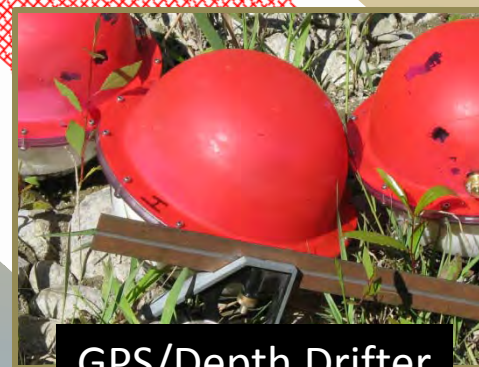
River depths from remote sensing



UAV mapping



3D Lidar from SOCR



GPS/Depth Drifter

Riverine reconn exploits satellite, UxV and in situ observations of river characteristics to provide predictive models for tactical decisions

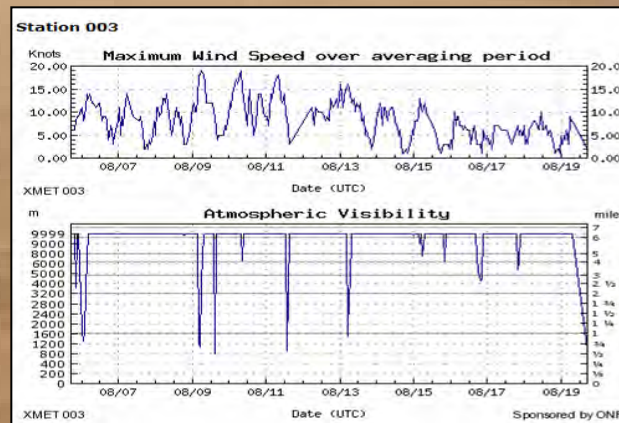
Expeditionary Meteorological Sensor

- A cooperative effort between the U.S. Office of Naval Research and U.S. Marine Corps to develop and test a rapidly-deployable, proof-of-concept meteorological sensor system to autonomously sense and report weather and visibility conditions at remote locations
- Provides situational awareness of rapid weather changes which impact local operations

XMet Sensor
Al Asad Air Base, Iraq
6/30/2008

Capabilities:

- Wind speed/direction
- Visibility
- Air temperature
- Relative humidity and dew point
- Barometric pressure (QNH/PA/DA)
- Global communications using SATCOMs
- Hourly weathergram transmitted via email
- Web interface to data and mapping of near real-time conditions
- Solar powered for unattended operation
- Based upon technology used in ocean buoys
- Low Cost



Data collection for validating and improving forecast models



Basic and Applied Research for Building the Navy's Environmental Prediction System

(The world's largest operational, integrated environmental prediction system)

WESTPAC Basic Environmental Research

Observations, Discoveries, Inventions

Develop/Improve 25+ Operational Prediction System Components

ONR Field Studies*

Impacts on Western Pacific Typhoon Predictability

Quantifying, Predicting, Exploiting Uncertainty

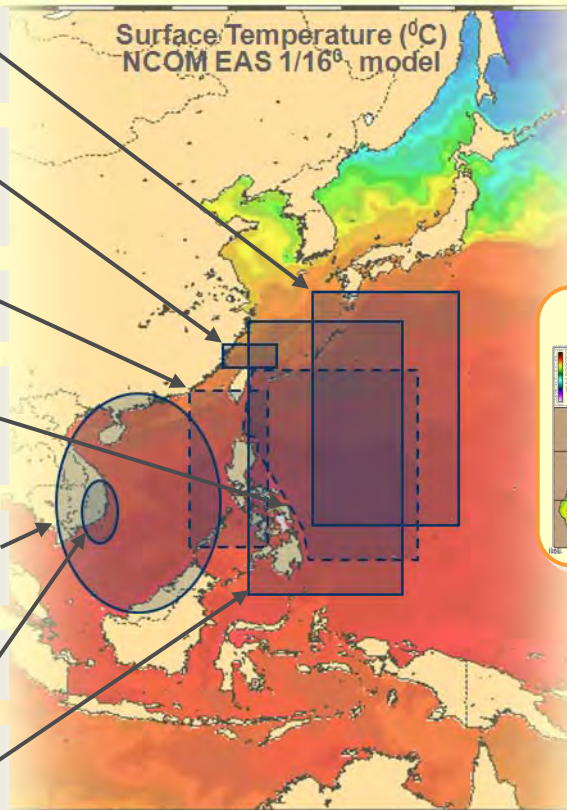
Internal Waves in Straits Experiment

Origins of the Kuroshiro and Mindanao Currents

Vietnamese Shelf and South China Sea Variability

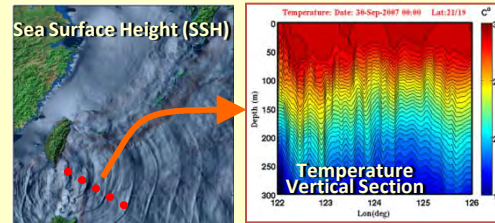
Remote Sensing of Deltas

Typhoon Impacts on the Western Pacific Ocean

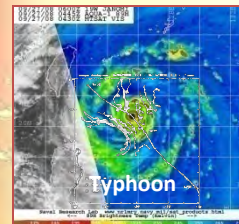
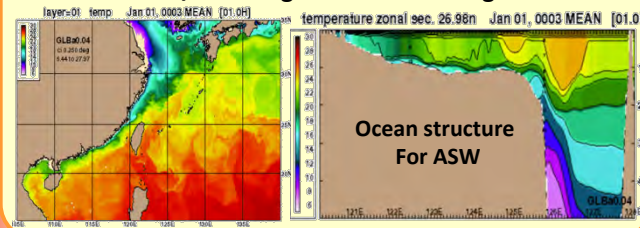


ONR Model Development

Internal Waves = Propagation Variability



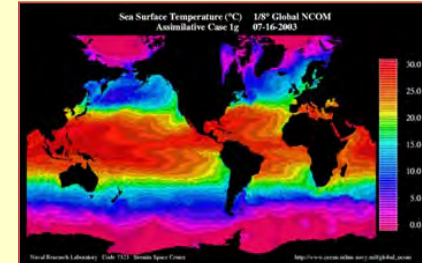
HYCOM 1/25th Degree Tide Resolving Model



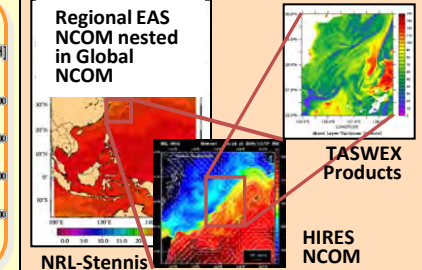
New technology



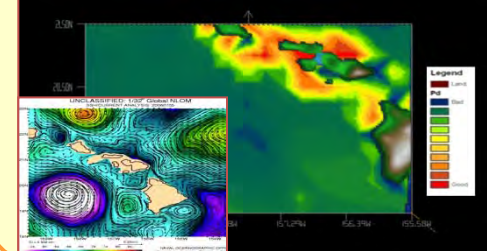
CNMOC Transitioned Predictions



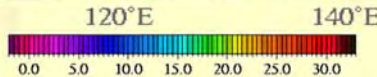
TASWEX-04 Nesting in East Asian Seas NCOM



Probability of Submarine Detection



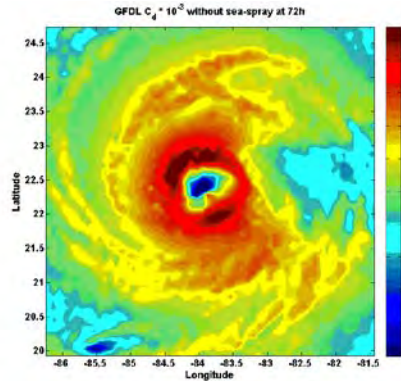
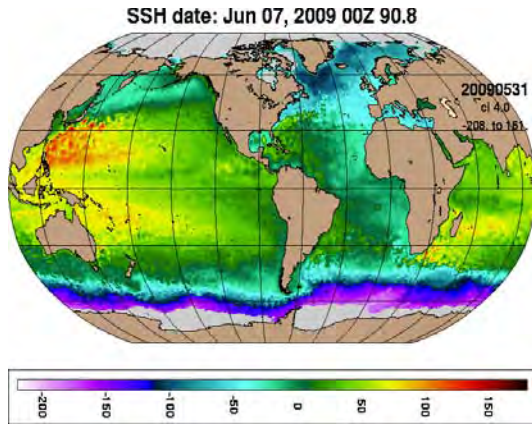
* Ongoing FY11



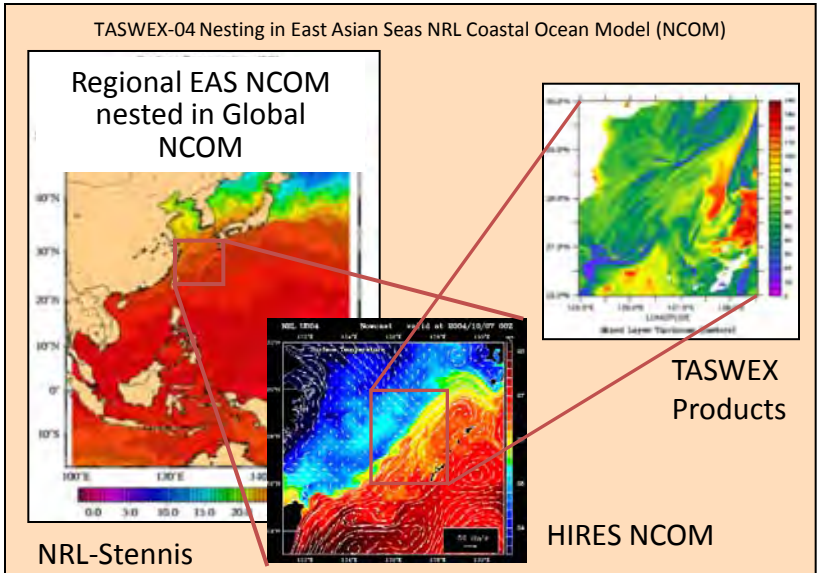
Navy R&D focus on OCONUS areas of special operational interest and for specific Warfare missions

FNMOCC & NAVOCEANO distribute 1000s of product sets per day to Support Navy and other DoD users in Peace and war.

Ocean and Atmosphere Models and Prediction Systems



High-resolution Regional and Coastal Prediction Systems

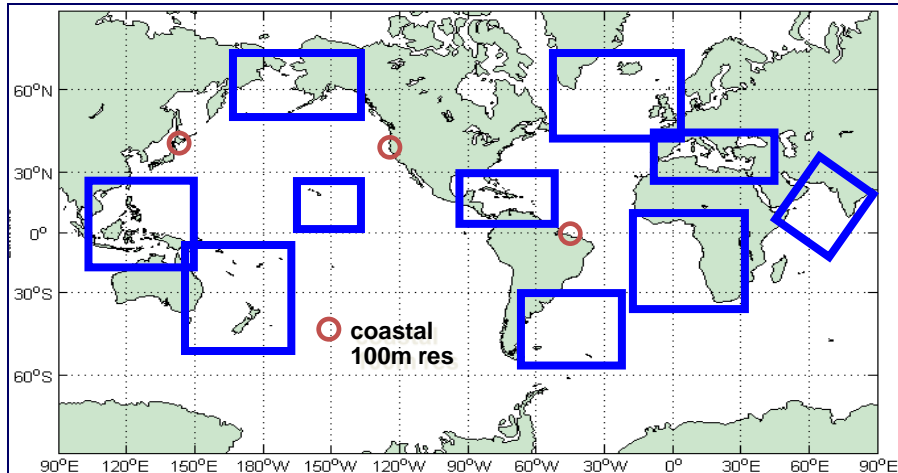


ONR S&T: Develop/Improve 25+ Operational Prediction System Components

- Research: Process studies,
Theory, Model Development:
- Ocean
 - Currents, Circulation
 - Waves, Surf
 - Mixing
 - Ice
 - Sediment Transport
 - Acoustics, Optics
 - Atmosphere
 - Global, Mesoscale
 - Tropical Cyclones
 - Dust, Visibility
 - EM/EO Propagation
 - Observation Systems
 - Advanced Data Assimilation

- Operations:
- Global ocean models
 - SWAFS
 - NLOM
 - GNCOM
 - GHYCOM
 - Regional ocean models
 - RNCOM
 - COAMPS
 - Coastal ocean models
 - WW3 (Waves)
 - Sea Ice
 - Atmosphere models
 - COAMPS
 - NAVGEM

