



**Mine Warfare Association
Spring 2007 Regional Conference**

Acquiring Organic MCM Capability

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Addressing the MCM Challenge – A Capability in Transformation

Historical

Dedicated Force

- MCM Class Ships
- MH-53E



- Time Late in Theater
- Heavy, Large Footprint
- Stovepiped
- Modernization Efforts Underway

In-Process

Family of Deployed Organic Systems



- Enhanced Performance Capabilities
- Improved Time Lines
- Taking Man Out of the Minefield

Tomorrow's Thrust

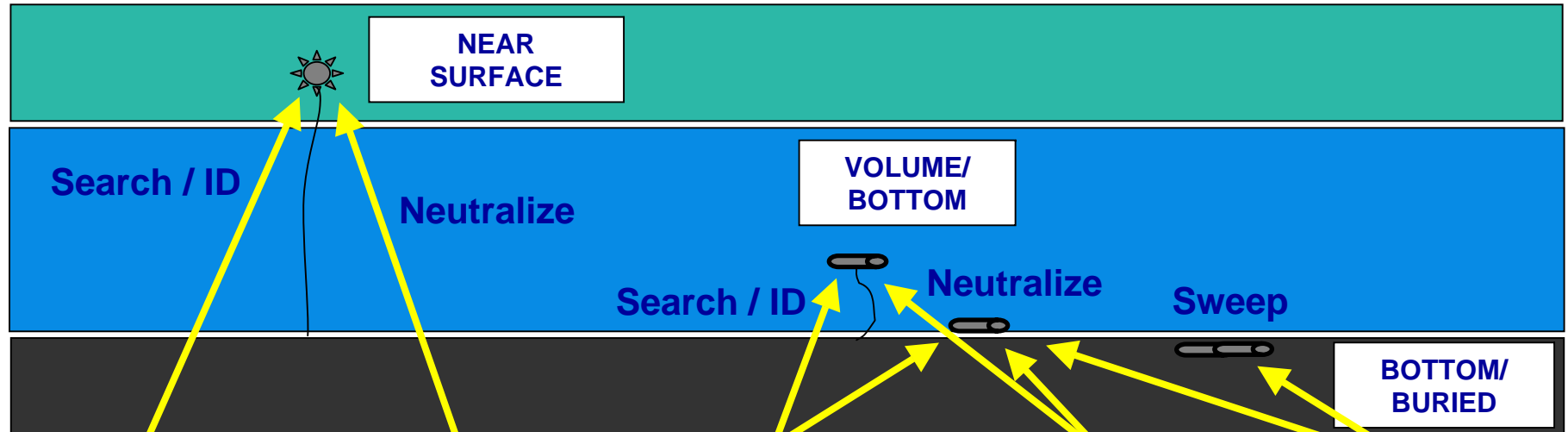
Integrated System of Systems Capability



- Efficient Fleet Focused Modernization Program
- Highly Modular systems
- Effective Near Real Time In-Stride Capability



Organic MIW Capabilities Through the Water Column



ALMDS



Airborne Laser Mine Detection System

RAMICS



Rapid Airborne Mine Clearance System

AN/AQS-20A/RMS



Sonar Detection System

AMNS



Airborne Mine Neutralization System

OASIS/USSS



Organic Influence Sweep Systems



Good News Summary

- 6 of 7 organic systems in operation during 2 week period
- 3 organic systems in production, ALMDS and RMS LRIP Units delivered
- Over 3000 hours of operation
- 4 of 5 Airborne systems completed initial integration with MH-60S
- RMS deployed to UK with Neptune Warrior Apr 07
- LCS Crews trained on RMS and AQS-20A

OASIS Air Crew



ALMDS Fit Check



RMS Crew Training



AMNS CT

AQS-20 TECHEVAL



RMS LRIP Delivery





AN/WLD-1, Remote Minehunting System

The RMS is a diesel powered semi-submersible vehicle (23' long, 4' diameter, 13klbs) that tows a variable depth sensor, the AN-AQS-20A. It will operate from the DDG 91-96 and LCS. The system determines the presence or absence of mines to an acceptable level of confidence to enable ships to operate in or avoid specific areas.



