



# **UNDERSEA WARFARE (USW) ELECTROMAGNETIC SYSTEMS DEPARTMENT**

## **CODE 34 OVERVIEW**



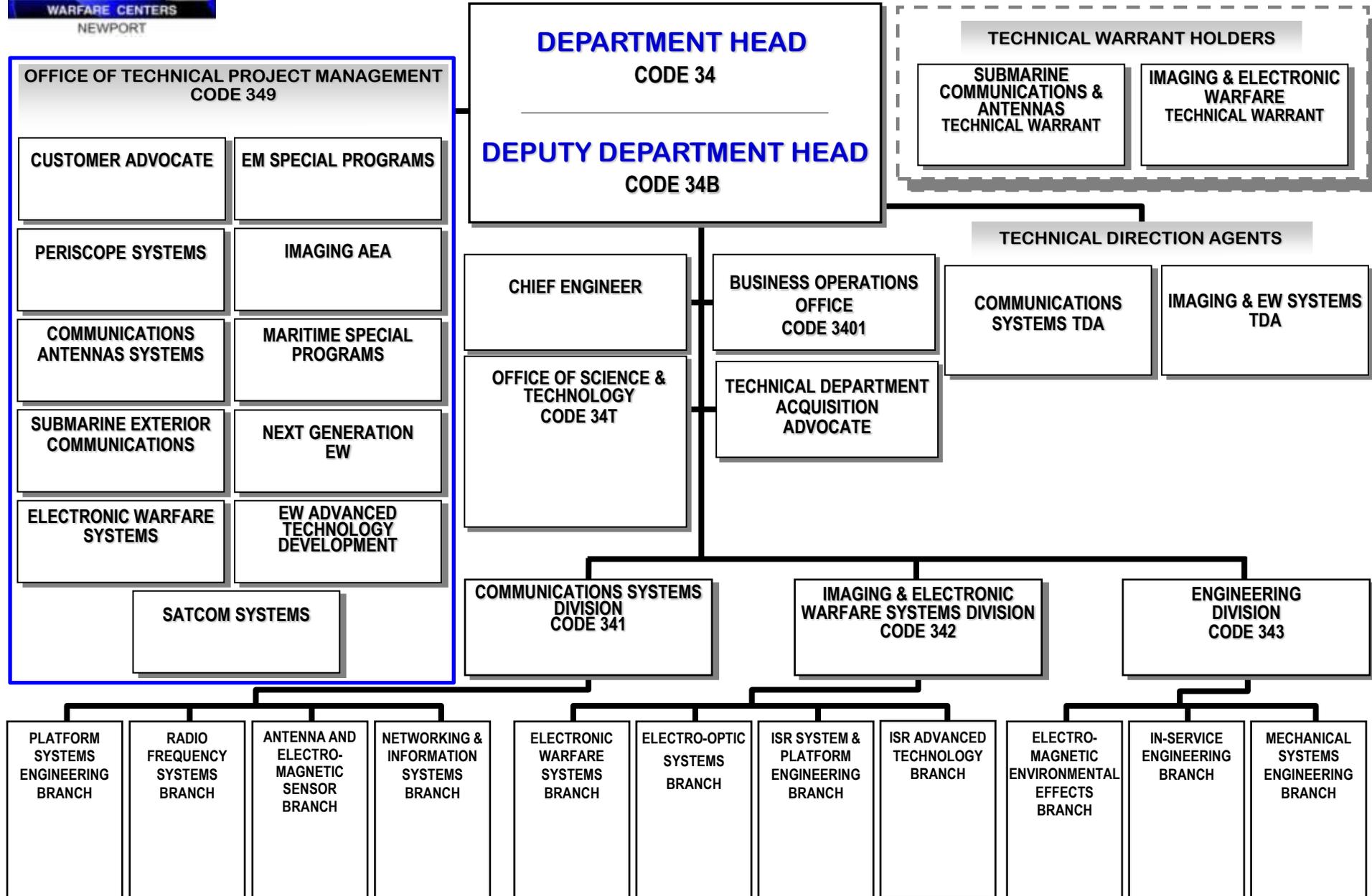
**October 2015**

**UNCLASSIFIED**





# USW Electromagnetic Systems Department



(A) = Acting  
(D) = Deputy

UNCLASSIFIED

Naval Undersea Warfare Center Division, Newport  
1176 Howell St Bldg 1319, Newport, RI 02841-1708

