U.S. Navy Mine Countermeasures

National Defense Industrial Association
12th Expeditionary Warfare Conference

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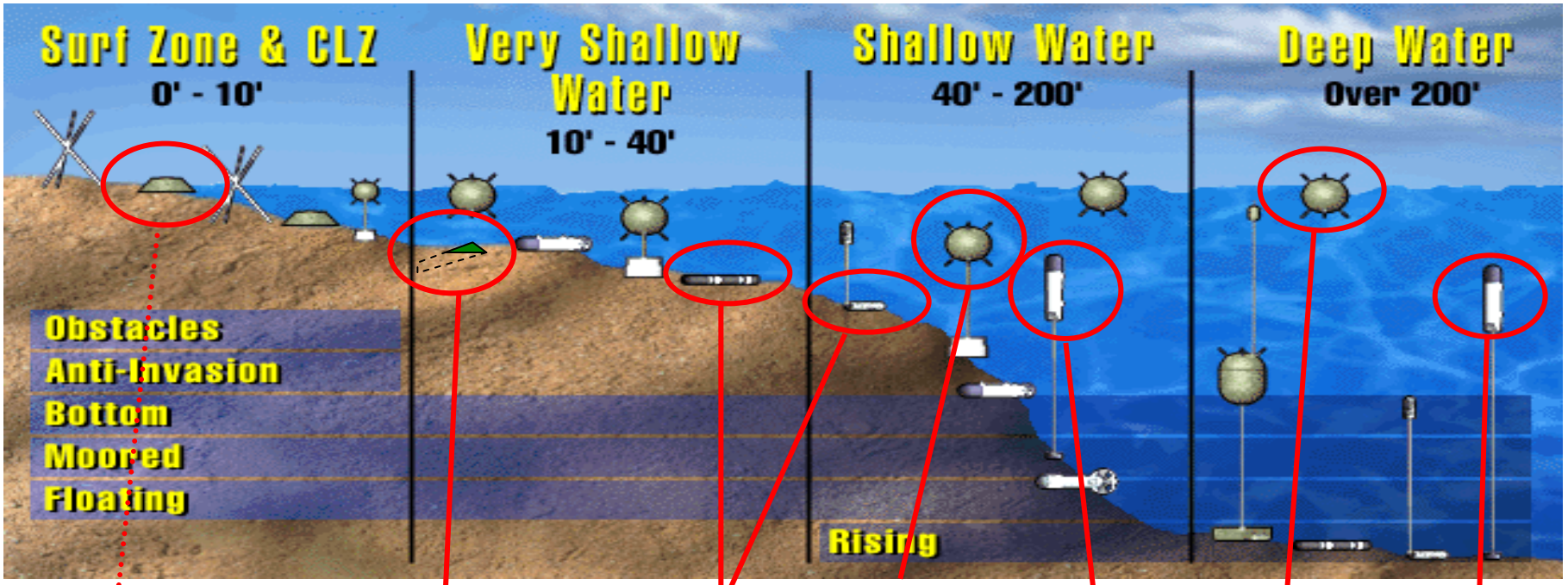
Director, Mine Warfare Branch

Agenda

- Mine Threat
- Vision, Concept and Missions
- Present and Future Capabilities
  - Littoral Combat Ship (LCS) and MIW Mission Modules
  - Organic Mine Countermeasures (OMCM)
  - Unmanned Systems
  - Assault Breaching System
  - Mine Warfare Environmental Decision Aids Library (MEDAL)
- Summary

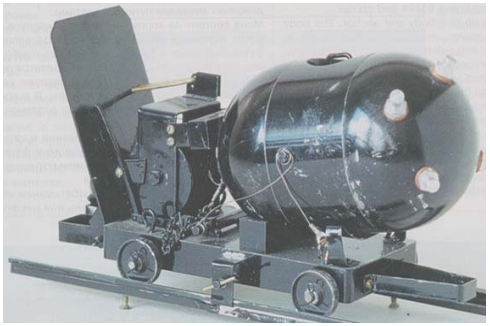
The Threat Across the Littorals



- The real goal of the minefield is Sea Denial, NOT the damage or destruction of a specific ship.
- Navy goal is Assured Access to defeat the minefield, NOT counter every mine.

Sea Mines: The Unique Weapon

- Over 300 Types
- Over 50 Countries Possess
- Over 30 Countries Produce
- More than 20 Countries Export
- Low Cost
- Simple to Deploy
- Increasing Sophistication
- Lots of Bang for the Bucks



MCM Vision

Dedicated

- •Slow
- •Heavy
- •Large footprint
- •Stovepiped
- •Primarily CONUS-based
- •Manpower Training Intensive

Concept of Operations

Unmanned Operations

Distributed and Netted

Cooperative Behavior

Common Operational Picture (COP)

Sea Warrior Transformation

Organic

- •Fast and Agile
- •Precise
- •Lethal
- •Modular
- •Organic
- •Optimitized Manpower Requirements

MCM VISION:

Field a Common Set of Unmanned, Modular MCM Systems Employable from a Variety of Host Platforms or Shore Sites that can Quickly Counter the Spectrum of Mines to Enable Assured Access with Minimum Risk from Mines