Delivery to USS Bainbridge

ACAT IC

**Contractor: Lockheed Martin
IN PRODUCTION**

**PB08 Quantities through FYDP: 65
Delivers with 1st LCS MIW MP**



RMS with AN/AQS-20



**Tech Eval on
USS Bainbridge**

- ✓ **RMS OA completed Aug 06**
- ✓ **TECHEVAL completed on DDG-96
Mar 07**
- ✓ **LRIP 1 Delivered 6 Apr 07**
 - » **OPEVAL Jun 07**
 - » **Full Rate Production Decision 1st Qtr
FY08**

RMS Achieves IOC in Fall 2007



Night Ops



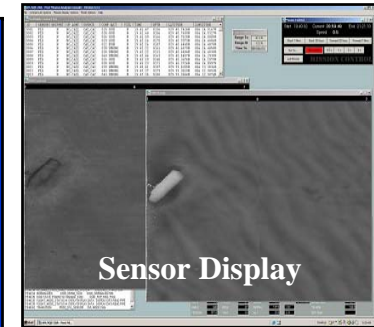
AN/AQS-20A Sonar Mine Detecting Set

The AN/AQS-20A program integrates an existing Electro-Optic Identification Device (EOID) sensor into the AN/AQS-20 baseline system and provides for identification of bottom mines and detection, localization, and classification of bottom, close tethered, and volume mines.



Going Through MH-60S Quals

ACAT II
Contractor: Raytheon
IN PRODUCTION
PB08 Quantities through FYDP: 62
Delivers with 1st LCS MIW MP



EOID Sensor



AN/AQS-20A

- ✓ **TECHEVAL on MH-60S nearing Completion**
- ✓ **11 LRIP Units on Order**
 - » **OPEVAL Commences Aug 07**
 - » **FRPD 2nd Qtr FY08**

Over 1,700 Tow Hours Demonstrated On 3 Platforms





Airborne Mine Neutralization System

The AMNS will be employed by the MH-60 helicopters to explosively neutralize unburied bottom and moored sea mines that are impractical or unsafe to counter using existing minesweeping



ACAT II

Contractor: Raytheon

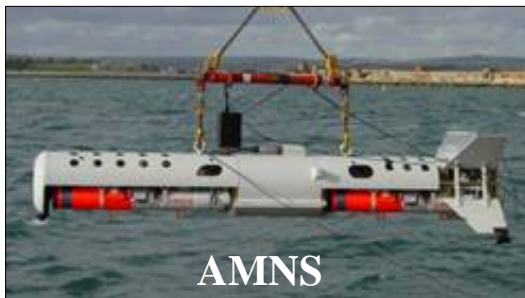
Milestone C: Jun 07

PB08 Quantities through FYDP: 37

Delivers with 1st LCS MIW MP



Exercise Neutralizer



AMNS

- ✓ **Completed MH-53E CT/DT flight testing Aug 06**
- ✓ **MH-60S CT nearing completion**
 - » **Live Fire Testing Jun 07**
 - » **MS C Jun 07**
 - » **MH-60S DT begins Oct 07**



Video Display

MH-60S Integration Testing Ahead of Schedule



Airborne Laser Mine Detection System

The ALMDS is a laser-based AMCM high area coverage system that uses Streak Tube Imaging LIDAR to detect, classify, and localize floating and near surface moored mines.



ALMDS H-60S Ground Testing

ACAT II
Contractor: Northrop Grumman
IN PRODUCTION
PB08 Quantities through FYDP: 33
Delivers with 1st LCS MIW MP



ALMDS Common Console Sensor Display

- ✓ LRIP unit 1 delivered Jan 07
- ✓ LRIP unit 2 delivery May 07
- ✓ MH-60S Ground Testing completed in 2 days
- » MH-60S Test Flights to begin this Summer