# USW Electromagnetic Systems Department Product Areas

## IMAGING



- Integrated Submarine Imaging System (ISIS)
- Photonics Mast
- SUBIS Imaging
- Type 8 Mod 4 IR
- In-Service Periscopes
- National Maintenance
- Panoramic Periscope
- PATRIOT
- TOPGATE
- Imaging Sensor Development (ONI)

## COMMUNICATIONS

- Submarine Comms TDA
- Submarine Radio Room Integration & Test
- Submarine SATCOM
- Internet Protocol Transition
- Submarine Comms Technology
- USW FORCENet
- Electromagnetic Compatibility
- Advanced Submarine Sail
- C4ISR Systems Engineering
- UUV Communications
- Undersea Constellation
- Virtual Submarine



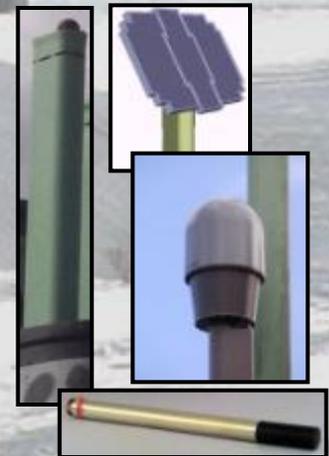
## ELECTRONIC WARFARE



- AN/BLQ-10 ESM
- ISCRS/ICADF
- Type 18I Antenna
- Surveillance Sensors
- In-Service ESM
- Signature Reduction
- Periscope Automatic Direction Finder
- Early Warning Receivers
- UUV Sensors
- Information Warfare
- End-to-End Assessments

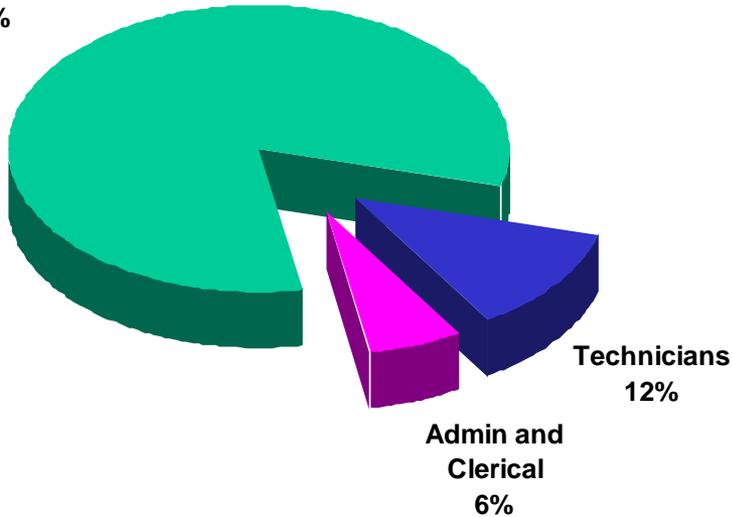
## ANTENNAS

- Multifunction Mast (OE-538)
- SubHDR (OE-562A)
- Navy Protected (EHF) and Wideband (X & GBS) MILSATCOM
- Navy EHF Satellite Program (NESP)
- Submarine Antennas
- Submarine Antenna Technology
- Comms at Speed & Depth
- Off-Board Sensors



