

# *U.S. Navy Mine Warfare Programs*



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**CAPTAIN Danielle George**  
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**16 January 2020**



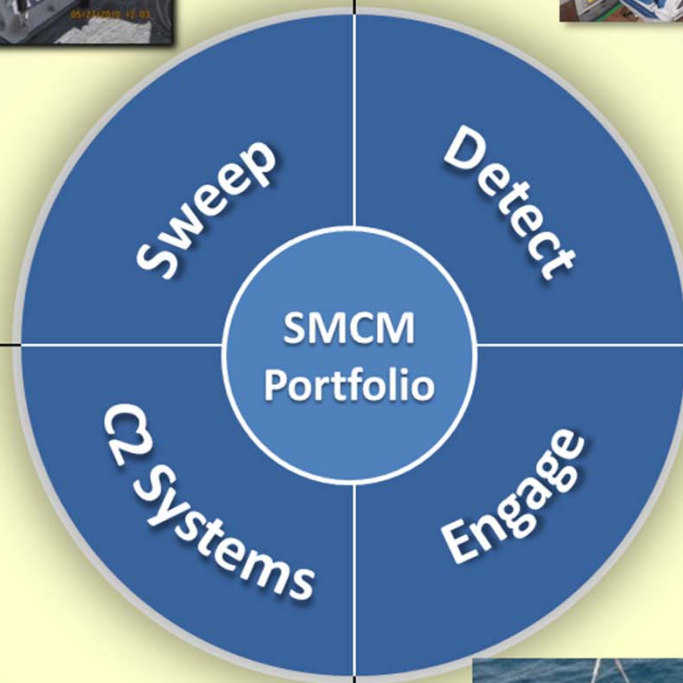
# PMS 495 Program Portfolio



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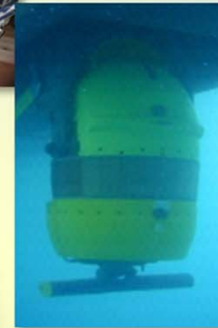
# Current Surface MCM (SMCM) Systems MCM-1 Class Ships



AAG/IAAG



AN/SLQ-37/38 Minesweeping System



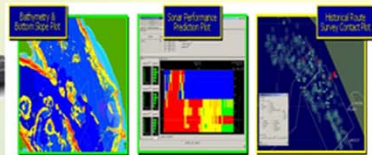
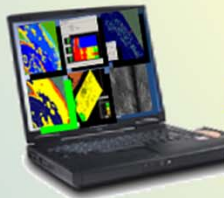
AN/SQQ-32 (V)4  
MSS/ VDS



OK-520 Winch



AN/SSN-2(V)5 PINS



MEDAL



AN/SLQ-48 MNS



AN/SLQ-60 SeaFox MNS



# SMCM Legacy Systems Highlights



- **AN/SLQ-37/38 Minesweeping Systems**
  - Utilizing forward deployed Mobile Cable Repair Units to sustain mine sweeping capabilities to end of service life
- **AN/SLQ-48 Mine Neutralization System (MNS)**
  - Maintaining the readiness of this legacy neutralization system at all time highs through Fleet support events and overhaul and reconditioning programs
- **AN/SLQ-60 SeaFox MNS**
  - Delivering new and refurbished neutralizer rounds to the Fleet
  - Delivered the SeaFox Simulator to the Fleet in 2019 to increase operator proficiency
- **AN/SSQ-94 Mine Countermeasures Simulator (MCS)**
  - All MCM ships upgraded with the AN/SSQ-94(V)4 MCS in 2019 bringing improved CIC training capability to the Fleet
- **AN/SQQ-32(V)4 Sonar**
  - All MCM ships upgraded with the AN/SQQ-32 (V)4 Through The Sensor (TTS) software upgrade to optimize sonar performance during minehunting
- **AN/SSN-2(V)5 PINS**
  - Conducting a tech refresh and software upgrade on the legacy PINS system to sustain the system through the end of MCM-1 service life



AN/SLQ-37/38



AN/SLQ-48 MNV



AN/SLQ-60 SeaFox Neutralizer



AN/SSQ-94 Trainer



SQQ-32(V)4 Sonar

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# Current Airborne MCM (AMCM) Platforms



MK-104 Mod 3



MK-105 Mod 4



MK-103 Mod 2



AN/AQS-24B

AN/SPU-1/W



Sweep

Detect

AMCM  
Portfolio

C2 Systems

Engage



AN/ASQ-232A



Precision Navigation System (PNS)





# AMCM Legacy Systems Highlights



- **AQS-24B High Speed Synthetic Aperture Sonar**
  - High resolution acoustic imagery
  - Fielded to MH-53E squadrons in 2017, excellent availability and reliability
  - Over 700 hours towed in 2019



- **AQS-24C Volume Search Sonar**
  - Provides rapid detection of moored mines
  - Production contract awarded to Northrop Grumman. First 2 delivered 06/2018
  - Fielding to fleet in 2020