LRIP Performance Testing Underway

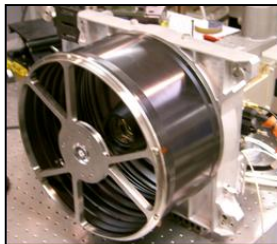
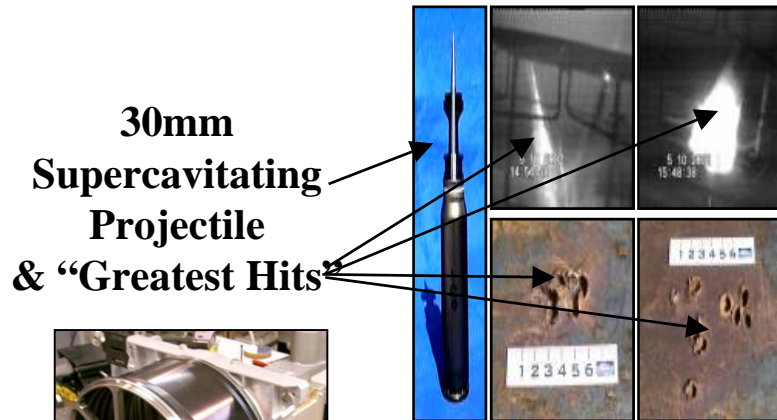


ALMDS LRIP Delivery



Rapid Airborne Mine Clearance System

RAMICS is a MH-60S helicopter-deployed system capable of reacquiring and neutralizing near-surface and surface (floating) moored mines. It will utilize an electro-optic LIDAR system to reacquire the target and aim a rapid firing MK44 30mm gun using a MK258 Mod1 munition.



RAMICS Receiver



Mounted on MH-60s

ACAT II
Contractor: Northrop Grumman
Milestone C: 4th Qtr FY08
PB08 Quantities through FYDP: 33
Delivers with 4th LCS MIW MP

- ✓ Gun subsystem testing completed Jan 06
- ✓ EDM Integration testing at NG nearly complete
 - » EDM ground test May 07 @ Lake Glendora
 - » MH-60S (WSIT) ground test 4th Qtr FY07
 - » Captive Carriage and Jettison Testing – 1st Qtr FY08

Full System Integration Has Begun



Targeting POD



Organic Airborne & Surface Influence Sweep

OASIS will provide organic, high speed magnetic/acoustic influence minesweeping capability where minehunting is not feasible (adverse environmental conditions), where mines are undetectable (buried), and avoidance of the area is not an option.

OASIS



Close-up



OASIS Aboard MH-60S

*Performance Demonstrated on
MH-53E*

ACAT II

Contractor: EDO Corp

Milestone C: 4th Qtr FY08

PB08 Quantities through FYDP: 35

Delivers with 3rd LCS MIW MP

- ✓ **Completed CT on Athena with common console**
- ✓ **MH-53E Performance testing nearly complete**
- ✓ **Completed electrical ground test on MH-60S and MH-53**
- » **Air Worthiness Testing on MH-60S scheduled for Aug 07**
- » **MH-60S CT 1st Qtr FY08**



In the Water



Mounting onto MH-60S



Coastal Battlefield Reconnaissance & Analysis

COBRA is a modular payload for the VTUAV, Fire Scout and will be capable of conducting standoff reconnaissance for the purpose of detecting minefields and obstacles in the surf zone (P3I), on the beach, and through the beach exit. Block I COBRA System will be forward deployed with Navy VTUAV units afloat and ashore.



ACAT III

Contractor: Northrop Grumman

Milestone C: Oct 07

PB08 Quantities through FYDP: 59

Delivers with 3rd LCS MIW MP



- » **Block I (MS C – FY08):** Passive daytime detection of unburied minefields, mine lines, & obstacles in beach zone in system integration phase
- » **MH-53E Performance Testing in Jul 07**
- » **Integration with Fire Scout 1st Qtr FY08**
- » **Block II (MS C – FY10):** Active day/night detection capability through the surf zone.
- » **Block II MS B Sep 07, Contract award 2nd Qtr FY08**

System Integration Testing Underway



Countermine System (CMS)

Conceptually, CMS will dispense numerous darts that will destroy or neutralize the threat mines. Possible dart designs include high explosive and chemical fills that interaction with the mine's explosive fill upon contact. CMS may use existing JDAM Tail Kits (KMU-556/B) and all existing aircraft interfaces used for weapon delivery.