Relocatable anywhere within the global system



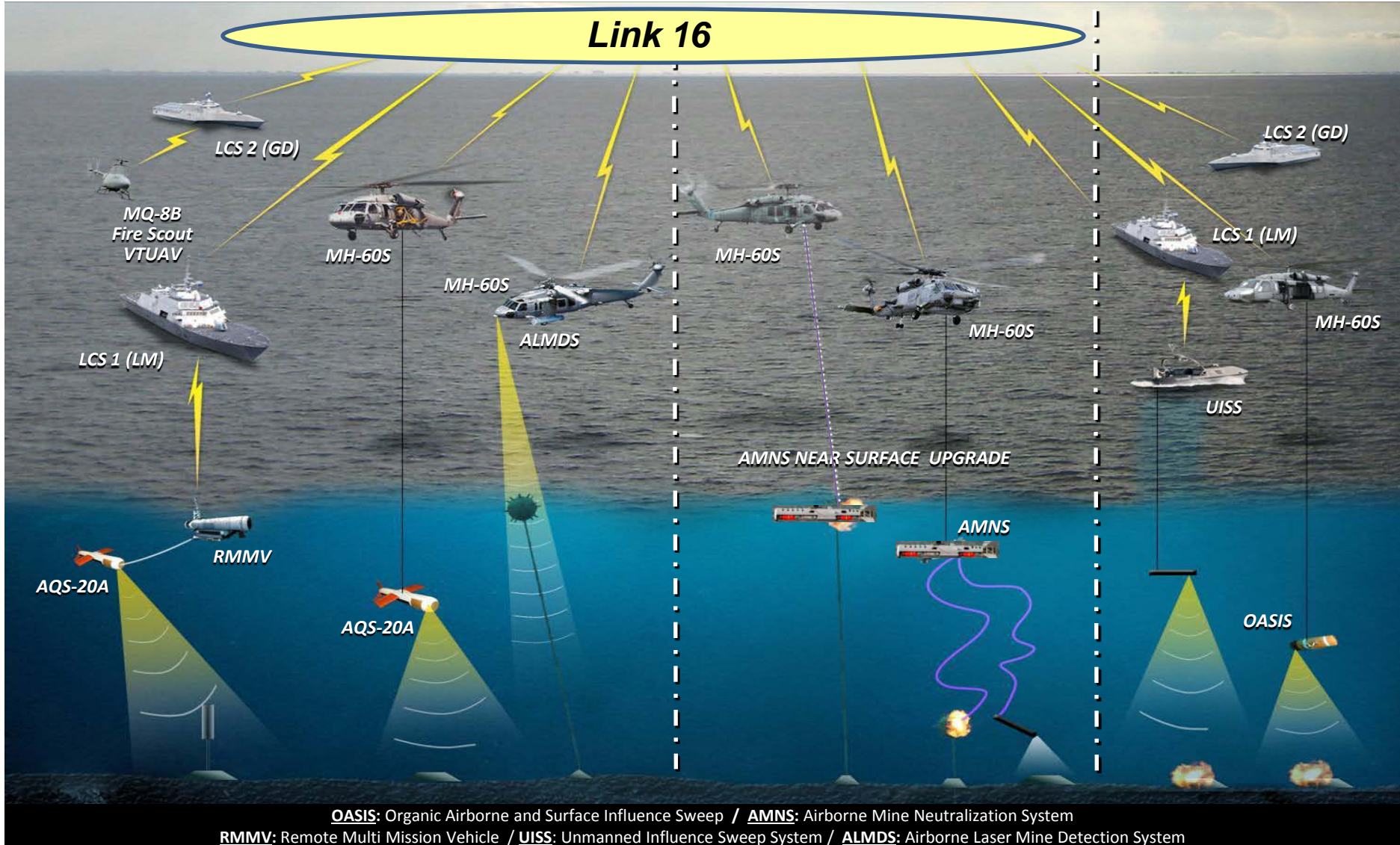
LCS Mine Countermeasures Concept

Detect, Classify & Identify

Engage (Neutralize)

Engage (Sweep)

Link 16



OASIS: Organic Airborne and Surface Influence Sweep / **AMNS:** Airborne Mine Neutralization System

RMMV: Remote Multi Mission Vehicle / **UISS:** Unmanned Influence Sweep System / **ALMDS:** Airborne Laser Mine Detection System



Future Naval Capabilities

Advanced LCS MCM Mission Package

Airborne Mine Neutralization System (AMNS) Improvements

Compact Modular Sensor Suite (CMSS) for Detection & Classification of Surface/Near-Surface Drifting Mines



New Start – FY12

Surface/Near-Surface Drifting Mine Neutralization Capability for AMNS

New Start – FY13

Ultra Light Structures

Unmanned Systems Common Control (SUMMIT)



New Start – FY12/13

Automated Mission Module

Mine Drift Tactical Decision Aid Automated Mission Planning

MCM Sensor Data Fusion

New Start – FY13



Single Sortie Detect-to-Engage (DTE) Payload for USV

UUV Buried Mine Sensor (LFBB) Long Range LFBB Sonar





FY12 FNC: Compact Modular Sensor/ Processing Suite (CMSS)

CMSS

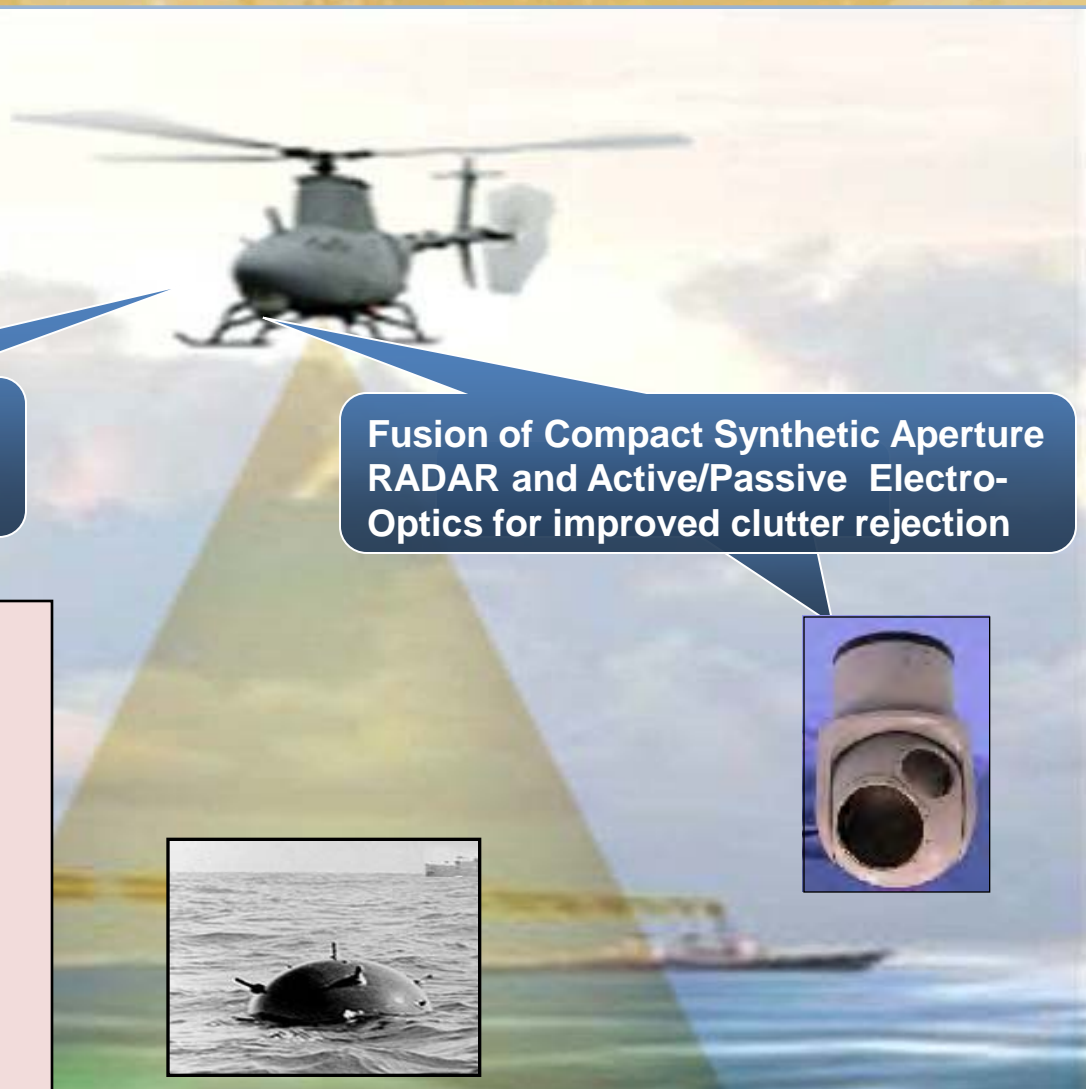
- Small Multi-mode Sensor Package
- Real-time Detection/Classification
- Surface and Near-Surface Mines
- Drifting/Oscillating (Moving) Mines

Real-time processing eliminates requirement for off-board classification

Fusion of Compact Synthetic Aperture RADAR and Active/Passive Electro-Optics for improved clutter rejection

Opportunities for Industry (FY12):

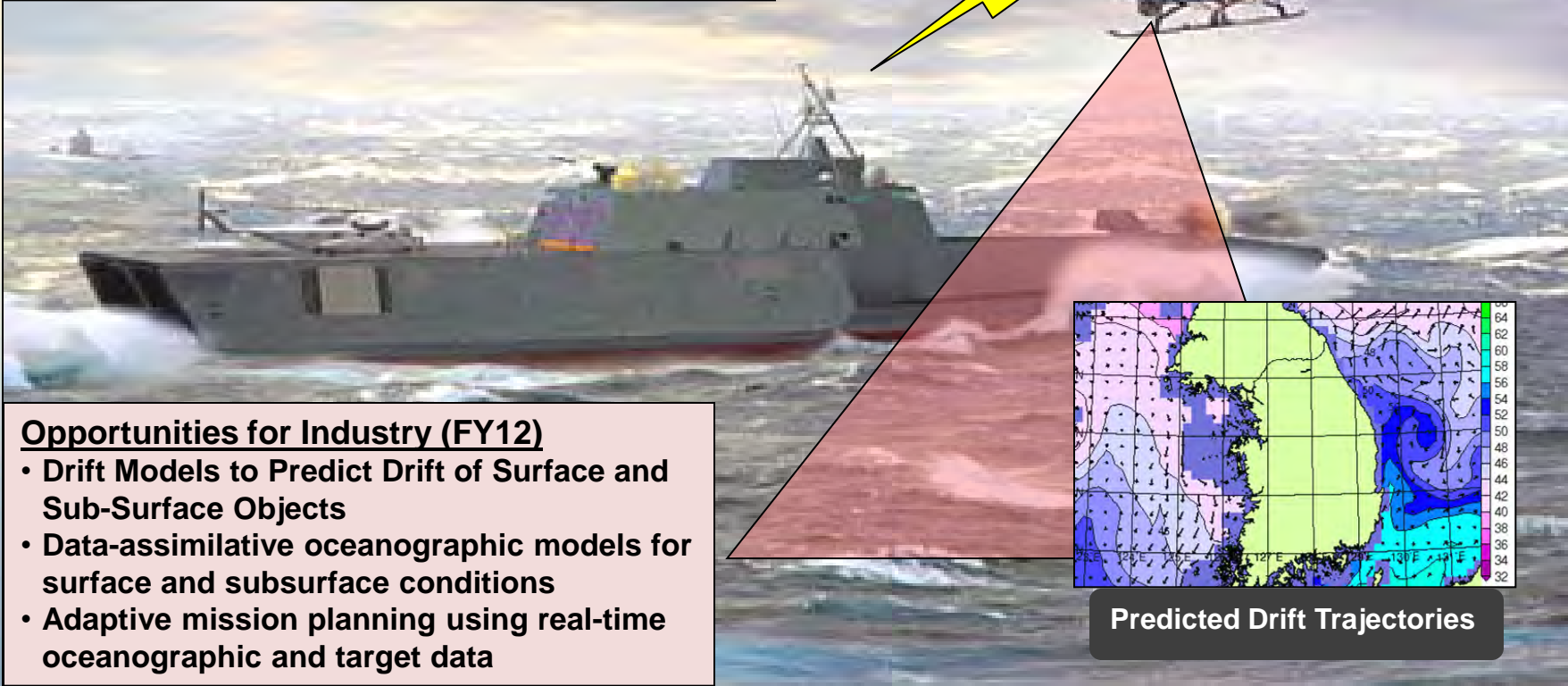
- Sensor System with Multiple Sensing Modalities (Active/Passive Electro-Optic, Synthetic Aperture RADAR)
- Real-Time Onboard Target Classification
- Advanced Target Recognition Algorithms
- Real-time In-Situ Characterization of the Environment (waves, currents)



