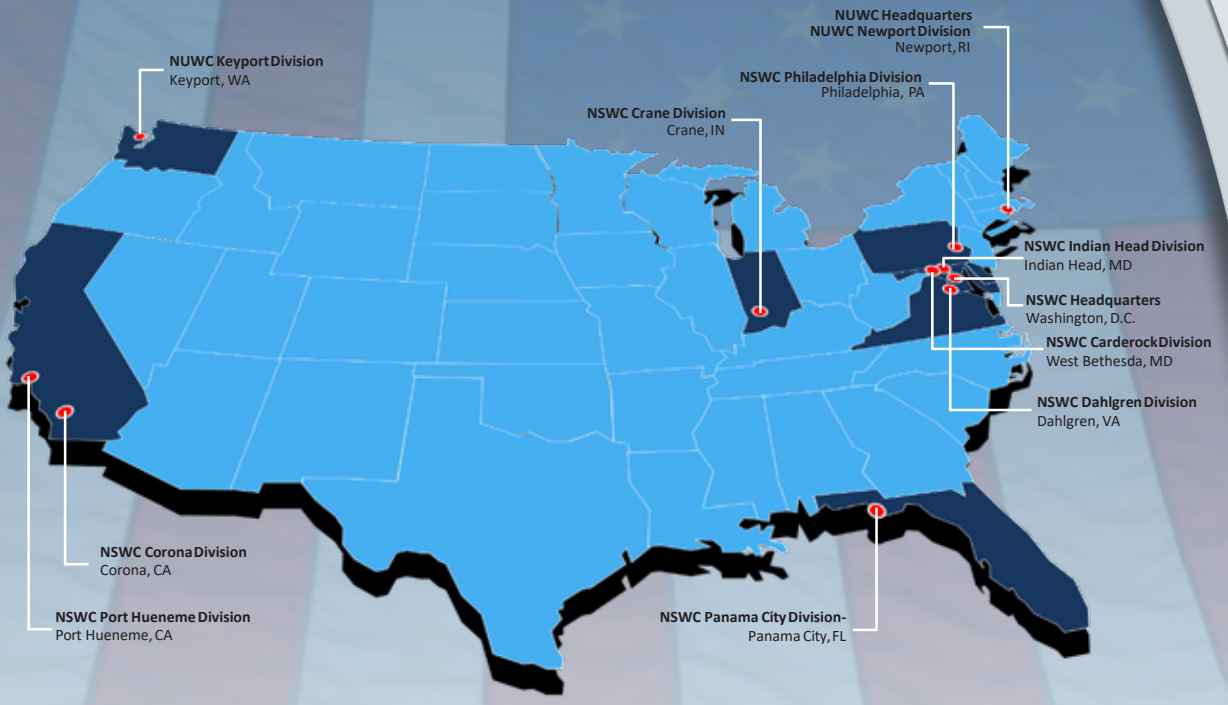
NAVAL SEA SYSTEMS COMMAND

WARFARE CENTERS

NAVAL SURFACE WARFARE CENTER | NAVAL UNDERSEA WARFARE CENTER

10 Divisions – One Team



Roles of the Warfare Centers

- Make naval technical programs successful
- Provide a bridge between the technical community and the warfighter
- Determine and develop capabilities for the fleet
- Verify the quality, safety, and effectiveness of platforms and systems
- Design, develop, and field solutions for urgent operational fleet needs

PROGRAMS

8,779
Ship/Submarine Modernizations/ Tech Insertions

145
Technical Capabilities

18,672
Depot Refurbs/ IMA Repairs

164+
Unique RDT&E Facilities

106,655
Technical/ Logistic Hotline Call Responses

1,709
Fleet Fly-Away Teams Dispatched

$6.7B
Contracted Annually

443
Customers

PERSONNEL

15,698
Scientists & Engineers *representing*

52% *of the* Navy's Scientific & Engineering Expertise

6,821
Masters Degrees

897
PhDs

134
Patents Filed

NAVAL SEA SYSTEMS COMMAND

WARFARE CENTERS

NAVAL SURFACE WARFARE CENTER | NAVAL UNDERSEA WARFARE CENTER

Innovate for the Fleet after Next | **Build an Affordable Fleet for Tomorrow** | **Sustain the Fleet of Today**