Accelerate the MCM Timeline

Remove Sailor/Marine From the Minefield

VISION -------> ROADMAP ------> MCM PLAN

CONOPS

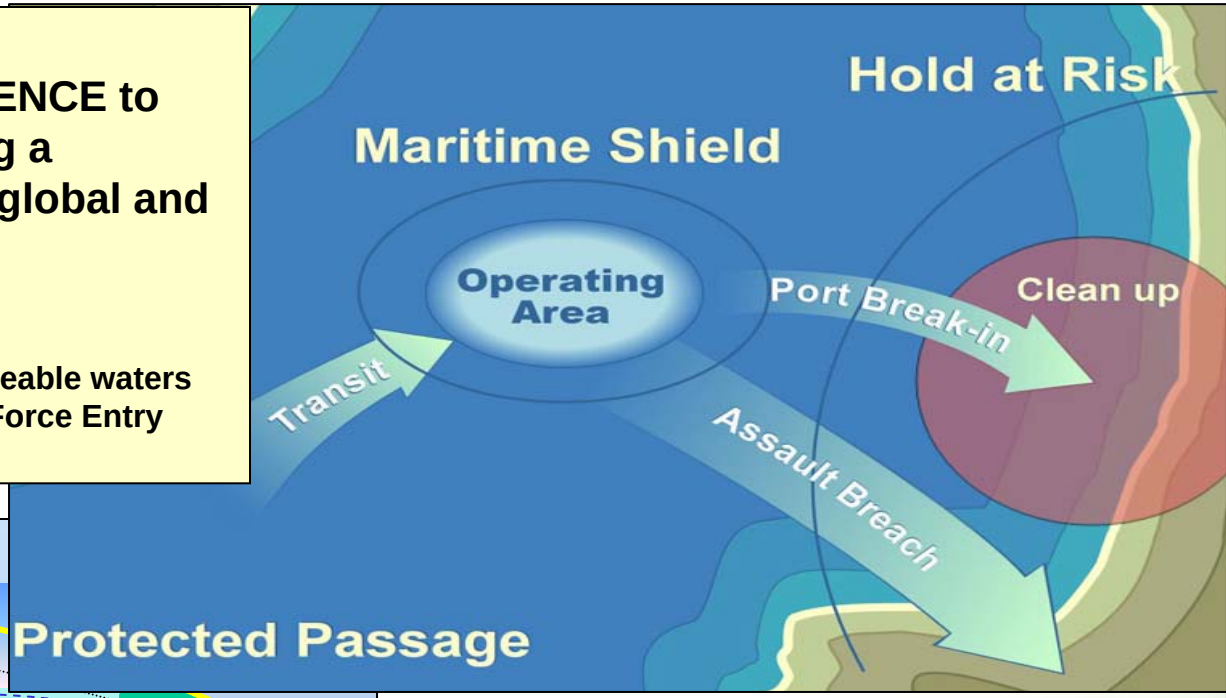
- **National Defense Strategy**
  - **Secure strategic access and retain global freedom of action**

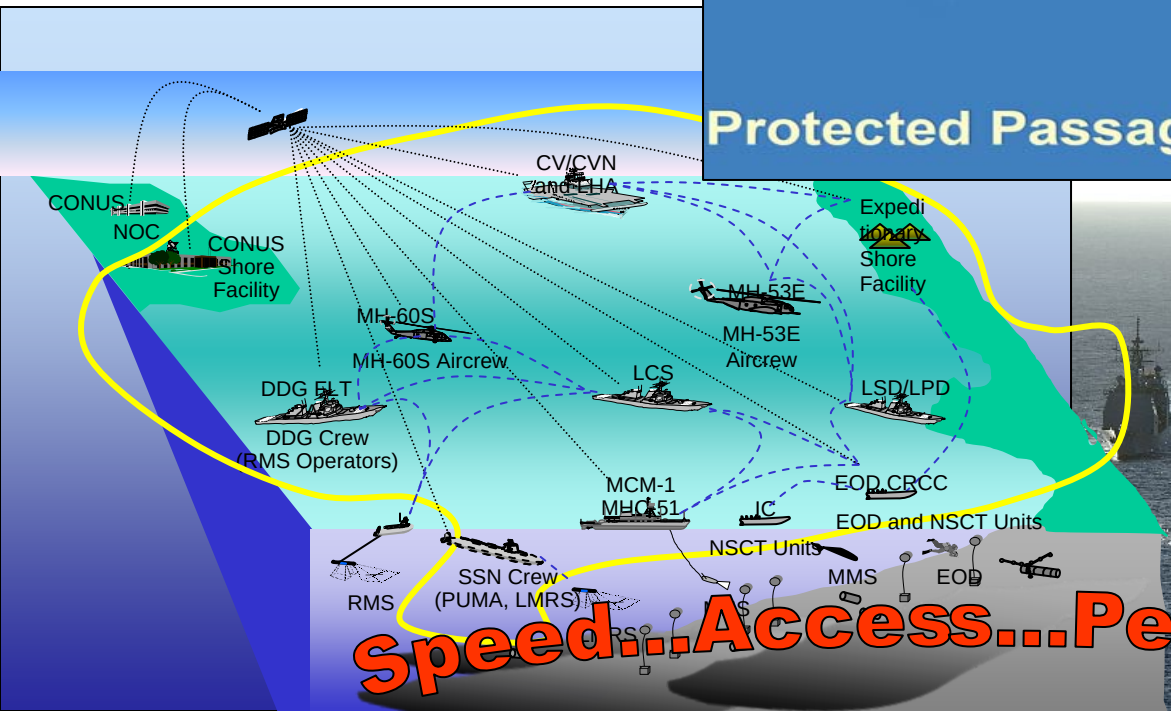
- **MIW is an enabling capability throughout the range of military operations (ROMO)**
  - **MIW assures;**
    - **the ability of joint and naval forces to achieve strategic access and global freedom of action in areas of U.S. strategic interest**
    - **Protect U.S. and multinational forces, Sea Line of Communications (SLOCs), and commercial shipping.**
  - **MIW requires;**
    - **the ability to operate in complex oceanographic environments against a variety of high-tech and improvised weapons**
    - **C5ISR from strategic through tactical level enabling support to the decision makers, planners and warfighters**

Mine Countermeasures(MCM) Missions

U.S. Navy MCM Forces ensure: SPEED, ACCESS, and PERSISTENCE to our Defense Forces by providing a maritime sea shield around our global and vital homeland operating areas.