FY12 FNC: Mine Drift Prediction Tactical Decision Aid (TDA)

The Mine Drift Prediction TDA

- Drift trajectories using real-time data
- Plan optimal deployment of MCM assets
- Generate maneuver plan for surface combatants
- Infer locations of mine deployment



Opportunities for Industry (FY12)

- Drift Models to Predict Drift of Surface and Sub-Surface Objects
- Data-assimilative oceanographic models for surface and subsurface conditions
- Adaptive mission planning using real-time oceanographic and target data

Predicted Drift Trajectories

FY13 FNC: Single Sortie MCM

Detect-to-Engage Payload

Full Detect-to-Engage

- Mine Reconnaissance
- Mine Identification
- Mine Neutralization

Opportunities for Industry (FY13):

- Concepts & solutions for USV-based launch and recovery of UUVs
- Architecture & infrastructure for USV-aircraft & USV-UUV cooperation and supervised autonomy
- Concepts & solutions for automated battle damage assessment of mine neutralization

OTH Communications

Mine Neutralization
Capability & Automated
Battle Damage Assessment

Automated UUV
launch & recovery

USV-UUV communications
and coordination

FY13 FNC: MCM Payload Automation



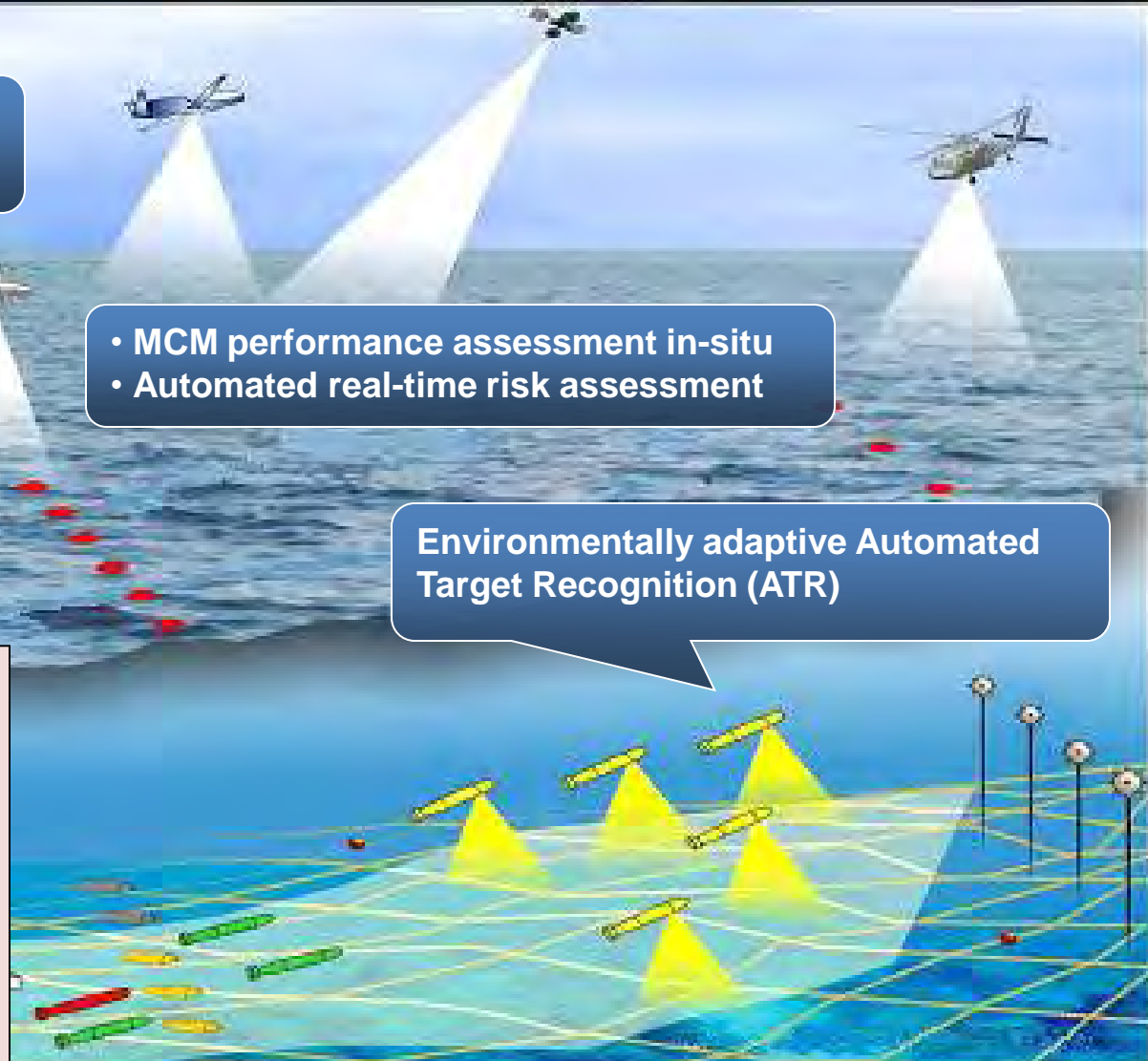
In-stride planning/re-planning based on real-time data

- MCM performance assessment in-situ
- Automated real-time risk assessment

Environmentally adaptive Automated Target Recognition (ATR)

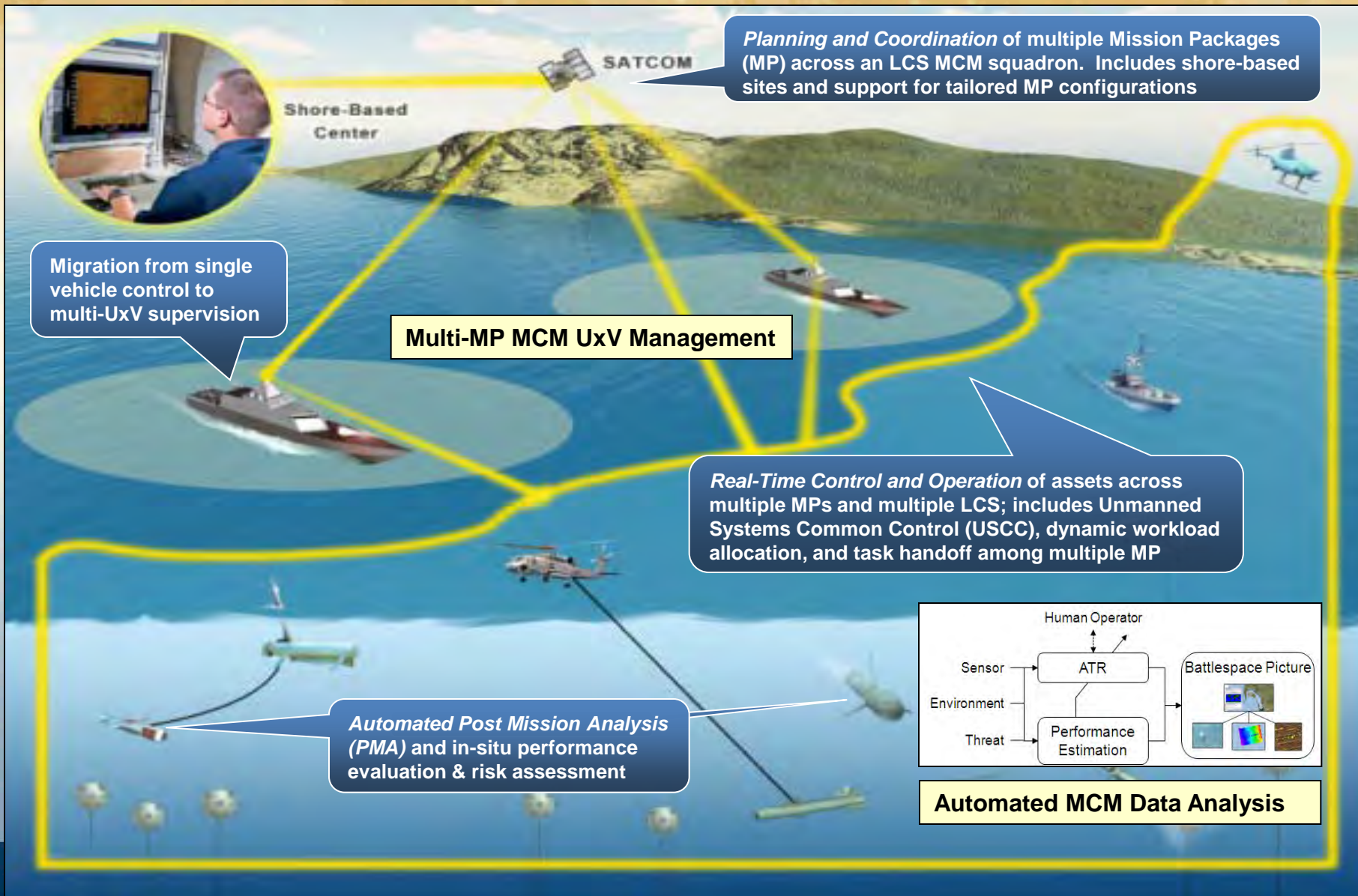
Opportunities for Industry (FY13)

- Algorithms & software development for environmentally adaptive automatic target recognition (ATR)
- Algorithms & software for system performance estimation
- Algorithms & software for MCM risk-based planning and in-stride re-planning



Multi Mission Package MCM Automation

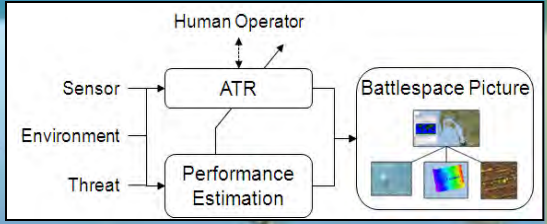
“The MCM MP must support squadron-level operations”



Planning and Coordination of multiple Mission Packages (MP) across an LCS MCM squadron. Includes shore-based sites and support for tailored MP configurations

Migration from single vehicle control to multi-UxV supervision

Real-Time Control and Operation of assets across multiple MPs and multiple LCS; includes Unmanned Systems Common Control (USCC), dynamic workload allocation, and task handoff among multiple MP



Automated MCM Data Analysis

Large Diameter Unmanned Undersea Vehicle

Naval Strategic Priority

Product Description:

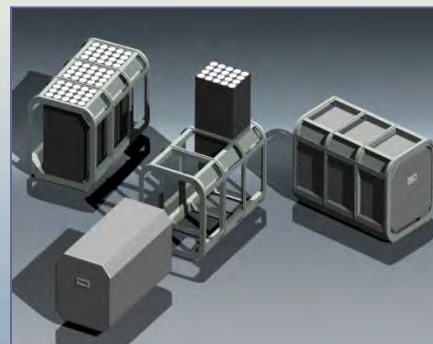
- Reliable Long Endurance UUV capable of 60+ days of operation in the Littorals.
- Program will develop the needed Autonomy, Energy, and Core UUV systems to operate in complex ocean environment near harbors, shore, and high surface traffic locations

Key Program Goals

- Double Current UUV Energy Density
- Autonomous in the Littorals:
- Open Architecture
- Open Ocean/Over the Horizon Operations

Opportunities for Industry:

- Power and Energy technologies
- Autonomy in the Littorals
- Endurance and Reliability technologies



**Open Architecture
Modular Payloads**



**Autonomous
Operation**

Ocean Battlespace Sensing Department

Enabling Revolutionary Naval Expeditionary Warfare Capabilities



Revolutionary Research . . . Relevant Results

***16th Annual Expeditionary Warfare Conference
Panama City, Florida***

26 October 2011

Tom Swean Jr. PhD

Team Leader, MIW Program (ONR 321)