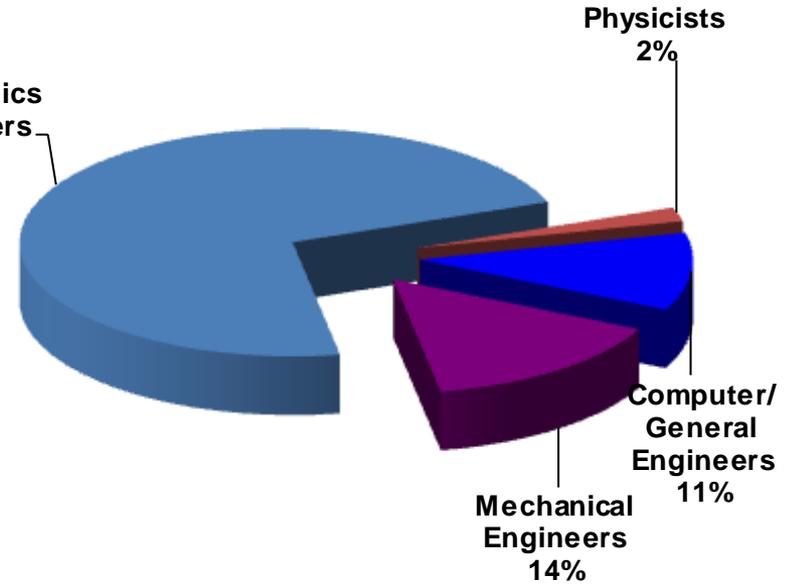
# USW Electromagnetic Systems Department Our People

Scientists and  
Engineers  
82%



**Total - 298**

Electronics  
Engineers  
73%



**Scientists & Engineers - 245**



## CODE 34 ADVANCED DEGREES

11 - PhDs

85 - Masters Degrees

# USW Electromagnetic Systems Department Major Facilities

**Overwater Arch**



**New Electromagnetic Sensor Facility**



**Fishers Island**

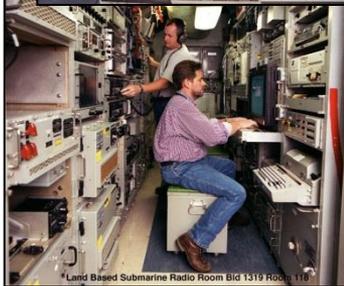


**Building 1319**



Compact Range B 1319 1st F.O.C. North County 9230-122

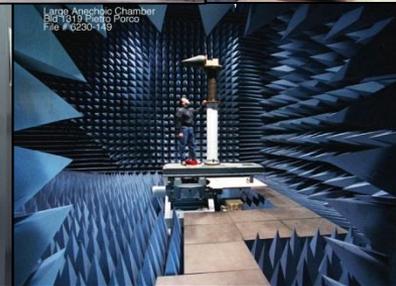
File # 6230-66 Bid 1319 Room 222 Virtual Test Facility



\*Land Based Submarine Radio Room Bid 1319 Room 119



6230\_64



Large Anechoic Chamber Bid 1319 North Porco File # 6230-119



# Periscopes & Imaging



## Photonics (PMP/PMV)

- Non-hull penetrating periscope used on Virginia and SSGN Class submarines
- Color Camera
- Black and White (HDTV) Camera
- Mission Critical Color Camera
- Forward Looking Infrared (FLIR) Camera
- Eyesafe Laser Range Finder (ELFR)
- ESM/Antenna Assembly
- Radar Absorbing Structure (RAS)

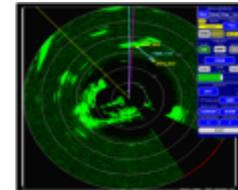
## Integrated Submarine Imaging System (ISIS)

- Next generation hull-penetrating electro-optical system for SSGN, LOS ANGELES, and SEAWOLF-Class submarines
- Fully-integrated Type 18 and Type 8 periscopes, control, display, range-finding, infra-red, and enhanced ESM capabilities
- Integrated design and spiral acquisition enabling platform commonality, reduced acquisition cycle time, and reduced ownership cost



## Type 18

- Surveillance periscope, one of two primary "hull-penetrating" periscopes in the fleet, used on all LOS ANGELES and SEAWOLF-Class submarines
- Precision optical and Signal intercept capability
- Highly-versatile multi-use sensor system



Photonics

## Night OWL Technology Development

- Infra-red imaging capability from the Type 8 Periscope for increased situational awareness during day and night operations

## MAJOR SPONSORS:

- NAVSEA PMS435, PMS450
- COMSUBLANT
- ONR
- ONI

## ROLES:

- TDA, ISEA, AEA
- National Maintenance

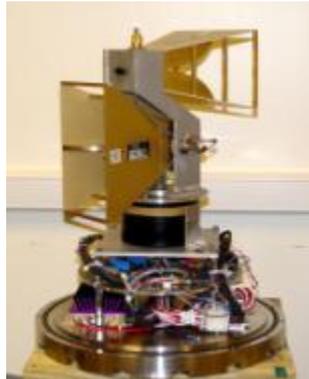
## Type 8 Mod 3

- Upgraded with LDR SATCOM sensor
- Currently in use on TRIDENT, LOS ANGELES, and SEAWOLF-Class submarines