B-52 Stratofortress



Penetrator Technology
(HE, Venom)

ACAT III
CMS MS B: Jul 07
Contractor TBD
PB08 Quantities through FYDP: 1,520 units

- » **ONR Dart Research & Development will continue through FY07 (Chemical, Reactive and HE Darts)**
- » **SD&D Contract award 4th Qtr FY07**
- » **MS C in 1st Qtr FY12**



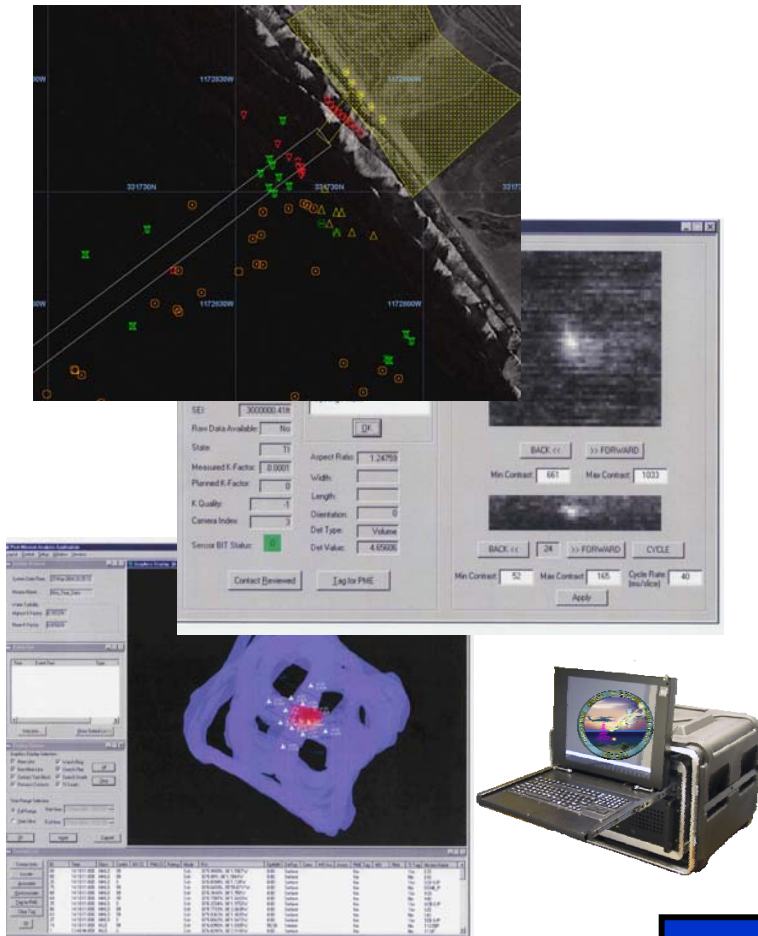
Mk84 with JDAM
Tail Kit

Transition From ONR Following FY07 Testing



MIW Mission Support Systems

Provides Mission Planning, Evaluation, Post Mission Analysis, Situational Awareness, and Contact Recognition Training for the MCM Fleet



- » **MEDAL**
 - » **MEDAL B10 certified as part of MPCE Build 1**
 - » **MEDAL B11 released to Allies**
 - » **MEDAL Enterprise Architecture implements SOA- Functionality awards through**
- » **Organic Post Mission Analysis (OPMA)**
 - » **AQS-20 module completed, RMS in progress**
 - » **Threshold capability incorporates all organic MCM systems**
 - » **To be integrated into MPCE Build 2**
- » **SNUITT**
 - » **Provides Sonar Mine Recognition Training**
 - » **AQS-20/24 lessons delivered**
 - » **REMUS lessons in progress**
 - » **HFWB, ALMDS lessons planned**

Improving Detect-to-Engage Timelines



Next Steps for Organic Mine Warfare

What

- **Decrease Timelines**
- **Improved Processing**
- **Management of Information and Data**
- **Technology Refresh**
- **Evolving Threat**
- **Provide World Class Systems Support**

How

- **Open Architecture**
- **Open Business Model**
- **Budget Restructuring**
- **Closed loop Requirements process**
- **Performance Based Logistics**
- **Fleet driven Metrics**

*Providing Affordable, Responsive, and Interoperable Systems
Aligned with Fleet Priorities*

Achieving our Vision

**Reduce Detect-
to-Engage
Timelines**

**Provide
Assured
Access**

**Get the Man
out of the
Minefield**

***Providing Mine Warfare Capability to the Fleet,
when they want it, at reduced cost.***