Voice: (703) 696-4025 Fax: (703) 696-3390 sweant@onr.navy.mil

ONR 34: Warfighter Performance

Sustaining the Edge

Serving the Next Generation Warfighter ... Now

Expeditionary Warfare Conference

Matthew J. Swiergosz, PhD

CDR, MSC, USN

26 October 2011



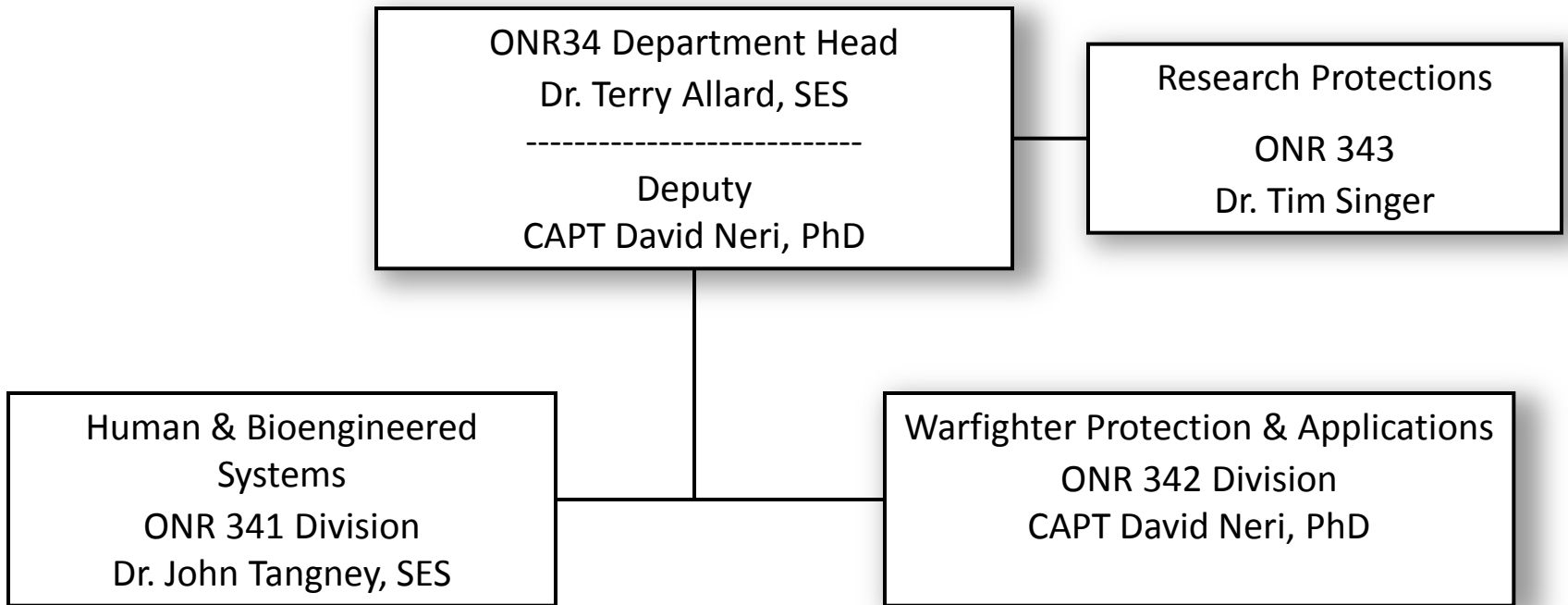
DISTRIBUTION STATEMENT: A
Approved for public release; distribution is unlimited.



OFFICE OF NAVAL RESEARCH



ONR 34 LEADERSHIP



SCIENCE & TECHNOLOGY COMPETENCIES

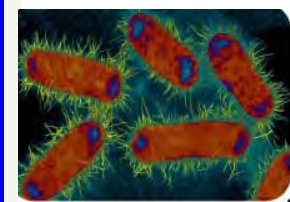
Human Systems Integration

- Manpower Modeling
- Personnel Selection & Assignment
- Training
- User-Centered Design
- C2 Decision Support
- Safety



Bio-Engineered Systems

- Marine Mammal Health
- Bio-based Sensors
- Microbial Fuel Cells
- Bio Robotics
- Human-Autonomy Systems



Sentinel/killer cells

Undersea & Expeditionary Medicine

- Undersea Medicine
- Point of Injury Care
 - Extend "Golden Hour"
 - Treat hemorrhagic shock
- Automated Medical Monitoring /Care / CASEVAC
- Traumatic Brain Injury



HISTORY OF SUCCESS

Pharmaceuticals



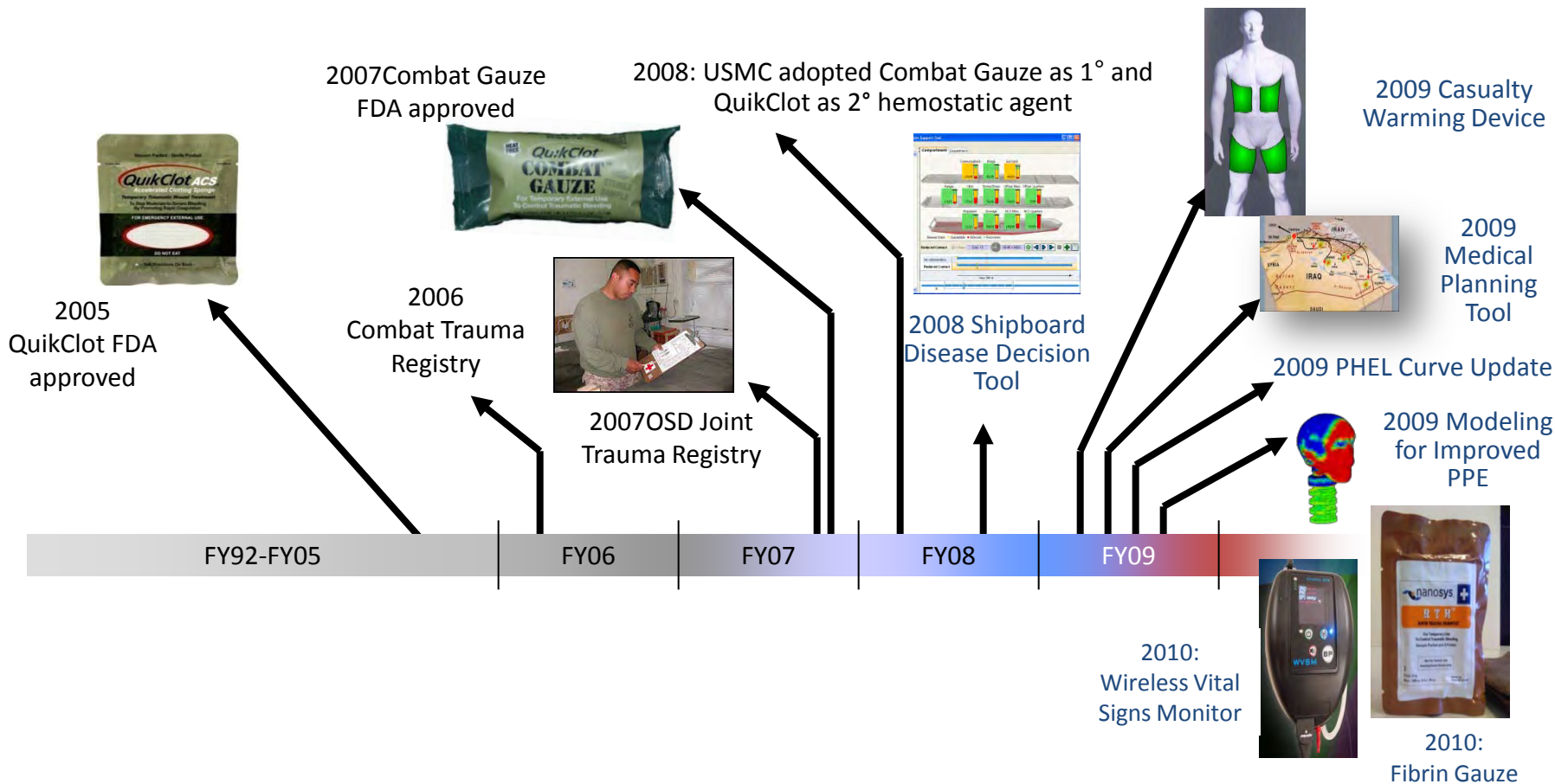
Blood



Devices

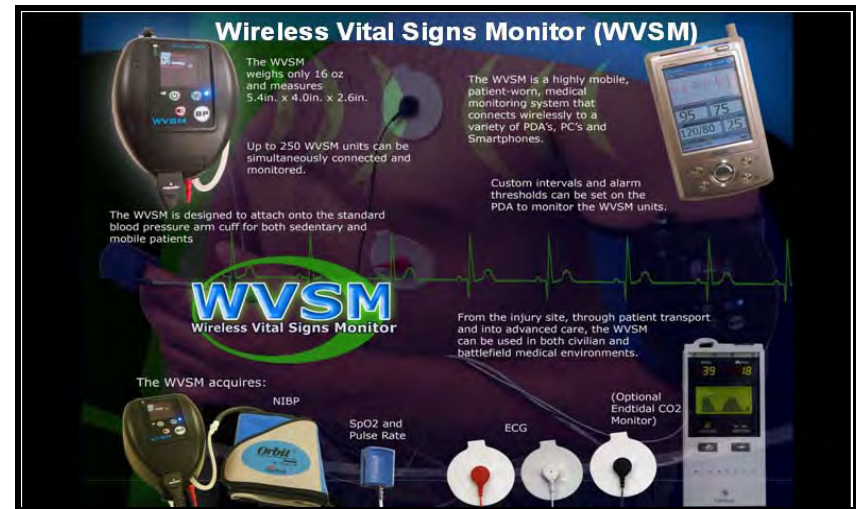


Discoveries



WIRELESS VITAL SIGNS MONITOR

- Small, lightweight, highly-mobile, patient-worn medical monitoring system
- WiFi technology to collect and display a patient's vital signs.
- Enables medical personnel to be in touch with remote or on-site monitoring
- Connects wirelessly to Smart Phones, PDAs and multiple PCs.



- ONR Force Health Protection FNC Product demo in 2007, FDA-approved in 2010
- Integrates **standard medical technologies, e.g., blood oxygenation sensor (SPO₂), non-invasive blood pressure (NIBP) monitor, Heart rate, and electrocardiograph (ECG)**, already on the market – thereby minimizing product acquisition and support costs
- Attaches to the standard blood pressure arm cuff for sedentary & mobile patients
- Development / evaluation by SOCOM (mini-Medic), NECC for Expeditionary Resuscitative Surgical Suite (ERSS), Army & civilian MEDEVAC helicopters

ONR PI, Dr. Peter Rhee, used WVSM to track vital signs of Congresswoman Giffords. Dr. Rhee was key to ONR's development of QuikClot, now in wide use across DOD.