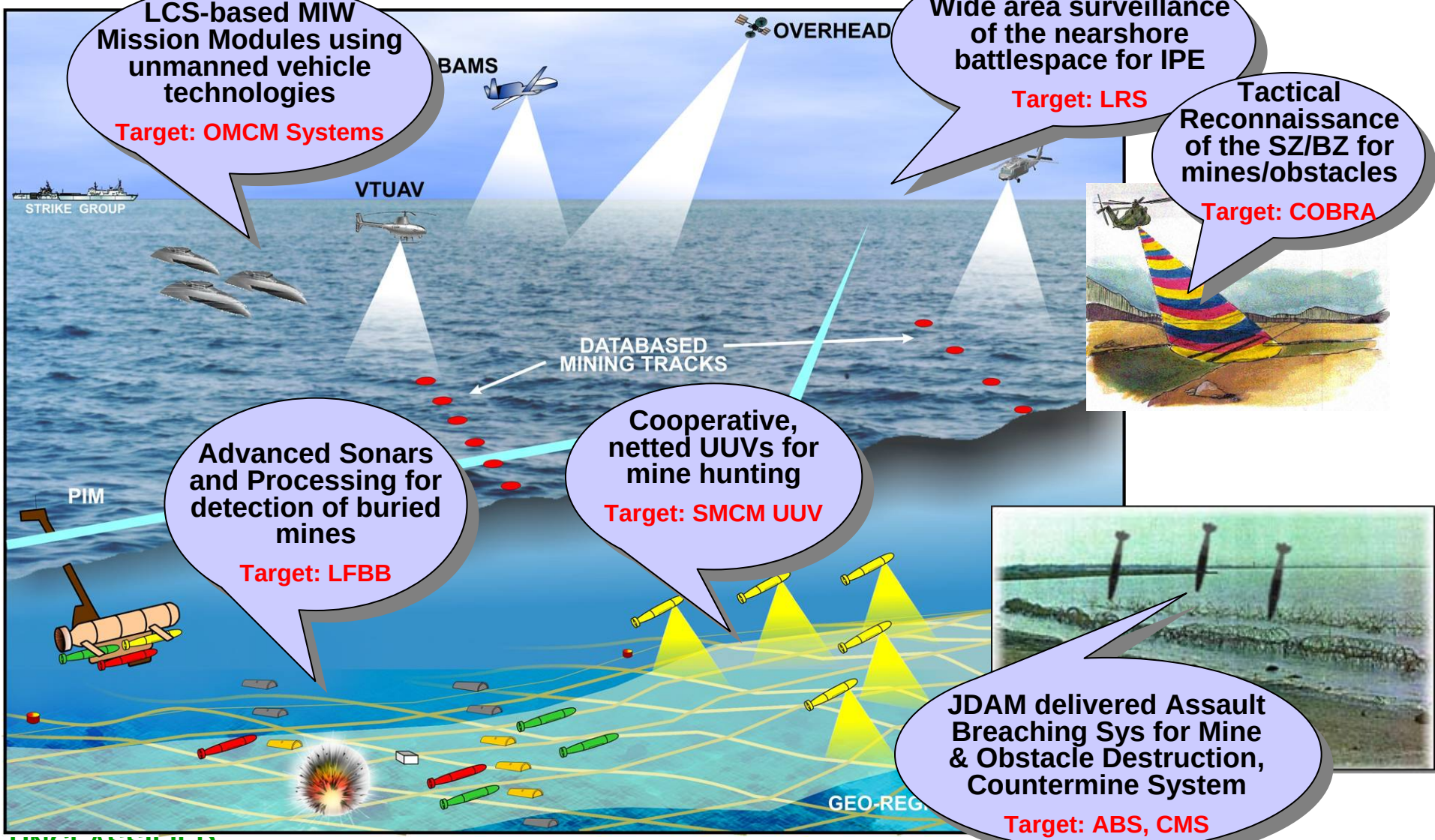
- **Ranging in size: 100 to 900+ NM^2**
- **Covering the water column: 200+ ft of mineable waters to the beach exit zone in support of Joint Force Entry Operations**