# Electronic Warfare

## Sensors

- AN/BVS-1 Sensor
- 18I Antenna
- Mission Configurable Antennas
- Information Operations Sensors
- SRTD Sensor
- Integrated ESM Mast (IEM)
- Multi-Function, Modular Mast
- RCS/EO/IR Signature Reduction



## Advanced Development

- Stealth Materials and Treatments
- Imaging Enhancements
- Off-Board Sensors
- Imbedded Radar Vulnerability and Mission Planning Tools
- Technology Insertion



## MAJOR SPONSORS:

- NAVSEA PMS435, PMS450, PMS392
- NIOC (CNSG)
- ONI
- NRO
- OGA
- SLC
- NRL
- SPAWAR
- NSA

## ROLES:

- TDA, ISEA, AEA
- DA (PEPI-3/EWR)
- Systems Engineering
- Systems Integration
- Platform Integration

## Systems

- AN/BLQ-10 (V) *including Next Generation*
- CADF/ICADF
- CLUSTER SNOOP
- Classic Troll
- AN/WLR-8, HPI
- Direction Finding/ADF Upgrade
- Early Warning Receivers
- ASDS ES
- SIGINT Receivers



# Submarine Communications



## SUB HDR Antenna

- Supports IP Transition

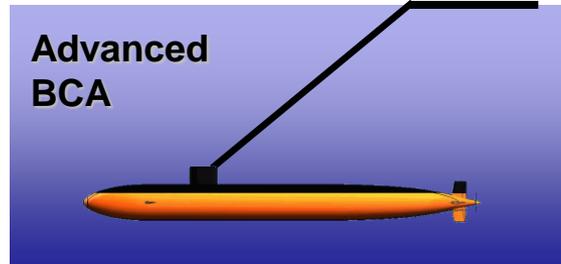


## Buoys

- BRT-6
- Sub EPIRB



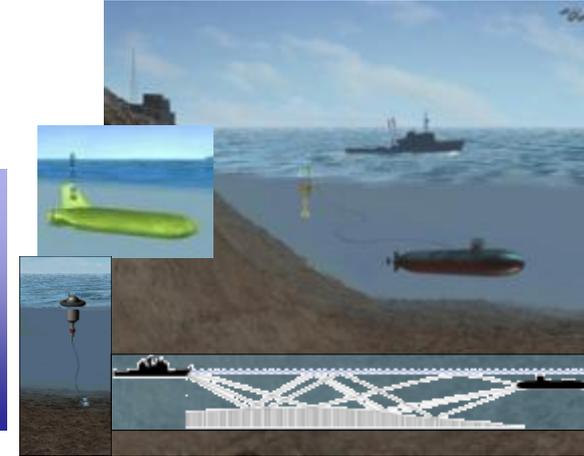
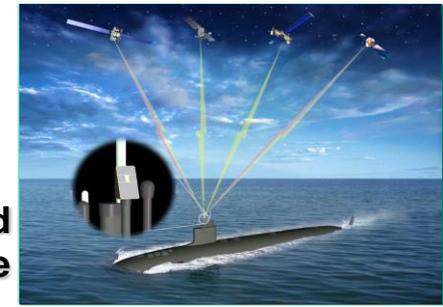
## Advanced BCA



## OE 538 Antenna

- UHF Asynchronous Comms
- Worldwide IP Comms
- Improved UHF

## Integrated Topside



## Comms at Speed & Depth

### MAJOR SPONSORS:

- SPAWAR PMW 170, 770
- NAVSEA PMS395
- ONR
- ONI
- OGA

### ROLES:

- TDA, ISEA, AEA
- Systems Engineer
- Systems Integration
- National Maintenance



**SCSS &  
Common Submarine Radio Room**



**Navy Protected (EHF) and  
Wideband (X & GBS)  
MILSATCOM**