FORCE HEALTH PROTECTION (FHP)

FUTURE NAVAL CAPABILITY (FNC) PROGRAM

FY08

Casualty Prevention



Treatment for Decompression Sickness



Models of Head and Cervical Spine

FY08

Warfighter Restoration



Hearing Loss Prevention and Treatment



Post-Traumatic Stress Mitigation



Repetitive Neurotrauma Mitigation



Wound Repair Wound Healing

Dr. Tim Bentley, FHP FNC Deputy

FY10

Human Injury Treatment Models



FY08

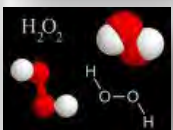
Advanced Forward Care



Closed Loop Fluid Delivery



Closed Loop Ventilation



Oxygen Generation

FY08

Rapid Blood Treatment



Hemostatic Agents FY13



Pharmacologic Resuscitation FY13



Transfusion Safety FY13

FY11

Multi-Functional Blood Substitute

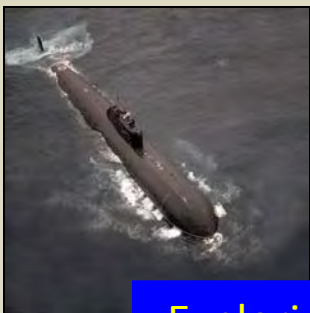


FORCE HEALTH PROTECTION (FHP)

FUTURE NAVAL CAPABILITY (FNC) PROGRAM

FHP-FY12-01: Automated Critical Care System

En Route Care - efficient and lighter with integrated physiological systems



Provides:

- Physiological Monitoring
- Mechanical Ventilation
- Supplemental Oxygen

Therapy

- Analgesia/Anesthesia
- Fluid & Drug Therapy
- Casualty & Fluid Warming
- Patient data storage and transmission

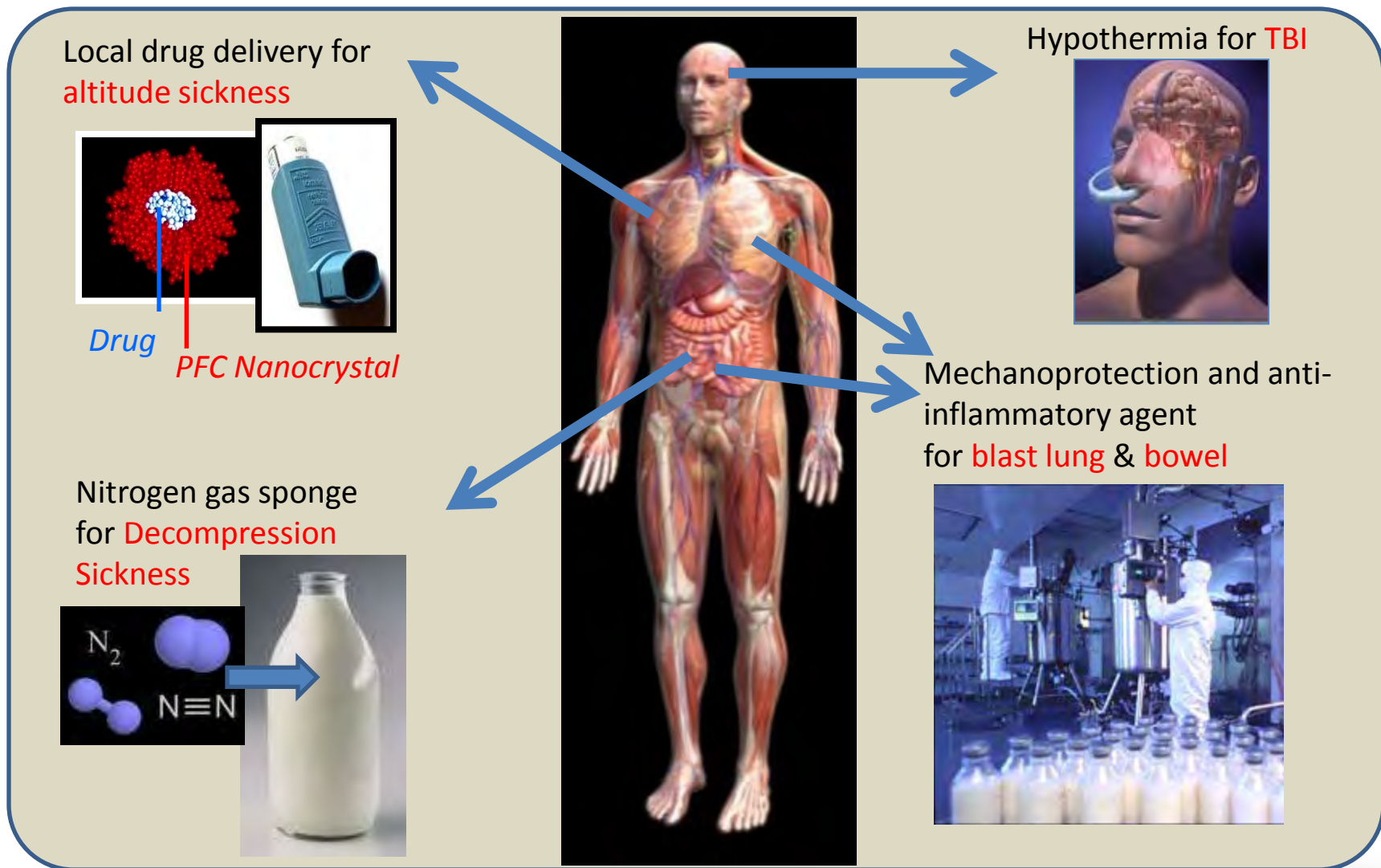
Exploring Joint Acquisition Strategy

Dr. Michael Given EC Manager

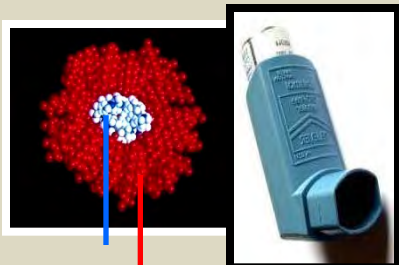
FORCE HEALTH PROTECTION (FHP)

FUTURE NAVAL CAPABILITY (FNC) PROGRAM

FHP-FY12-02: Saving Lives with Emergency Medical Perfluorocarbons in the Field (SEMPer Fi)



Local drug delivery for altitude sickness



Drug
PFC Nanocrystal

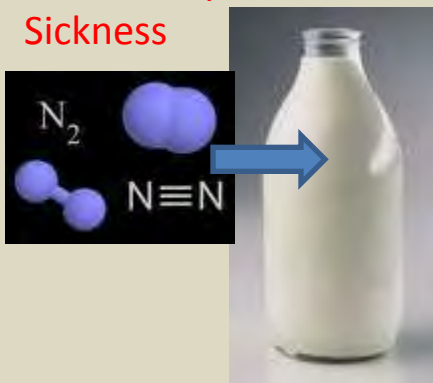
Hypothermia for TBI



Mechanoprotection and anti-inflammatory agent for blast lung & bowel



Nitrogen gas sponge for Decompression Sickness



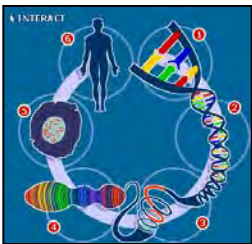
CDR Sheri Parker EC Manager

UNDERSEA MEDICINE PROGRAM

NATIONAL NAVAL RESPONSIBILITY

BASIC

Decompression Illness



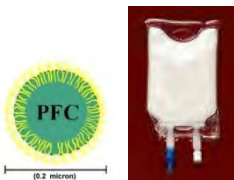
Gas transport through channels
 Allometric Scaling of DCS
 Biochemical Markers of DCS
 Neutrophils in DCS

APPLIED



Bubble Detection
 Basis and Treatment of AGE
 Platelet-Neutrophil Aggregation
 PFC Treatment
 Autonomic Nervous System Effects

ADVANCED



PFC treatment

Oxygen Toxicity



Cellular Mechanisms
 Hyperoxemia-induced Stress in CNS Cells
 CNS-Pulmonary Interaction in OxTox
 Ca²⁺-mediated impairment of CNS
 Neutrophil Adherence



Fatigue & Exercise Intolerance
 Biosensor for Ectrophysiology
 Vigabatrin Treatment

Submarine / Diver Health and Performance



Epidemiology: Medical Events
 Ultrasonic Hearing
 Women in Subs: Reproductive Toxicity



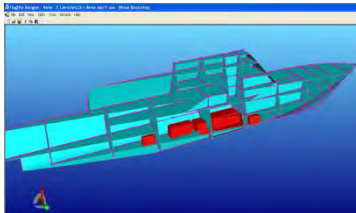
Respiratory Work at Depth
 Inert Gas & Hyperbaric Pressure in the Hippocampus
 Bone Health
 Scalable Hyperbaric Patch Clamp

CDR Matthew Swiergosz Ph.D.

NOISE INDUCED HEARING LOSS PROGRAM

Mr. Kurt Yankaskas & CDR Matthew Swiergosz Ph.D.

Reduce Noise at the Source



Shipboard noise assessment



Jet noise measurement standards



Laboratory scale tests of jet noise reduction

Personal Protective Equipment (PPE)



Shipboard PPE



3D Digitization for "Prescription" Ear Plugs



In-Ear Dosimetry



Underwater comm's & hearing protection

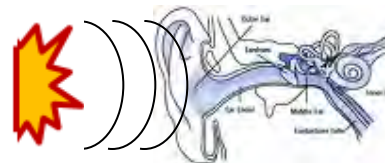
Medical Prevention & Treatment



Cell regeneration



Pharmacologic interventions

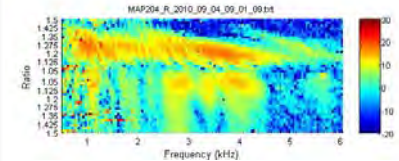


Blast interventions



Pulmonary and nasal drug delivery

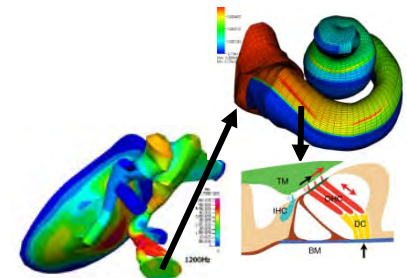
Incidence, Susceptibility & Evaluation



Assessment tools



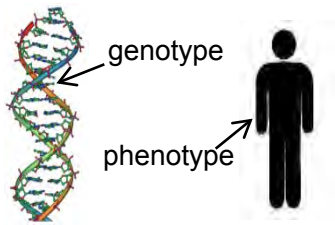
Hearing loss simulator



Modeling Tools

BASIC BIOMEDICAL PROGRAM

Sleep / Fatigue



Phenotypic and Genotypic Markers of **Performance Vulnerability** to Sleep Loss



Work-related Fatigue on Deadly Force Decision Making

Blast



SEMPer Fi Continuation (support of EC) PFC-TBI Funding



Management of acute and sub-acute **traumatic brain injury**: Can **hyperbaric oxygen therapy** improve outcome?

CDR Sheri Parker, Ph.D.

Environment



Exertional **Heat Illness** Biomarkers for Prediction and Return to Duty

In Vivo Animal Model (and Biomarkers) of **Environmental Heat Stress**



Identification of Markers of Endothelial Permeability in **High Altitude**

CAPABLE MANPOWER (CMP)

FUTURE NAVAL CAPABILITY (FNC) PROGRAM

CMP-FY08-01

Game-Based Training



Advanced Technologies for Automated Performance Assessment in Games FY11



Deployed training games Ship and shore

Automated Performance Assess & After-Action Review FY11



Integrated System for Language Education and Training (ISLET) FY11



Tools for Game-based Training and Assessment of Human Performance FY11

CMP-FY08-05

Strategy for Our People



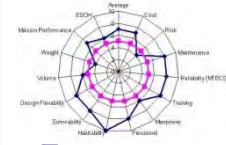
Navy Manpower and Personnel Modeling, Simulation, and Optimization Tools FY12

CMP-FY08-03

Human Systems Integration



Exceptional Expertise for Submarine Command Team Decision Making FY11



HSI Design environment FY12



State of the Art, Multimodal Tools for Increased Situational Awareness in Sonar FY10



Unmanned Vehicle Control & Monitoring HCI for Amphibious Operations FY11

CMP-FY08-06

Training & Assessment for Expeditionary Warfare



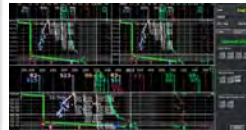
Behavioral Analysis and Synthesis for Intelligent Training FY11



Next Generation Expeditionary Warfare Intelligent Training FY11

CMP-FY10-01

Information Architecture for Improved Decision Making



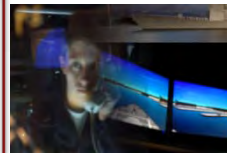
Data Triage FY14



Display Information with Uncertainty FY14

CMP-FY10-02

Adaptive Training to Enhance Individual and Team Learning and Performance



For Combat Information Center Teams FY14

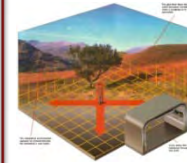


For Submarine Navigation & Piloting Teams FY14

Kip Krebs, Ph.D.