MCM Science and Technology

Addressing Capability Gaps in Maneuver and Capacity



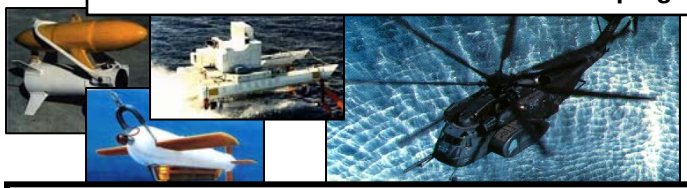
Present Fleet Capability

JDAM Assault Breaching System

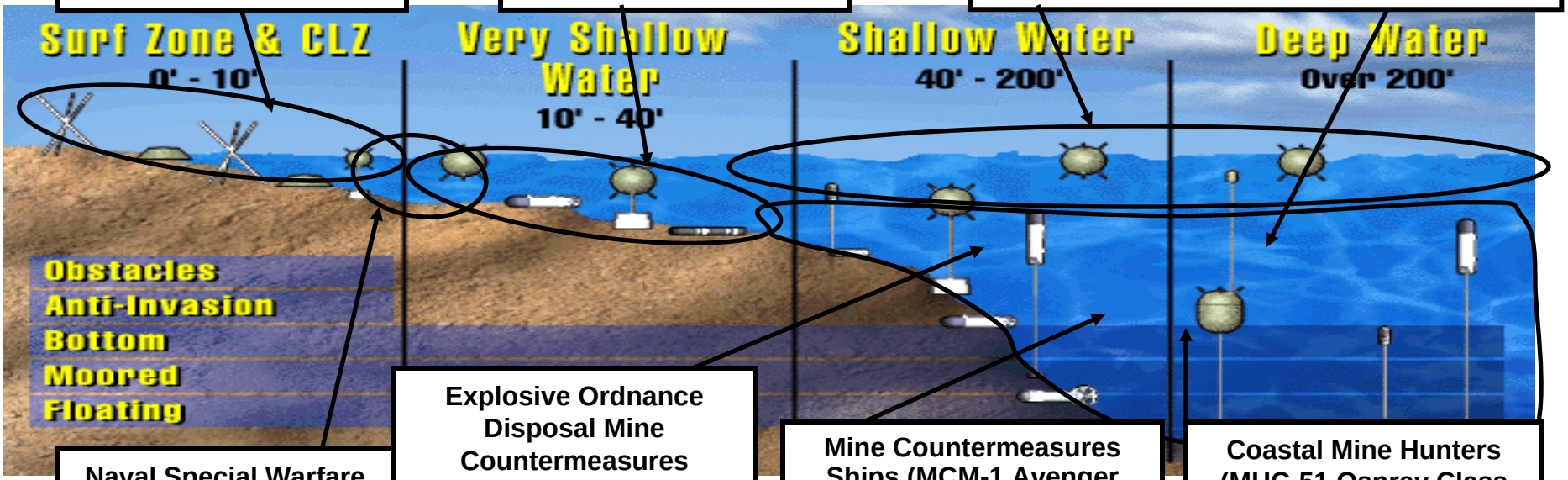
Mine Hunting and Neutralization

Naval Special Clearance Team ONE

Acoustic Mine Detection and Mine Sweeping



Airborne Mine Countermeasures (MH-53E Sea Dragon) (20 total)



Naval Special Warfare

Limited Mine Identification and Neutralization

Explosive Ordnance Disposal Mine Countermeasures Detachments

Mine Identification and Neutralization

Mine Countermeasures Ships (MCM-1 Avenger Class Ship) (14 total)

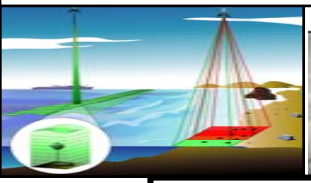
Acoustic Minehunting, Neutralization, and Mine Sweeping

Coastal Mine Hunters (MHC-51 Osprey Class Ship) (4 total)

Acoustic Minehunting and Neutralization

Delivering Future Force

Minefield Detection and Neutralization



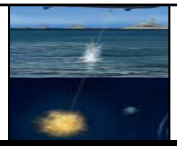
Assault Breaching System

Naval Special Clearance Team ONE

Laser (Hunt)

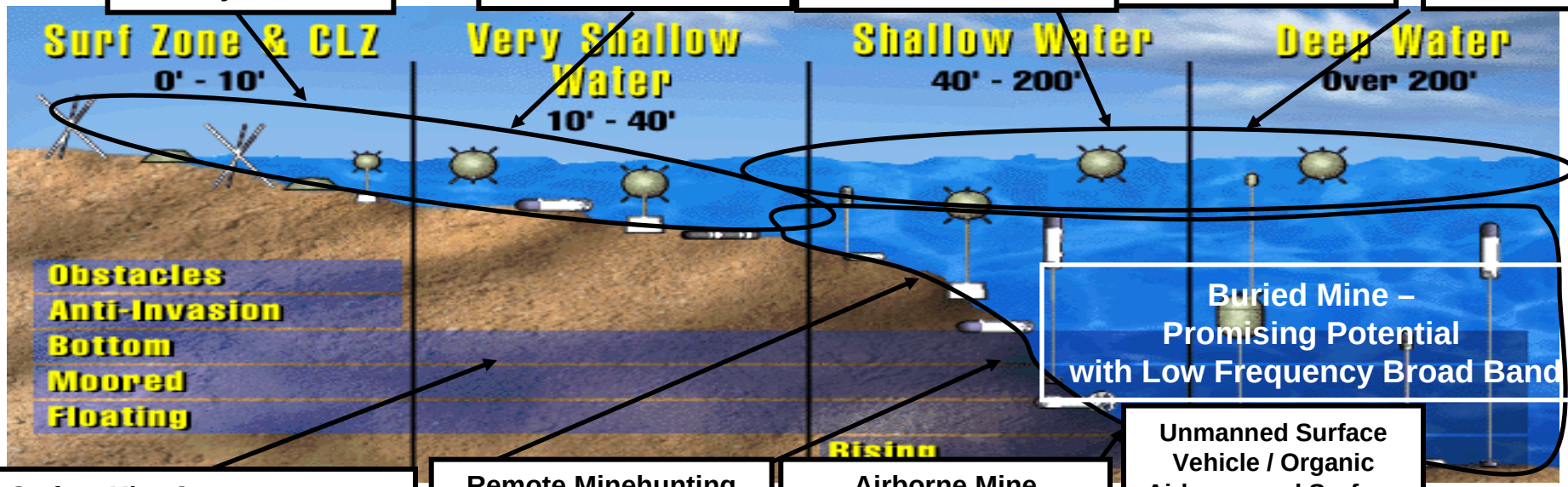
Airborne Laser Mine Detection System

Super-cavitating Projectiles (Kill)



Rapid Airborne Mine Clearance System

Littoral Combat Ship

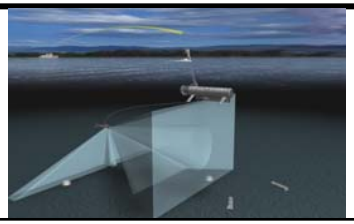


Buried Mine – Promising Potential with Low Frequency Broad Band

Surface Mine Countermeasures Unmanned Underwater Vehicle and Low Frequency Broadband