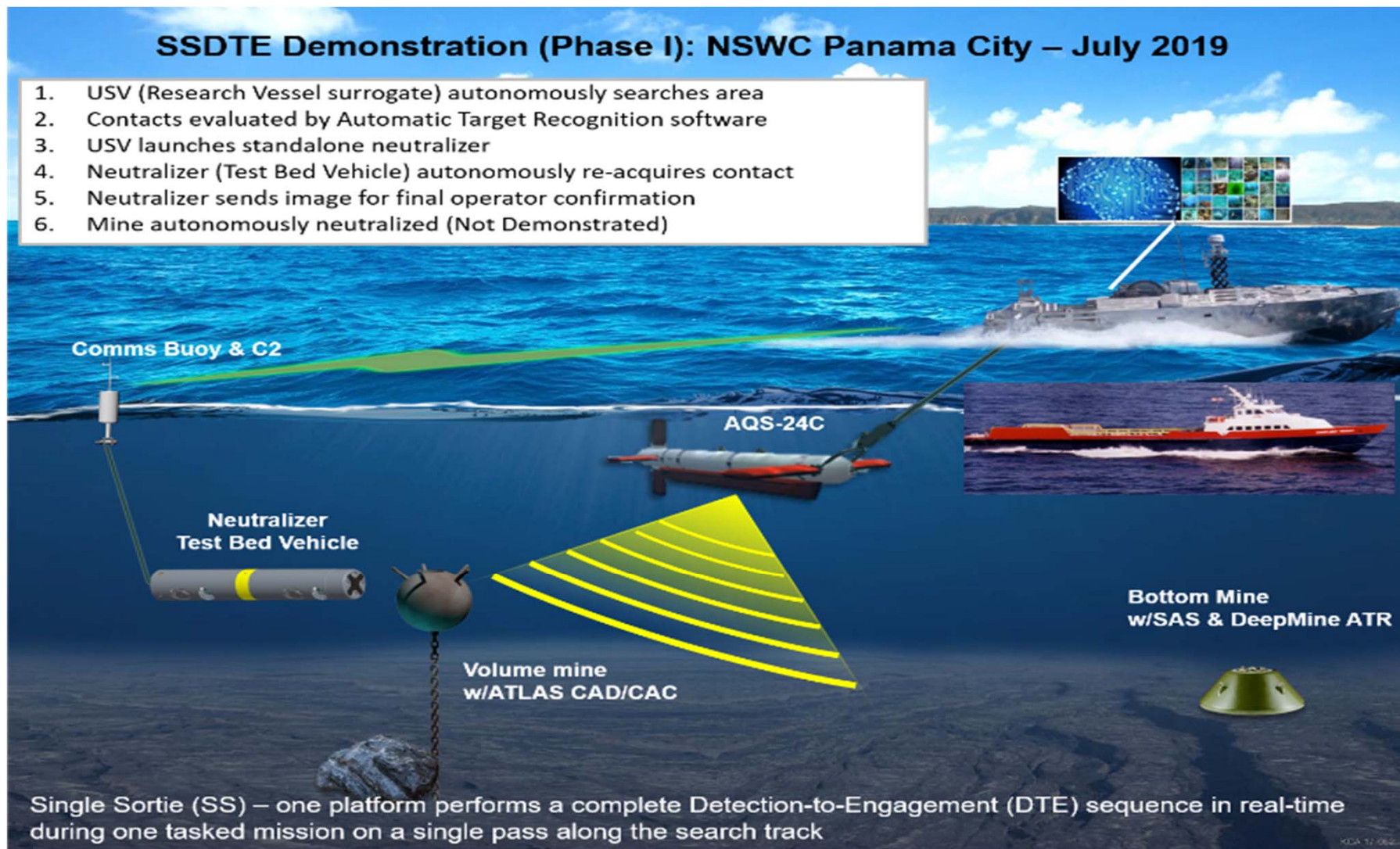


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# Single Sortie Detect to Engage

## SSDTE Demonstration (Phase I): NSWC Panama City – July 2019

1. USV (Research Vessel surrogate) autonomously searches area
2. Contacts evaluated by Automatic Target Recognition software
3. USV launches standalone neutralizer
4. Neutralizer (Test Bed Vehicle) autonomously re-acquires contact
5. Neutralizer sends image for final operator confirmation
6. Mine autonomously neutralized (Not Demonstrated)



Single Sortie (SS) – one platform performs a complete Detection-to-Engagement (DTE) sequence in real-time during one tasked mission on a single pass along the search track

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# AMCM LCS MP & VOO Systems Highlights