CMP-FY11-01

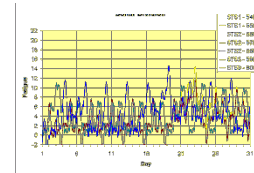
Naval Next-Generation Immersive Technology



Augmented Immersive Team Trng: FY15
Percept Trng Systems & Tools: FY15

CMP-FY11-02

Performance Shaping Functions for Environmental Stressors



Performance Shaping Functions FY15

CMP-FY12-01

Live, Virtual, and Constructive Trng Fidelity



Tactics & Speech Capable Semi-Auto Forces: FY16



Cognitive Fidelity Synthetic Environment FY16



Virtual/Constructive Reps on Live Avionics Displays: FY16



ONR WARFIGHTER PERFORMANCE S&T DEPARTMENT

ONR34 : WARFIGHTER PERFORMANCE Science & Technology Department Dr. Terry Allard, Department Head / CAPT David Neri PhD, Deputy			
341: HUMAN & BIO-ENGINEERED SYSTEMS		342: WARFIGHTER PROTECTION & APPLICATIONS	
Dr. John Tangney, Division Director		CAPT David Neri PhD, Division Director	
Name	Program	Name	Program
Dr. Linda Chrisey	Naval Biosciences	Dr. Tim Bentley	Force Health Protection FNC Deputy
CDR Joseph Cohn PhD	Division Deputy	Dr. Ami Bolton	Human Systems Design
Dr. Rebecca Goolsby	Social Networks/ Anthropology	Dr. Mike Given	Casualty Care & Mgmt
Dr. Harold Hawkins	Training S&T, Modeling & Simulation	Dr. Laura Kienker	Naval Biosciences
Dr. Tom McKenna	Neuroscience/Biorobotics/ Biometrics	Dr. Kip Krebs	Capable Manpower FNC Deputy
Dr. Jeffrey Morrison	C2 Decision Support	CDR Sheri Parker PhD	Division Deputy, Basic Biomedical
Dr. Ray Perez	Training & Education S&T	CDR Matt Swiergosz PhD	Undersea Medicine Program
		Mr. Kurt Yankaskas - NAVSEA	Noise Induced Hearing Loss (NIHL)



BACK-UP



Expeditionary Medicine

Hemorrhage and Resuscitation

FHP-FY08-13 [Rapid Blood Treatment](#)



Spray Dried Plasma
Fibrin Gauze

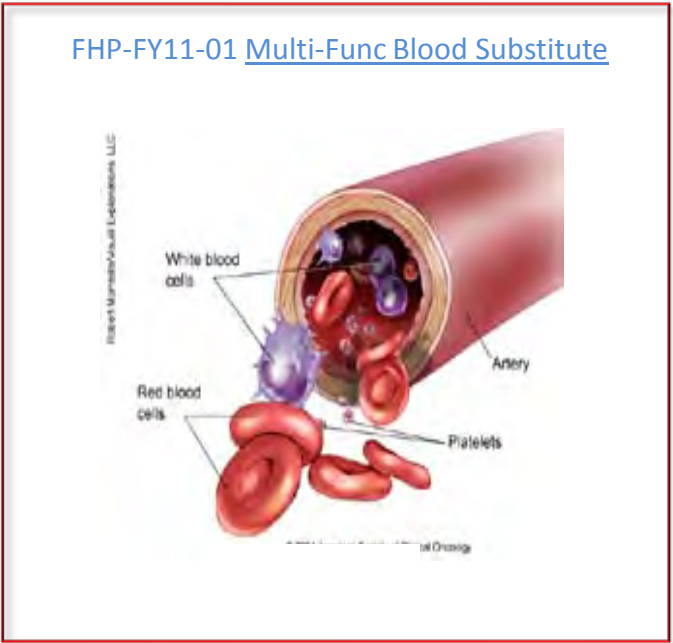
Pharmacologic
Resuscitation



Transfusion
Safety

**Hemorrhage is the #1 cause
of preventable death on the battlefield**

FHP-FY11-01 [Multi-Func Blood Substitute](#)

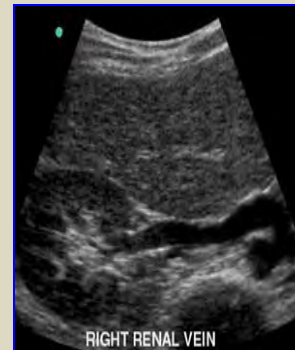


Dr. Michael Given EC Manager

Proposed FHP-FY13-01: Sound Diagnostics

Enhancements for Hand-Held Ultrasound

Non-expeditionary



Expeditionary



4D-Imaging capability
(HW/SW)

Computerized
training modules

SPIO-platelets for
detection of
internal bleeding

Pulmonary and
transcranial imaging

Dr. Michael Given EC Manager



ONR Strategy for Force Health Protection

A Continuum of Care

Pre-Deployment Care & Prevention



- Hearing Loss Prevention & Treatment
- PTSD Prevention & Mitigation
- Modeling & Simulation for Improved PPE
- Submariner Health

Advanced Forward (Point-of-Injury) Care



- Hemostatic Agents
- Pharmacologic Resuscitation
- Rapid Blood Typing & Pathogen Detection
- TBI detection

En Route and Automated Care



- Closed Loop Fluid & Ventilation System
- Oxygen Generation, Patient Warming

Post-Deployment Care, Treatment, and Restoration



- Wound Healing
- Wound repair
- AFIRM:
Armed Forces Institute of Regenerative Medicine

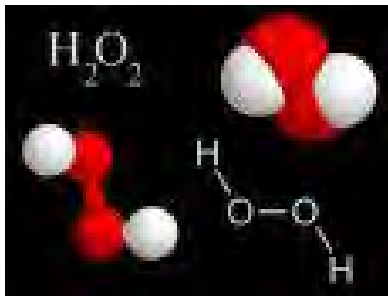
FHP-FY08-02 Advanced Forward Care



Closed Loop Fluid Delivery



Closed Loop Ventilation



Oxygen Generation Without Power

Better Care / Force Multiplier for Seabasing and Distributed Operations

ACCS



Dr. Michael Given EC Manager



Casualty Warming Device (CWD)

Description: Hypothermia prevention product

Naval Need: Solution that is...

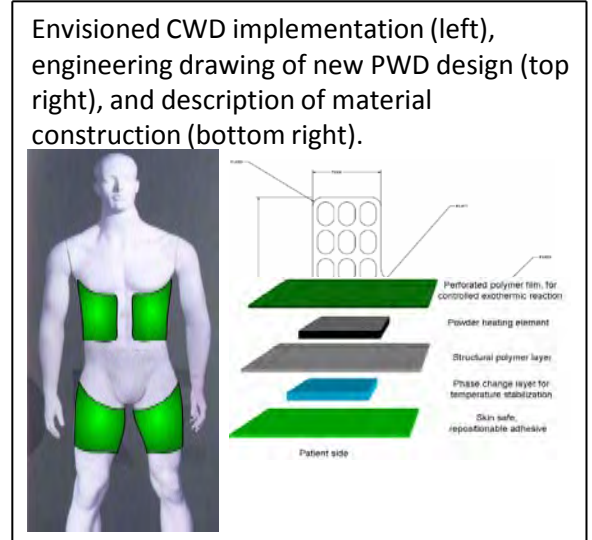
- Lightweight & disposable
- Compact & shelf-stable
- Low-cost
- Has no power generation requirement

Discovery and Invention Efforts Leveraged:

In clinical studies, Infoscitex demonstrated CWD maintained skin interface temperature at 40°C (104°F) for 8 hr, greatly surpassing stability of other devices

Impact: Hypothermia prevention that...

- Requires no external power
- Achieves self-regulation achieved by unique dual layer technology
- Enables safe, unattended operation
- Provides stable temperature up to 8 hr



FY10: Transitioned to MCSC for evaluation with other casualty warming technologies. NECC will accept MCSC recommendation.



Synthetic Fibrin Dressing

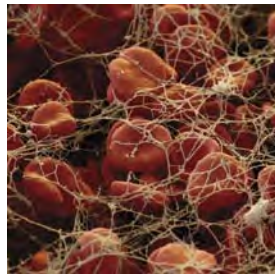
Description: Nanofiber bandage with desired properties of blood absorbability and biodegradability over period of days

Naval Need:

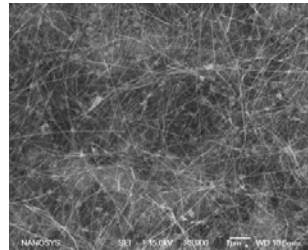
- Reducing hemorrhage -- leading cause of death on battlefield
- A solution with point-of-injury use, adequate resorption (so can be left in wound), and capability of internal use

Impact:

- Improved hemorrhage control
- Will reduce killed-in-action rate
- Will reduce requirement for blood / resuscitation fluids on the battlefield



Fibrin mesh trapping rbc's and platelets



Synthetic "Fibrin" mesh



"Rapid Trauma Hemostat" Dressing

*FY10: External use submitted to FDA for approval;
internal use submission to follow*

Description: Closed-Loop-Control (CLC) system for fluid resuscitation

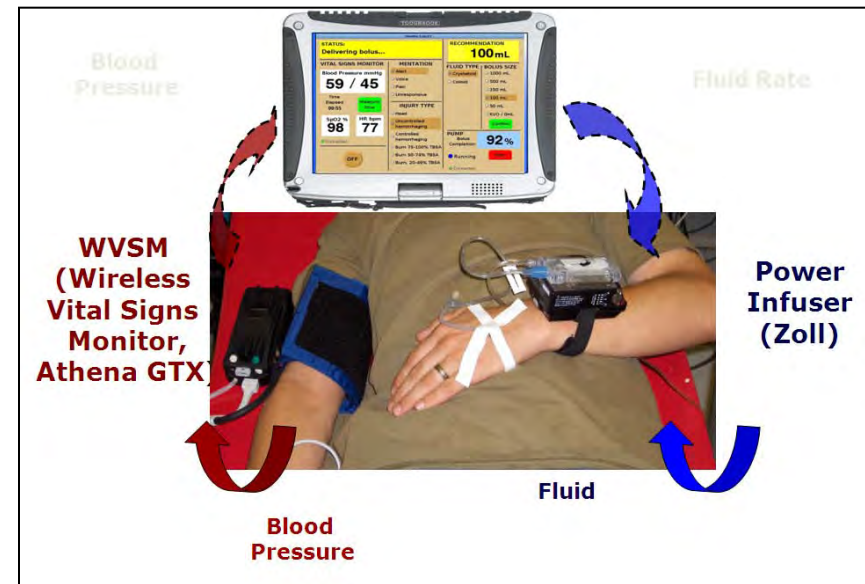
Naval Need:

- Continuous patient monitoring
- Less outside intervention
- Improved patient care for better outcomes

Impact:

- 24/7 patient monitoring
- Reduced risk of over/under fluid resuscitation and subsequent med issues
- Decision-Assist provides recommendations for acceptance or rejection
- Fully autonomous-care-capable
- Reduced logistics: 80% reduction in fluid required to maintain target blood pressure

Current prototype of the closed-loop control system for fluid resuscitation.



Dr. Michael Given

FY10: Decision-Assist component submitted to FDA for approval



Died-of-Wounds Projection

Description: Dynamic Military Treatment Facility (MTF) planning tool and decision aid for medical combat developers

Naval Need:

- In-theater decision aid to redeploy medical assets to meet changing operational conditions
- Objectively model the effects of treatment delays on mortality



Snapshot of Combat Operations and MTF Network in the Iraqi Theater

Warfighting Payoff:

- Quickly examine reasonable Courses of Action (CoA) for an MTF network in dynamic situations
- Supports USMC “Distributed Operations” concept
- Medical planner can select best CoA based on associated field operational and medical system constraints

*A Medical Planning Tool to Optimize Deployment of Limited Medical Assets
FY10: Transitioned to Marine Corps Combat Dev Command; Used in OIF and OEF Theater*

Dr. Michael Given

Description: High fidelity computational model of human head and ears to simulate blast/noise energy transfer from air to inner ear. Model is being validated in Marine Corps Breachers study.

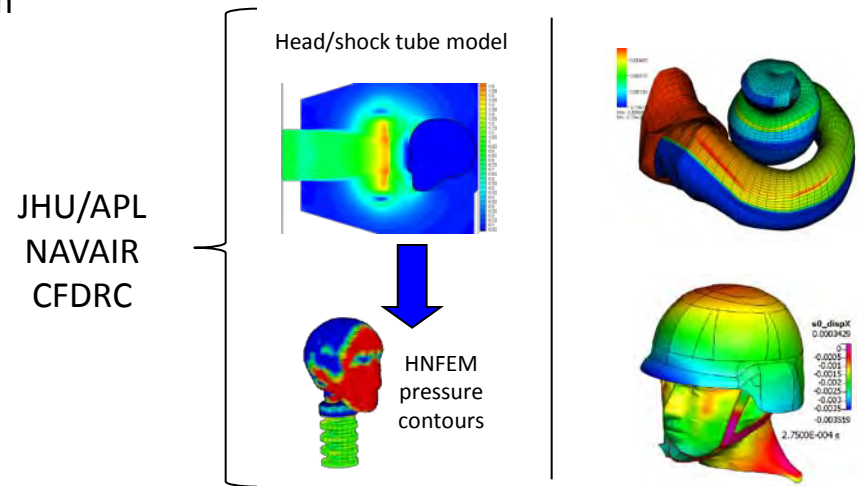
Naval Need:

- Modeling and simulation of blast injuries
- Protection for head, neck and spine
- Accurate enhancement of specs for Personal Protective Equipment (PPE)
- Fewer injuries associated with blast effects on the head and neck.