Buried Mine Detection

Remote Minehunting System – AN/AQS-20A

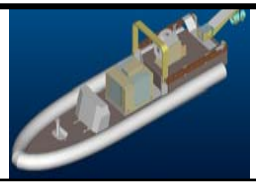


Sonar (Hunt)

Airborne Mine Neutralization System

Self propelled explosive charges (Kill)

Unmanned Surface Vehicle / Organic Airborne and Surface Influence Sweep

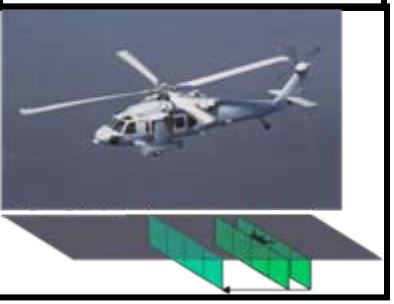


Magnetic Acoustic Influence Sweep

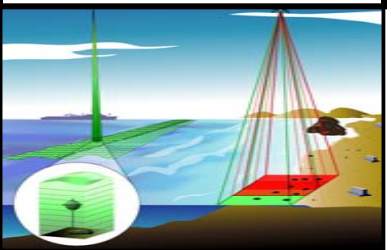
Littoral Combat Ship (LCS) & Mine Countermeasures Mission Package

Remote Mine Hunting System & AN/AQS-20A

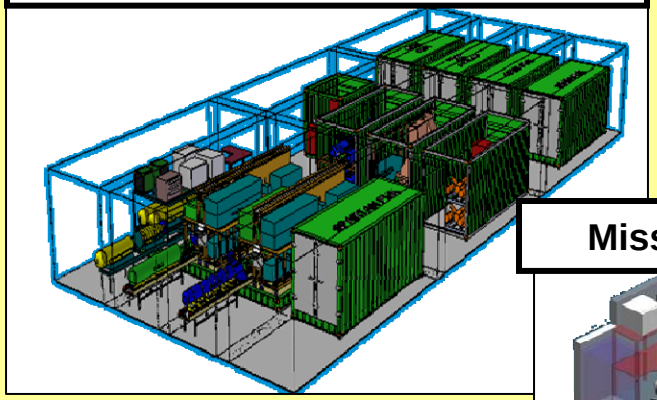
Airborne Laser Mine Detection System



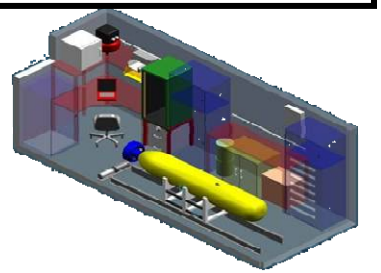
Coastal Battlefield Reconnaissance & Analysis System