TRL 1-2 Concept to Application | TRL 3-4 Analysis, Testing, Prototyping | TRL 5 Operational Demo | TRL 6-7 Included in POR, industry transition | TRL 7-8 Acquisition and Fielding | TRL 9 Capability Delivered to Warfighter

Basic Research | Applied Research | Rapid Prototyping | Operational Testing | Technical Risk Assessments | Production Engineering and Support | Install: Modernization & Alterations | Technology/ Obsolescence Management

- Early ideation fueled by naval R&D priorities
- Project funding transitioned to sponsor
- Patents
- Technology transfer

- First tested in LOE or developmental / operational experiment
- New or enhanced capability demonstrated
- Leave behind capability following operational demo

- Industry incorporates innovation
- Sponsor invests in R&D for rapid prototyping and fleet demonstration
- Included in an acquisition program in the FYDP

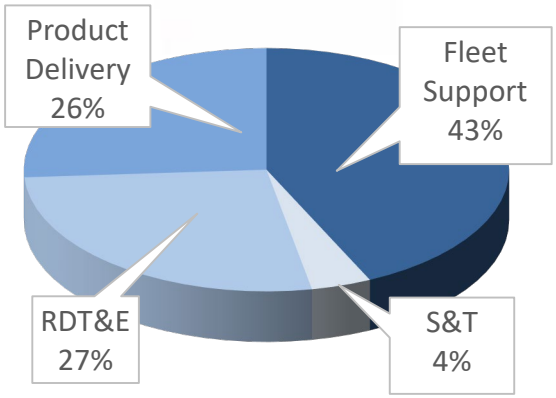
- Tests at major ranges/Land Based Testing facilities
- Live, Virtual, and Constructive training & experimentation
- System engineering
- Integrated logistics support

- ISEA fly-away teams sustain fleet operations
- Manage depots and facilities/IMA repairs
- Technology refresh
- Tech assists/ distance support

Delivering Readiness, Capability, and Capacity

- Warfare Centers play an important, value added role as a member of the acquisition team
- Warfare Centers' life cycle engineering capabilities help ensure safe, affordable and effective products are delivered to the warfighter
- Warfare Centers have a disciplined process for accepting and assigning the right work to the right site based on technical capabilities; and for sizing the workforce to the funded workload
- Warfare Centers continually shape the workforce size, workforce talents, and facilities to meet long-term strategic needs
- Warfare Centers are determined to standardize processes and procedures to become more efficient, structured, and transparent
- Warfare Centers advance cybersecurity, improve virtual infrastructure, and obtain the necessary tools to support the Navy's digital transformation
- Warfare Centers initiate and leverage partnerships with other government activities, industry, and academia to foster a collaborative culture

FY22 Reimbursable Funding



Warfare Centers Leadership

Dr. Martin Irvine, Jr., SES
Executive Director

CAPT Thomas J. Dickinson, USN
Commander

NSWC CARDEROCK DIVISION

NAVAL SEA SYSTEMS COMMAND

WARFARE CENTERS

2022 Highlights

Atlantic Thunder 22 Support: Supported U.S. 6th Fleet and Combined Task Force 65 in conducting the multinational Atlantic Thunder 2022 SINKEX. Led Battle Damage Assessment efforts, conducted stability and weapons effects modeling and simulation, developed and deployed a novel satellite-based hull monitoring system for SINKEX data collection, and collected 3D data at sea using USMC Unmanned Aerial System (UAS). Prior to the SINKEX, provided technical support to MDSU2, FDRMC Rota, SUPSALV, SALMO, and others to conduct Battle Damage and Repair Exercises.

