• Manage Mine Warfare Requirements and Resources

  – Enable United States Naval forces to conduct Mine Warfare (MIW) in support of military operations and warfighting scenarios worldwide
    – Includes Mine Countermeasures (MCM) and Maritime Mining capability
  – Provide MIW systems to support maritime maneuver and power projection

• More than a quarter-million sea mines in the inventories of 50 navies around the world.
• More than 300 kinds of sea mines are produced by 30 countries.

MIW Programmatic Dynamics

- PMA-261 – H-53 Helicopters
- PMA-265 – F/A-18 Aircraft
- PMA-266 – Unmanned Aviation Systems
- PMA-299 – H-60 Helicopters
- PMS-403 – Remote Minehunting Systems
- PMS-406 – Unmanned Maritime Systems
- PMS-408 – Expeditionary Missions
- PMS-420 – Mission Module Integration
- PMS-495 – Mine Warfare Programs

- AQS-20
- RMMV
- UISS
- KNIFE FISH
- MCM MISSION PKG
- MVCS
- MHUs

- SEAFOX
- MCM-1 AVENGER Class HM&E
- Mk-18
- SEAFOX
- MCM-1 AVENGER Class subsystems
- SEAFOX
- MCM MISSION PKG
- MH-53E subsystems

- 11m RHIB
- 8m RHIB
- MQ-8 Fire Scout
- MH-60

- PEO SHIPS
- PEO UNW
- PEO (A)
- PEO LCS
- PEO 403
- EXPEDITIONARY WARFARE DIVISION
- OPNAV
- N95
- N96
- N97
- N98
- N99

- AMNS Archerfish
- JABS
- Slurry Mission Modules
- Mines
- ALMDS
- COBRA
- MH-53E
- MCM-1 AVENGER Class subsystems
**Mine Countermeasures Roadmap**

**Current MCM Force**
- MCM-1 Class
- ExMCM Capabilities
- Targeted Sensor Upgrades
- Expanded Adaptive Force Experimentation
- Operational Assessment of MCM MP components
- Initial LCS deployments with MCM systems

**Future Force**
- Unmanned Systems
- Fast, Agile, Flexible
- Modular
- Optimized use of Manpower

**MCM VISION:**
1. **Reduce MCM timelines for Combatant Commanders**
2. **Reduce risk from sea mines to allow Joint Force mission execution**

**Bridge**
- ExMCM Capabilities
- Targeted Sensor Upgrades
- Expanded Adaptive Force Experimentation
- Operational Assessment of MCM MP components
- Initial LCS deployments with MCM systems

**Current Systems**
- Platform End of Service Life
- Man in the minefield
- Limited flexibility
- Slow response time (MCM-1)

**Future Performance**
- Unmanned Systems
- Fast, Agile, Flexible
- Modular
- Optimized use of Manpower

**Transition**
- Minehunting Unit (MHU)
- US and Coalition Surface Assets & Shorebased operations

**Bridge Equipment**
- AQS-24C Volume upgrade
- LIRIP 1 RMMV
- MK-18 UUV
- Knifefish UUV
- MkVI Patrol Boat

**Future Systems**
- AQS-20A
- ALMDS
- CUSV USV
- JABS
- Barracuda
- VTUAV
- Cobra

**Current Systems**
- AQS-24
- MCM-1 Class
- SeaFox
- SLQ-48
- MNV
- MH-53E
- Mk-104
- EOD
- Mk-18 UUV

**Future Systems**
- LCS-2
- LCS-1
- MH-60S
- CUSV
- ALMDS
- AQS-20
- JABS
- Mk-18 UUV
- VTUAV
- Cobra

**Legend**
- AMNS – Airborne Mine Neutralization System
- COBRA – Coastal Battlefield Reconnaissance & Analysis
- CUSV – Common USV
- EOD – Explosive Ordnance Disposal
- JABS – JDAM Assault Breaching System
- JDAM – Joint Direct Attack Munition
- MCM – Mine Countermeasures
- MKVI – MkVI Patrol Boat
- MCM VISION – Mine Countermeasures Vision
- RIB – Rigid hull Inflatable Boat
- VTUAV – Vertical Takeoff Unmanned Aerial Vehicle
- UISS – Unmanned Influence Sweep System
- UUV – Unmanned Undersea Vehicle
- USV – Unmanned Surface Vehicle
- LCS – Littoral Combat Ship
- MP – Mission Package (for LCS)
- MHU – Mine Hunting USV
- MNV – Mine Neutralization Vehicle
- RMMV – Remote Multi-Mission Vehicle
- UUV – Unmanned Undersea Vehicle
Maritime Mining

- **Legacy systems remain in service**
  - Submarine Launched Mobile Mine (SLMM)
    - Being maintained with no planned upgrades
  - Quickstike (QS) Aerial Delivered Mines
    - Receiving target detection device (TDD) upgrades
    - Several demonstrations of precision standoff delivery capability

- **Clandestine Delivered Mine (CDM)**
  - SLMM warhead section repackaged for unmanned delivery
  - Military Utility Assessment scheduled for 4QFY17
  - Remote Control is in development and will be integrated on CDM

- **Advanced mining**
  - Fleet demand signal is strong
  - Leveraging multiple efforts (ONR FNC, rapid prototyping, etc.) to develop future program of record
  - Envision a distributed, integrated network of undersea sensors and effectors

**LEVERAGING EFFORTS TO DELIVER CAPABILITY**
Opportunities for Industry

• Period of Transition and Innovation
  • Compress time to complete Kill Chain for all MCM systems
    – Any investment measured in terms of reduction in Kill Chain timeline
    – Real-time analysis (automated target recognition, data dissemination)
    – Multi-Mission systems (Mine Hunting, Sweeping and Neutralization)

• Mine Warfare C4I (US/Coalition) and Command & Control Facilitation
  – Common standards and interfaces—common training
  – Modular and Interoperable
  – Mission planning and analysis outputs compatible across systems (data sharing)

• Affordability throughout the Life Cycle
  – Supportable & Sustainable Systems with efficient maintenance procedures
  – Lighter/smaller systems
  – Open Architecture and Multi-platform Systems (flexibility – Interoperability)
Questions