Mission Package

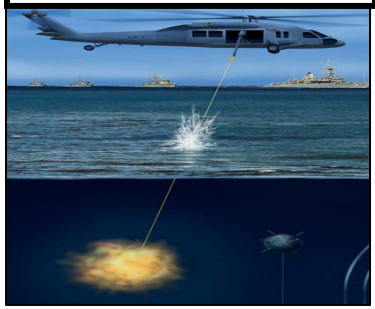


Mission Module

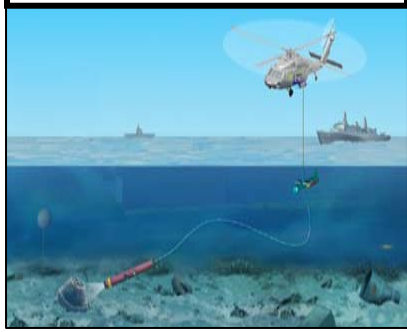


Full MIW Package: FY11

Rapid Airborne Mine Clearance System



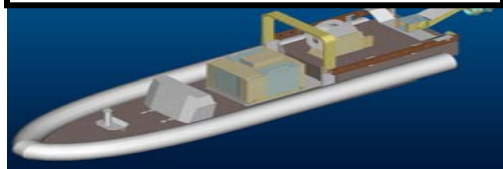
Airborne Mine Neutralization System



SWORDFISH Unmanned Underwater Vehicle

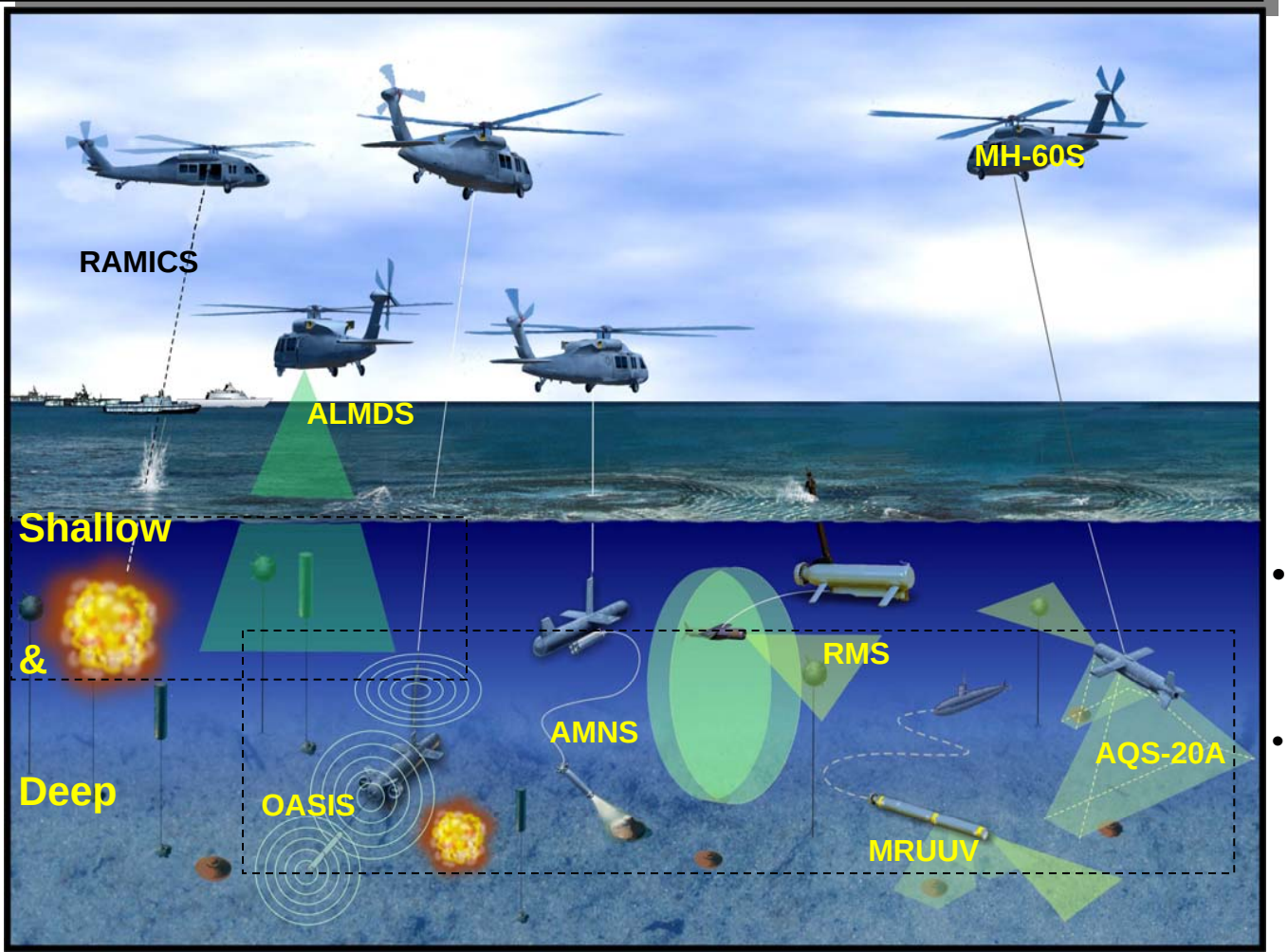
Battlespace Preparation Autonomous Underwater Vehicle

Unmanned Surface Vehicle & Organic Airborne and Surface Influence Sweep



Organic Mine Countermeasures Systems

Distributed Expeditionary Mine Countermeasures Capabilities

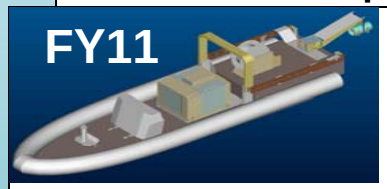


- **MH-60S Based Systems:**
  - •Rapid Airborne Mine Clearance System (RAMICS) - (FY10)
  - •Airborne Laser Mine Detection System (ALMDS) - (FY09)
  - •Organic Airborne and Surface Influence Sweep (OASIS)- (FY10)
  - • Airborne Mine Neutralization System (AMNS) - (FY09)
  - •AQS-20A Minehunting Sonar - (FY07)
- **DDG based system:**
  - • Remote Minehunting System (RMS) - (FY07)
- **SSN Based System**
  - • Mission Reconfigurable Unmanned Undersea Vehicle (MRUUV) - (FY16)

Mine Countermeasures Unmanned Vehicles

Leading the Way towards MIW Vision

Unmanned Surface Vehicle Influence Sweep Program

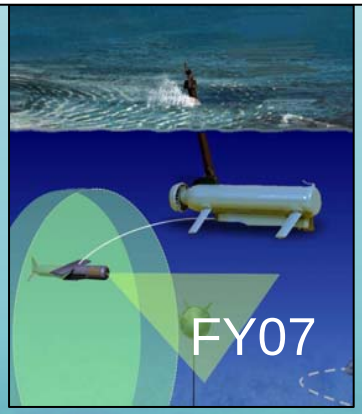


USV-based Minesweeping

Magnetic sweep cable

Acoustic Sweep Device

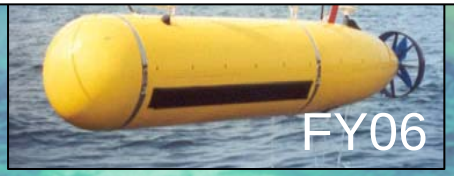
Remote Minehunting System



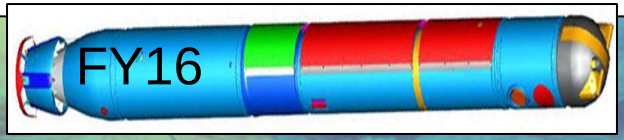
Surface Mine Countermeasures Unmanned Underwater Vehicle and Low Frequency Broadband

SWORDFISH Unmanned Underwater Vehicle

Battlespace Preparation Autonomous Underwater Vehicle



Submarine Launched Mission Reconfigurable Unmanned Underwater Vehicle



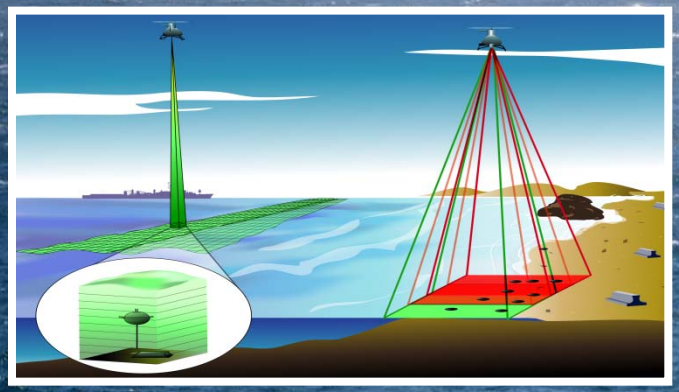
ASSAULT BREACHING SYSTEM (ABS)