- **Coastal Battlefield Reconnaissance and Analysis System (COBRA) (AN-DVS-1) Block I**
  - Two COBRA systems delivered in 2019, six additional systems on contract for delivery in 2021/2022
  - Completed COBRA Block I -3A CT4 Flight Test at Eglin AFB to collect data in new environments against previously untested targets for insertion into the COBRA Algorithm Development Set
- **Airborne Laser Mine Detection System (ALMDS) (AN/AES-1)/ Airborne Mine Neutralization System–Archerfish (AMNS) (AN/ASQ-235)**
  - Provided on-site technical and tactical support during the following exercises in FY19:
    - Royal Fleet Auxiliary's *Mounts Bay* and ESB Vessel of Opportunities (VOO)
    - BALTOPS
    - HSC-21 Unit Level Training
    - HSC-28 Unit Level Training (Savage Ice)
  - Planned FY20 exercises:
    - HSC-28 MIW HARP Assessment participation (Norfolk / Key West) – 2QFY20.
    - HSC-28 BALTOPS with MK 64s (live) – 3QFY20.
    - HSC-21 RIMPAC with MK 64s (live) – 4QFY20



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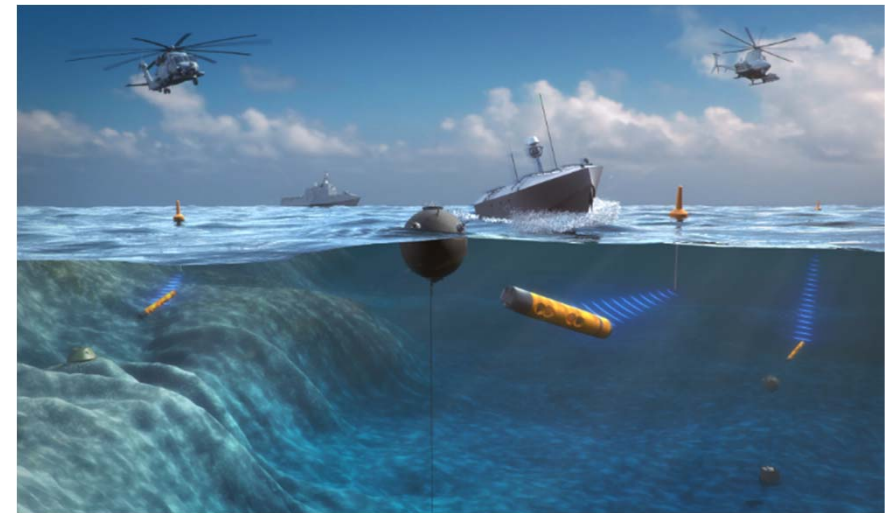


# Barracuda Program Highlights



Barracuda provides a low-cost mine clearance capability in an A-size sonobuoy diameter form factor for near surface mine neutralization.

- Mission: Provide rapid reacquisition, identification, and neutralization capability against near surface sea mines
- Employment: Semi-autonomous capability launched from the MCM USV and hosted by LCS MCM MP or other platforms of opportunity.



## Barracuda, Major Subassemblies for Assembly Operations



### Program Status

- Milestone B and Contract Award to Raytheon- April 2018
- SRR/SFR and PDR conducted in FY19
- Currently commencing Detail Design of Neutralizer Vehicle

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# Maritime Mining



Quickstrike Joint Direct Attack Munition (JDAM)



Quickstrike Extended Range (ER)



MK 62



MK 63



MK 65

Quickstrike



Hammerhead

- Sensor Module
  - Communication Module
  - Capsule Module
  - Command, Control, Signal Processing, and Decision Module
  - Energy Module
  - Mooring Module
- \* Notional representation



Clandestine Delivered Mine (CDM) MK 68



Submarine Launched Mobile Mine (SLMM) MK 67

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# Mines Highlights



- **Quickstrike MK 62/MK63/MK65**
  - Continued development of Safe and Arm Device MK 75 with Sechan Electronics
- **Quickstrike Joint Direct Attack Munition (JDAM)/Quickstrike Extended Range (ER)**
  - Aerial Delivery Improvement: increased standoff, precision safety
  - Operational Demonstration #2 conducted 3QFY19
- **Clandestine Delivered Mine (CDM)**
  - Conducting prototype testing
  - Qualification testing to be completed in FY20
  - Initial delivery by end of FY20
- **Hammerhead**
  - New Program-started in 2018
  - Prepositioned, encapsulated torpedo
  - Modular architecture approach to allow for future technology insertions
  - Request For Information released in December 2019
  - Release of Prototyping Proposal planned in FY20



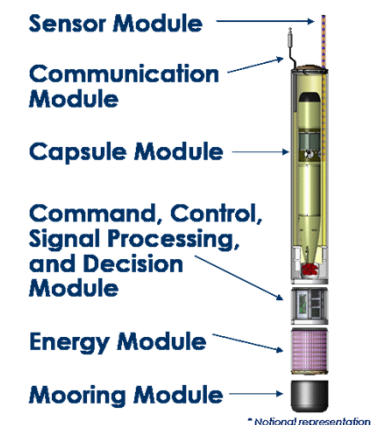
Valiant Shield '18



Quickstrike ER



Clandestine Delivered Mine (CDM)



Hammerhead

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# QUESTIONS?

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