T-AGOS Hydrodynamic Hull Tests Influence Design: Culminated five years of design effort and two years of hydrodynamic testing, completing the first government-led contract design of a Naval Auxiliary over 20 years. The T-AGOS (25) Ship Design and System Specification utilized Carderock expertise in model-scale seakeeping and structural loads experiments performed in the Maneuvering and Seakeeping (MASK) facility, resistance and powering testing in the David Taylor Model Basin, propeller cavitation performance in the Large Cavitation Channel, fluid and hull hydrodynamic modeling, structural design and ship design management.

Multiple Signature Measurements Conducted on Fleet Assets: Conducted a wide variety of signatures related tests on multiple fleet assets. Underwater electromagnetic signatures measurement and onboard control systems calibration trials were done on USS SOUTH DAKOTA (SSN 790). The first of an initial battery of Radar Cross Section (RCS) signature measurements on USS ZUMWALT (DDG-1000) were conducted in California. And on the East Coast, lifecycle RCS signature measurements of USS PAUL IGNATIUS (DDG-117) were conducted in Virginia.

NSWC CARDEROCK DIVISION

NAVAL SEA SYSTEMS COMMAND

WARFARE CENTERS

Naval Surface Warfare Center (NSWC) Carderock Division is the Navy's center of excellence for ships and ship systems. For over 100 years, NSWC Carderock Division has helped preserve and enhance the nation's presence on and under the seas. NSWC Carderock Division is the full-spectrum research and development, test and evaluation, engineering, and fleet support organization for the Navy's ships, submarines, military watercraft, and unmanned vehicles with insight into new concepts and diverse technologies for the Navy fleet of the 21st Century. NSWC Carderock Division's expertise spans from naval architecture and marine engineering, to electrical and mechanical engineering, to computer engineering and physics.

NSWC Carderock Division specializes in ship design and integration; environmental quality systems; hull forms and propulsors; structures and materials; signatures, silencing systems, and susceptibility; and vulnerability and survivability systems.

NSWC Carderock Division's unique laboratories, modeling and simulation facilities, at-sea-assets, and large-scale, land-based engineering and test sites at our headquarters in West Bethesda, Maryland, and seven detachment locations across the country contribute to the full-spectrum nature of our mission.

Navy and maritime communities have come to depend on our expertise and innovative spirit in developing advanced platforms and systems, enhancing naval performance, integrating new technologies, and reducing operating costs.

NSWC Carderock Division will continue to solve challenging engineering problems to meet future fleet needs.

Mission

To provide full-spectrum research and development, test and evaluation, analyses, acquisition, and fleet support for the Navy's ships, ship systems, and associated Navy logistics systems. Specific emphasis is to provide the core technical capabilities required for the integration of surface and undersea vehicles and associated systems, to develop and apply science and technology associated with naval architecture and marine engineering, and to provide support to the maritime industry.

Vision

To be the Navy's trusted partner for identifying and providing world-class, innovative, and cost-effective solutions for advanced ship and ship systems, for providing technical solutions to the warfighter, and to keep our fleet at sea.

Thrust Areas

- Ship, Submarine, and Unmanned Vehicle Design and Integrity
- Advanced Manufacturing
- Digital Strategy
- Signature Management
- Unmanned Mobility Systems