Intelligence, Surveillance and Reconnaissance

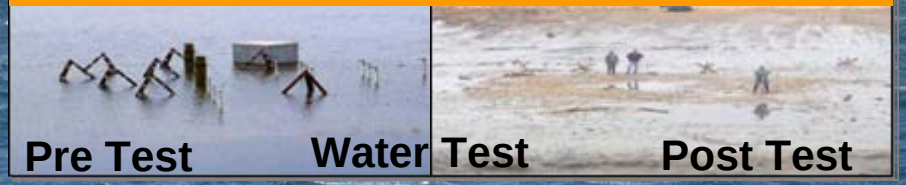
Coastal Battlefield Reconnaissance and Analysis (COBRA) and Littoral Remote Sensing (LRS)

Countermine-Counterobstacle (CMCO)

Joint Direct Attack Munition (JDAM) Assault Breaching System



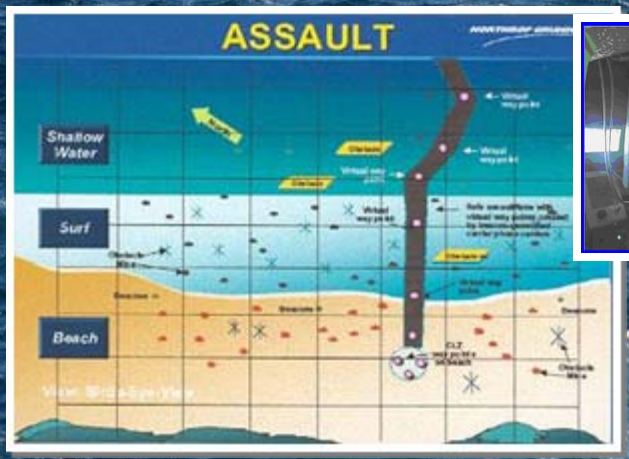
Mk-80 Series Bomb Tests Offers Near Term Capability

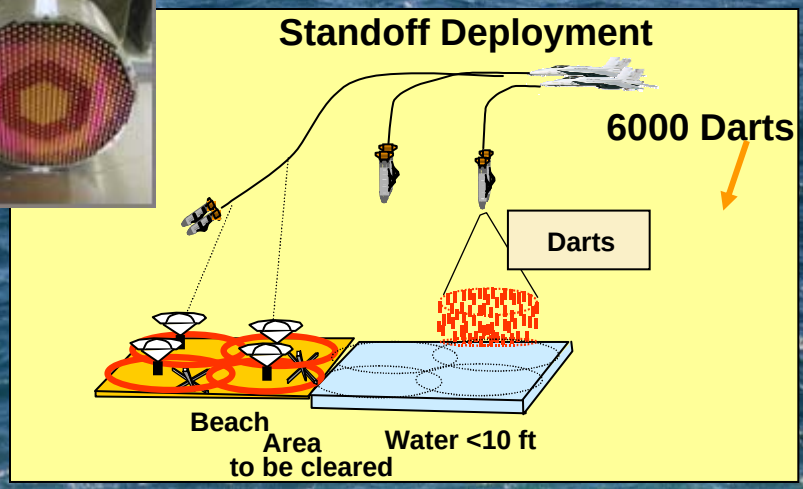


Precision Navigation and Marking

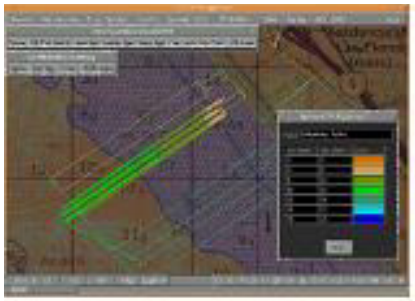
Electronic Chart Display and Information System-Navy (ECDIS-N) / LCAC Auto-Pilot

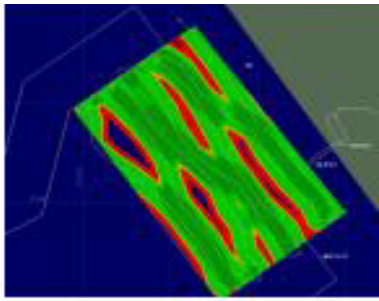
Countermine System

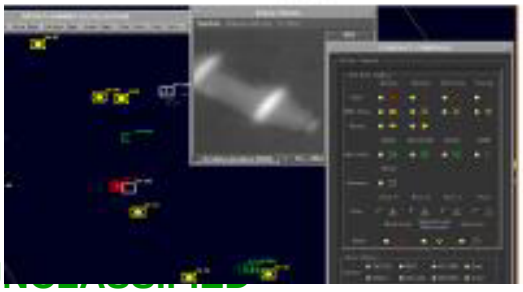


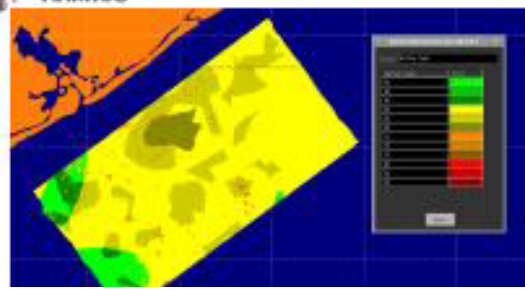


MEDAL: MIW Common Operational Tactical Picture









Summary

- Provide Strategic Access
- Protect National Interests and Commerce
- Enable Joint and Coalition Forces
- Leverage Near and Far Term Future Technology
  - Field mutually supportive systems to provide full threat coverage
  - Remove Man from the Minefield
  - Reduce the Detection to Engagement Timeline
    - Single Pass Detection and Classification (via PMA/CAD-CAC)
    - Rapid Reacquisition and Neutralization

U.S. Navy Mine Countermeasures Capabilities

Questions?