Warfighting Payoff:

Accurate pressure profiles to enhance protection against:

- IEDs (ground)
- rapid ascent from depth (diving)
- flight ops acceleration (altitude)
- ejection G stress (flight ops)
- Noise (everywhere)



- Project Funded by ONR Force Health Protection, Undersea Medicine & Noise Induced Hearing Loss
- Represents collaboration between government labs, academia and industry

Addresses occupational head, neck and spine injuries from blast, noise, pressure and acceleration forces

CDR Sheri Parker PhD

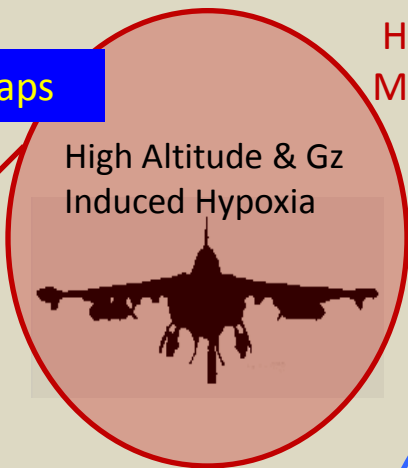
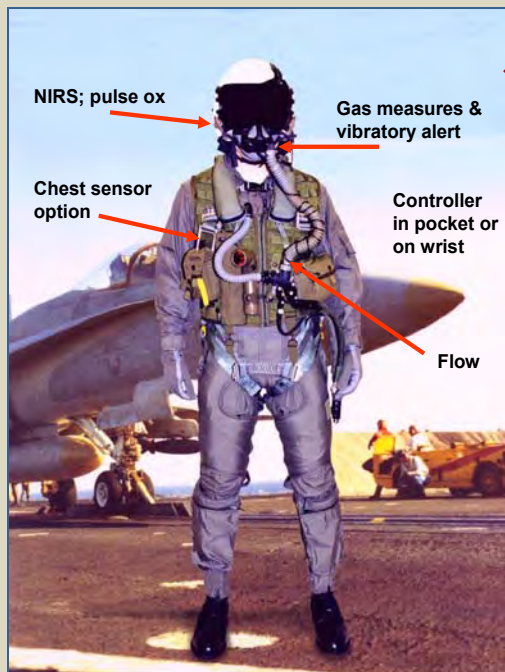


Force Health Protection Future Naval Capability

Expeditionary Medicine,
Undersea Medicine

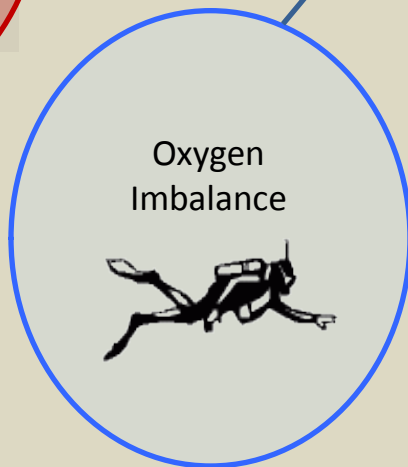
Approved FHP-FY13-03: Extreme Operations

Reduce Class A Aviation Mishaps



High Altitude & Gz
Induced Hypoxia

Hypoxia Alert and
Monitoring System



Oxygen
Imbalance

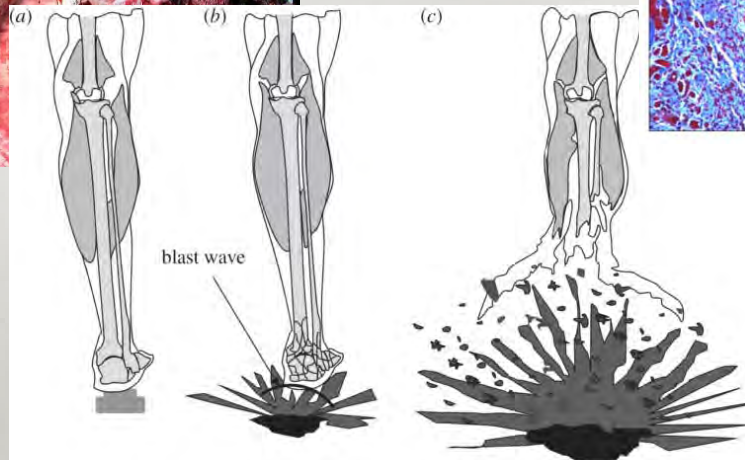
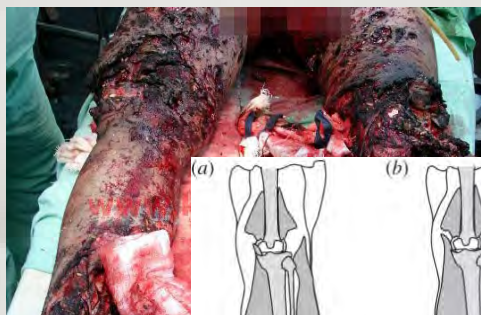


DCS & OxTox:
New indications for already
FDA-approved treatments

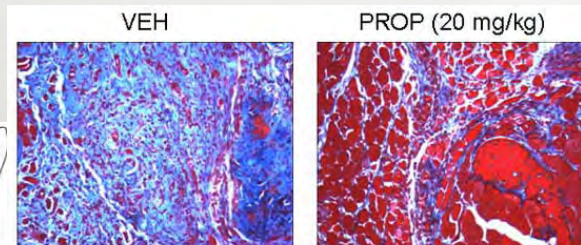
Expand Diver Range / Improve DISSUB rescue

CDR Sheri Park EC Manager

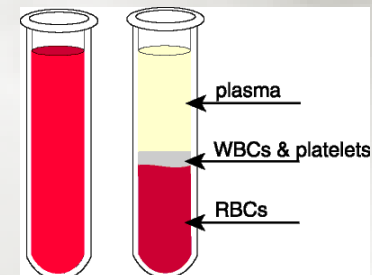
Dismounted Complex Battle Injury a Marine Corps Priority



Tissue Regeneration

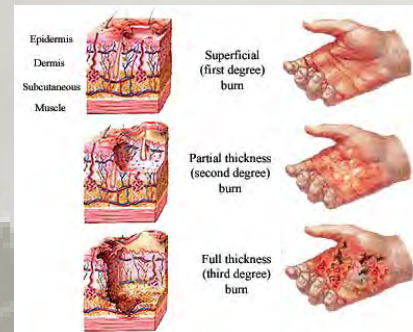


Resuscitation



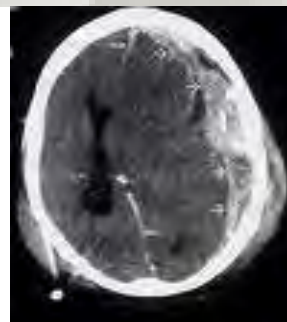
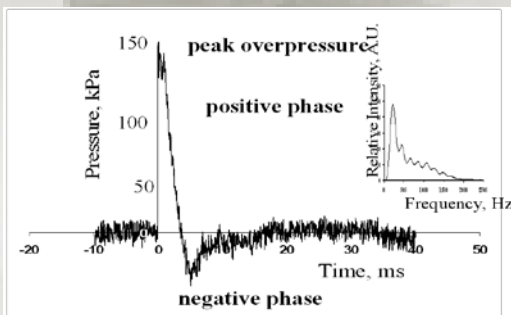
ACCSIL

Tissue Preservation & Limb Sparing

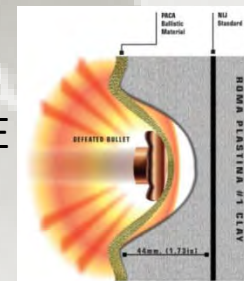


Neurotrauma

Blast Sensing and TBI Detection



I PREDICT Computational Tool for PPE Improvement





Navy Medical Research

Coordinated strategy

CNO Special Interest

Noise-Induced Hearing Loss

- Comprehensive S&T program approved by ASN
- ONR's cross-component leadership
- Linkage to VA, Army, Defense Health Program
- Coordination with BUMED Audiology

Women in Submarine Force

- RDT&E program includes S&T, Advanced Development, O&M,N funding
- BUMED programmatic leadership (Prusaczyk)
- Builds on ONR Health Surveillance Undersea Medicine leadership

ASD (Health Affairs) Defense Health Program

- Cross-component transition strategy
- Navy in Joint Program Committees
- Cross-component reviews (ASBREM)
- Coordinated AFIRM funding strategy

CMC Special Interest

Combat Casualty Care

- Point of Injury Care
- Casualty Evacuation Technologies
- TBI / PTSD
- AFIRM
- Warfighter Resilience
- Dismounted Complex Battle Injury*

* New working group by direction of ACMC.
Report by ~Thanksgiving 2011

Unified DoN RDTE investment plan

- Strong ONR / BUMED cooperation with Navy Advanced Development program (CAPT Montcalm-Smith / Dr. Prusaczyk)

NASA Human Health & Performance Ctr

- Coordination, Collaboration, Leverage
- Industry, Academia, Gov't



National Defense Industrial Association

*16th Annual Expeditionary
Warfare Conference*

24 -27 October 2011

Brigadier General Mark R. Wise, USMC
Commanding General Marine Corps Warfighting Lab
Vice Chief of Naval Research





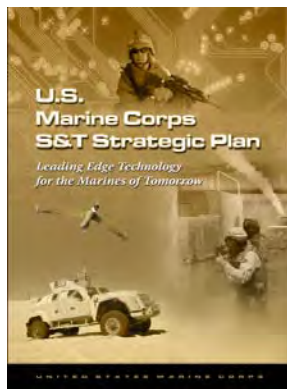
Marine Corps Warfighting Laboratory (MCWL)



VCNR
AVCNR

Coordinating
Authority
for IEDD

Dir CIED Ops



EA For S&T

Tech Dir

CG
MCWL*

Chief of Staff



A Balance Between "Thoughts and Things"

MCWL Mission

Conduct concept based experimentation and wargaming to develop and evaluate tactics, techniques, procedures and technologies in order to support the warfighter by enhancing current and future warfighting capabilities, and serves as executive agent for Counter IED, Science and Technology and Joint Concept Development and Experimentation.





Where are we?



- **Today's Fight**
 - **Armored Medium Tactical Vehicle Replacement (7-ton truck)**
 - **MRAPs**
 - **Forward Operating Bases (FOBs)**
- **Heavy** → Required to meet today's challenges, in today's theater





Where do we need to be?

- **We will respond to today's crisis, with today's force ...TODAY!**



- **The Lab's job is to focus on tomorrow so we can effectively apply that mindset to tomorrow's threat, in a world "where Microsoft coexists with machetes, and stealth is met by suicide bombers"---SecDef Gates**



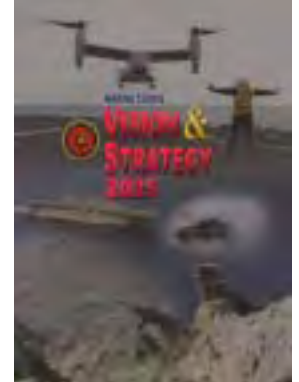
Where Are We Going?