Lessons of War – WW II

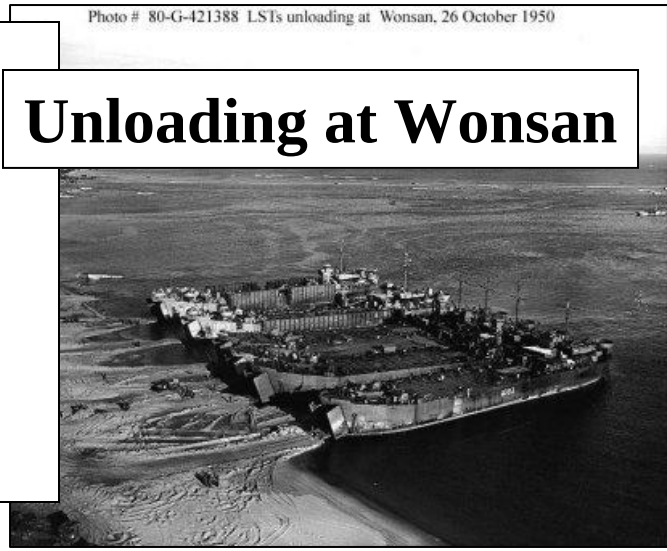
World War II – 1942 – 1945

- U.S. able to adapt to changing circumstances to conduct MCM ops
  - Organic MCM ships and forward bases for non-organic ships
- Massive MCM numbers vs. determined resistance
  - 65 Ships Lost to mines
- Okinawa – 75 Minesweepers, 45 assisting ships swept 3,000 nm^2
  - Largest MCM task force in U.S. Navy History
- **Post War Downsizing**
  - 500 Mine craft (33,000 men) at the end of the war
  - Majority decommissioned

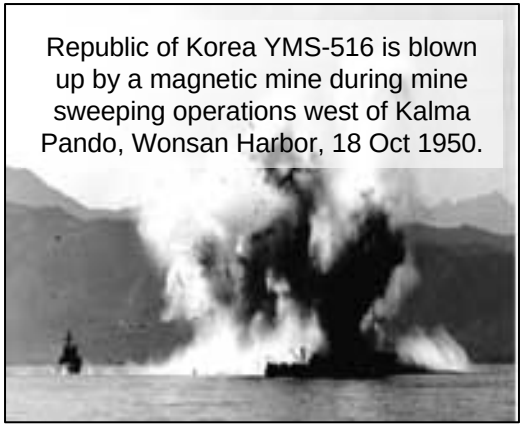
Lessons of War - Korea

Korean War – 1950 – 1953

- Only 22 Minesweepers in the Pacific Fleet
- Threat underestimated – little mining during early hostilities
- Navy unprepared to conduct MCM operations early in the war
  - Too few MCM assets
- 5 U.S. Navy ships sunk – 5 destroyers damaged – 43 KIA
- Enemy use of influence mines delayed effective sweeping ops



Unloading at Wonsan



Republic of Korea YMS-516 is blown up by a magnetic mine during mine sweeping operations west of Kalma Pando, Wonsan Harbor, 18 Oct 1950.

"The U.S. Navy has **lost control** of the seas to a nation without a navy, using **pre-World War I weapons**, laid by vessels that were utilized at the time of the birth of Christ"

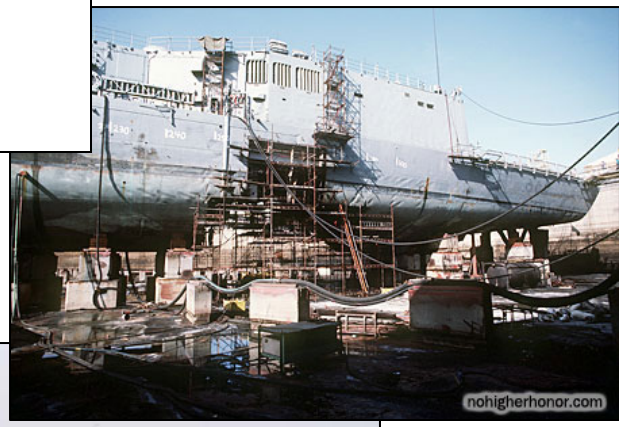
Admiral Allan E. Smith's message to the CNO, 1950

In 1950, North Korea laid a **400 square mile minefield** during a **3 week** period consisting of **3,000 mines** of various types (using fishing boats with simple navigational instruments and working only at night) delaying the amphibious assault of Wonsan (250 US ships and 50,000 men) six days.

Lessons of War – Modern Era

Cold War 1954 – 1990

- MCM capabilities largely outsourced to Allies – NATO
- Minesweepers could not operate organically with battle force
- Operation Earnest Will – 1987
  - Escort of tankers with no organic MCM forces
  - USS SAMUEL B ROBERTS (FFG 58) and 3 tankers struck by mines
  - Minesweepers Forward Deployed (1987-1990)



Persian Gulf War 1990 – 1991

- Navy not prepared to conduct MCM operations
  - No coordination with CTF's
  - 6 Active minesweepers
- MCM Force ill-equipped
  - Lack of Readiness
  - Lack of operational expertise
- 2 Mine Casualties
  - USS PRINCETON (CG)
  - USS TRIPOLI (LPH)