Experimentation + (S&T) for the Future Middle Weight Force



2010
2010
2010

- Provide the best trained and equipped Marine units to Afghanistan
- Rebalance and posture the Corps for the future and aggressively experiment with and implement new capabilities and organizations
- Better educate and train Marines to succeed in distributed operations and increasingly complex environments
- Keep faith with our Marines, our Sailors and our families

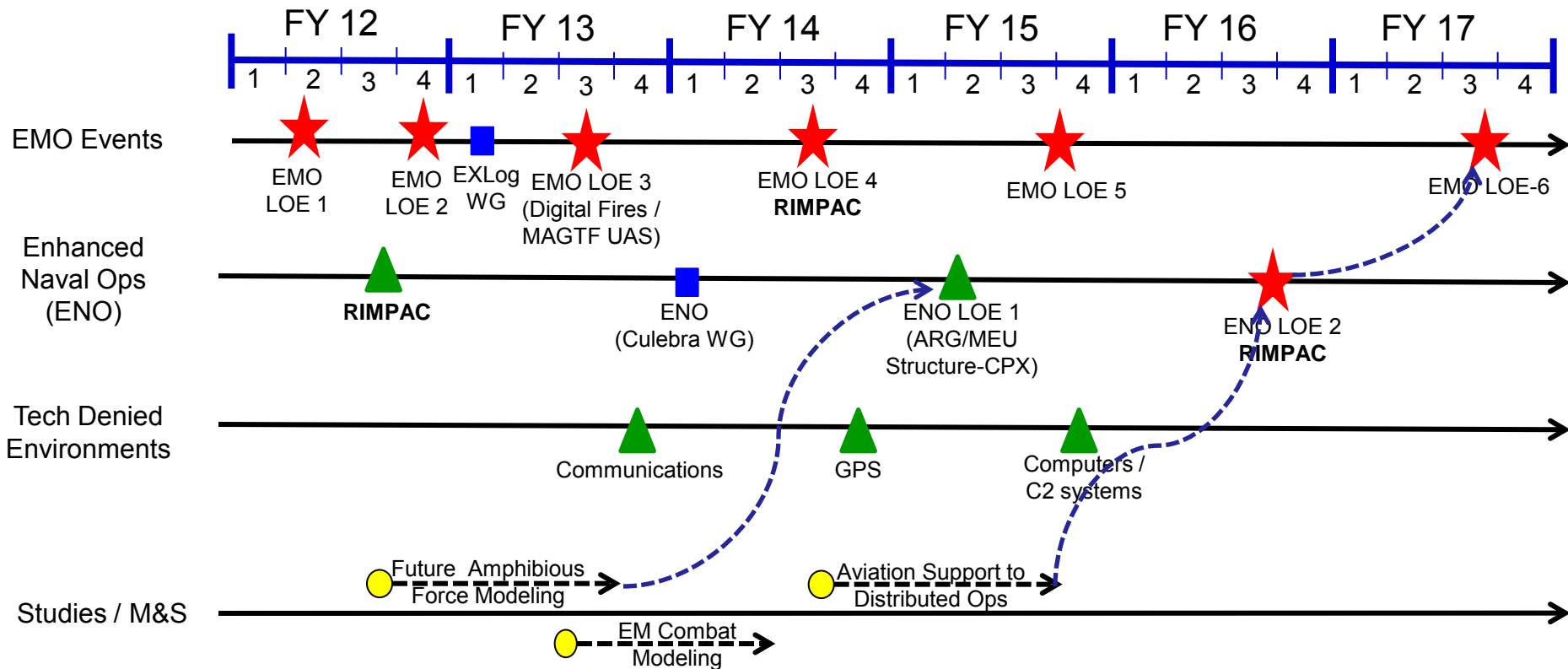


- *“A **middleweight force**, -- light enough to get there quickly, but heavy enough to carry the day upon arrival, and capable of operating independent of local infrastructure.”*
- *“We will rebalance our Corps, posture it for the future and **aggressively experiment** with and **implement new capabilities** and organizations.”*
- *“We will better educate and train our Marines to **succeed in distributed operations** and increasingly complex environments.”*
- *“A Marine Corps that is a multi-capable, combined arms force, comfortable operating at **the high and low ends of the threat spectrum**, or in the shaded areas where they overlap.”*
- *“Leverage the significant advantages that **amphibious forces** provide a maritime power”*





Experiment Campaign Plan



❖ Energy Efficiency & Logistics Demand Reduction (LDR) initiatives will be examined in all LOEs.

■ Wargame

❖ Small-scale Technology-Based LOEs can be facilitated (as required) to ensure Tech inserts are proven in an operational setting prior to insertion into LOEs

▲ Named LOE – Small scale / CPX

★ Numbered LOE – Larger scale





EMO LOE 1 Overview



Who: 2nd MEB and 2nd Fleet ICW Exercise Bold Alligator 2012.

What: Live force experiment with 24th MEU tied to the MEU CERTEX

When: 28 Jan 2012 – 12 Feb 2012

Where : Fort Pickett Virginia with C2 sea-based from IWO ARG.

Why: Test C2 and sustainment enhancements, and examine sea-based operating parameters.



February 2012

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
D - Day ⁵ X - 2	X - 1	Insertion ⁷ X - Day	X + 1	X + 2	X + 3	Live Fire ¹¹ X + 4
EMO LOE 1						

Experiment Objectives

1. Examine MAGTF ability to command and control at extended range.
2. Examine MAGTF command and control organizations' (LFOC/SACC/TACC/TACLOG) ability to do their job now – *and in the future*
3. Examine MAGTF/SOF integration
4. Examine MAGTF ability to sustain ground forces conducting kinetic operations at extended ranges. *Incl T-AKE participation.*
5. Examine fire support issues related to extended range, sea-based operations, digital interoperability.
6. Assess experimental C4ISR enablers.
7. Employ/assess energy efficiencies for a dismounted infantry force.



Logistics Demand Reduction



SLMCO 5.0 Small Unit Water Purifier
 Production: 1,000 Gallons / Day
 Weight: 60 lbs
 Set up Time: 4 min / 1 Marine
 Power: NATO Slave 24VDC, (300 watt)

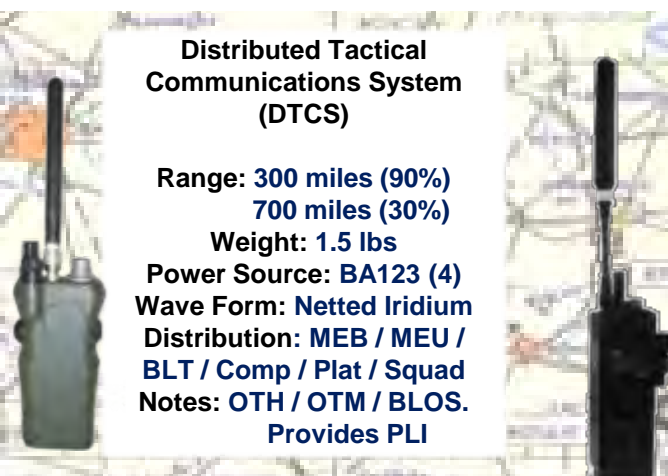


GUSS
 (Optionally
 Autonomous ITV)



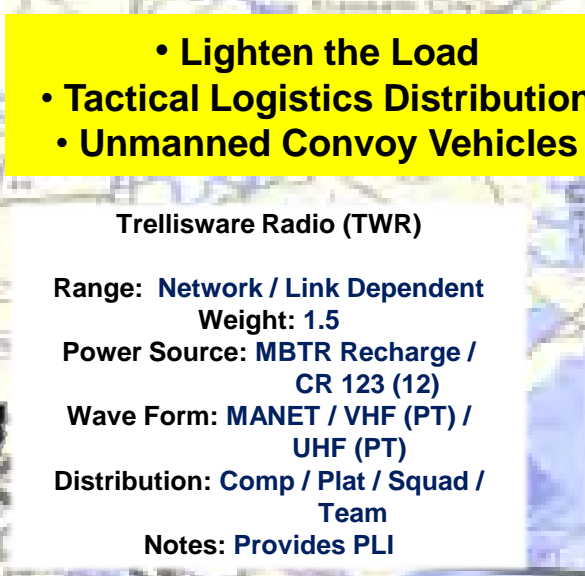
SPACES
 Battery Charger

- Lighten the Load
- Tactical Logistics Distribution
- Unmanned Convoy Vehicles



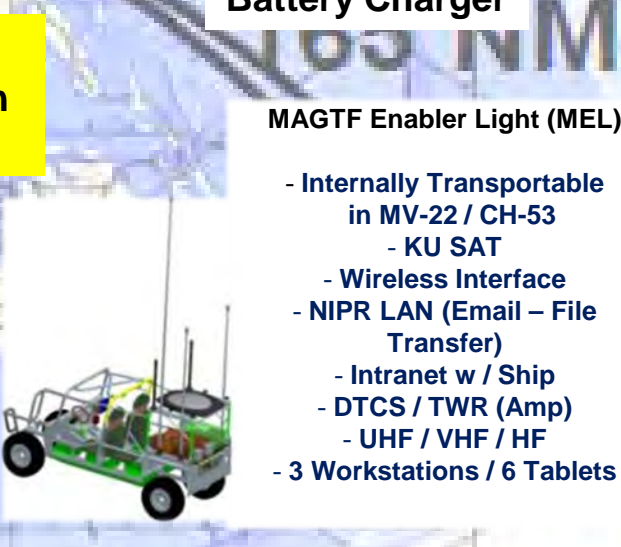
Distributed Tactical Communications System (DTCS)

Range: 300 miles (90%)
 700 miles (30%)
 Weight: 1.5 lbs
 Power Source: BA123 (4)
 Wave Form: Netted Iridium
 Distribution: MEB / MEU / BLT / Comp / Plat / Squad
 Notes: OTH / OTM / BLOS.
 Provides PLI



Trellisware Radio (TWR)

Range: Network / Link Dependent
 Weight: 1.5
 Power Source: MBTR Recharge / CR 123 (12)
 Wave Form: MANET / VHF (PT) / UHF (PT)
 Distribution: Comp / Plat / Squad / Team
 Notes: Provides PLI



MAGTF Enabler Light (MEL)

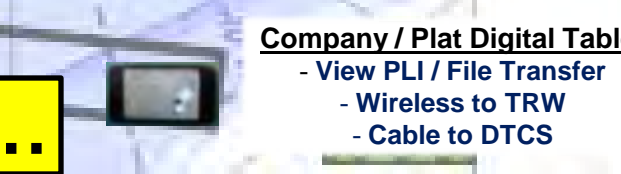
- Internally Transportable in MV-22 / CH-53
- KU SAT
- Wireless Interface
- NIPR LAN (Email – File Transfer)
- Intranet w / Ship
- DTCS / TWR (Amp)
- UHF / VHF / HF
- 3 Workstations / 6 Tablets



Squad Digital Device (Smart Phone Caps)

- View PLI / File Transfer
- Wireless to TRW
- Cable to DTCS

Demand signals...



Company / Plat Digital Tablet

- View PLI / File Transfer
- Wireless to TRW
- Cable to DTCS



Group 1 UAS Aerial Relay

- **DARPA Enhanced Endurance UAS**
 - **Propane Fuel Cell**
 - ~6 hours
- Lockheed Martin Stalker (or AV Puma)
 - EO/ISR
 - HD
- *Focus on Tactical Relay*



Scan Eagle in LOEs in FY12; Stalker in FY 12-15?



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Unmanned Systems Enabling Battlefield Functions



**ONR Gyrocopter
(MMIST)**



**Cargo UGV
(Optionally
Autonomous MTRV)**



DARPA LS3



**TATRC "Black Knight"
(Advanced Tactics, Inc.)**



DARPA Shrike



DARPA Switchblade



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The IED Threat Persistent, Extensive, & Worldwide

From Jul 2009 to Jun 2011...

Map Satellite Hybrid

*Worldwide Monthly
IED Events Excluding IZ/AF
Jul 2009 – Jun 2011
186 Deaths/Month
592 Wounded/Month
100 Attacks/Month*



...13,124 deaths and 43,733 wounded attributed to 7,763 IED attacks worldwide.

Source: National Counter Terrorism Center Worldwide
Incidents Tracking System
<https://wits.nctc.gov/FederalDiscoverWITS>

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What is the next technological “tipping point”?



- **Tactical Energy / Water Solutions**

- **Autonomous Capabilities**

- **Distributed / Deep Operations**
 - Networking on the move
 - Networked long range communications

- **Robotics**

- **Advanced technology to augment human information processing**

- **Amphibious Operations**
 - Surface to Objective Maneuver
 - Rapid build up of combat power
 - Assaults of yesterday are unlikely



Iwo Jima Landing



Higgins Boat Transformational



Where can industry help



- **Versatile capability (Middleweight Force)**
 - Multifunctional to max extent possible
 - Can evolve with the threat—open architecture mindset
 - Less is better
- **Lighter / More Agile (Lighten the load)**
 - Energy innovation → Smaller, longer lasting, more capable
 - Water → Man-portable, individual systems
 - C2 → Fewer systems, more versatile
 - Fits naval shipping
 - Reliance on satellites → jamming threat
 - Individual Marine
 - Survivability → Resistant to IED Threat
 - Light enough to fight



What does the Marine Corps need?



"Andrew Higgins ... is the man who won the war for us. ... If Higgins had not designed and built those LCVs, we never could have landed over an open beach. The whole strategy of the war would have been different."

Gen Dwight Eisenhower



Questions