Technical Capabilities

- Ship and Submarine Design and Integration
- Ship and Submarine Acquisition Engineering
- Ship and Submarine Concepts, Analyses of Alternatives, and Design Tool Development
- Combatant Craft and Expeditionary Vehicles
- Unmanned and Maritime Intelligent Autonomous Systems
- Hull Forms and Fluid Dynamics
- Propulsors
- Surface, Undersea, and Weapon Vehicle Materials and Manufacturing Technology
- Surface and Undersea Vehicle Structures
- Alternative Energy and Power Sources Research & Development
- Surface, Undersea and Expeditionary Vehicle Vulnerability Reduction and Protection
- Surface and Undersea Vehicle Acoustic Signatures, Silencing Systems, and Susceptibility
- Surface and Undersea Vehicle Non-Acoustic Topside Signatures, Silencing Systems, and Susceptibility
- Ship Environmental Treatment Systems, Management, and Safety
- Surface and Undersea Vehicle Underwater Electromagnetic Signatures, Signature Mitigation Systems, and Susceptibility
- Fleet Signatures Systems
- Advanced Fabrication of Scaled Pressure Hulls and Scaled Models

Major Facilities

- David Taylor Model Basin — West Bethesda, MD
- Maneuvering and Seakeeping Facility (MASK) — West Bethesda, MD
- Deep Submergence Pressure Tank — West Bethesda, MD
- Anechoic Flow Facility — West Bethesda, MD
- Structure Evaluation Laboratory — West Bethesda, MD
- Explosives Test Pond — West Bethesda, MD
- Ship Materials Technology Center — West Bethesda, MD
- Magnetic Fields Laboratory — West Bethesda, MD
- Acoustic Research Detachment — Bayview, ID
- Large Cavitation Channel — Memphis, TN
- Southeast Alaska Acoustic Measurement Facility (SEAFAC) — Ketchikan, AK
- South Florida Ocean Measurement Facility (SFOMF) — Fort Lauderale, FL

Workforce Profile - 2022

- Total: 2,814
- Scientists & Engineers: 2,014

Advanced Degrees - 2022

- Ph.Ds – 194
- Masters - 803

Total Annual Funded Program - 2022

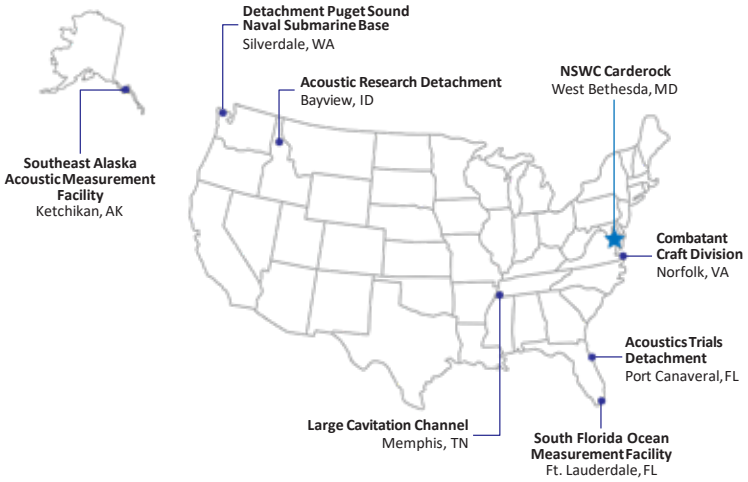
- $1.1 billion
- Contracts issued: $1 billion

Carderock Division Leadership

Lawrence Tarasek, SES
Technical Director

CAPT Matthew Tardy
Commanding Officer

Carderock Division Sites



NSWC CORONA DIVISION

NAVAL SEA SYSTEMS COMMAND

WARFARE CENTERS

2022 Highlights

Warfighting System Performance Data Accessibility: Successfully developed and demonstrated a use case for Enterprise Performance Integrated Capability (EPIC), a comprehensive data architectural solution that addresses the challenge of having disparate performance data across various Navy, Marine Corps and Coast Guard systems. EPIC leverages the latest in digital systems engineering and data science techniques to optimize data analytics, data management, and performance assessment enabling fleet-wide transparency, secure accessibility, and business intelligence, providing insight into systems, systems or systems, and family of systems performance.

Surface Ship System Material Readiness: Provided authoritative material readiness models, data, and analytic studies in support NAVPLAN Readiness Objectives R3 initiative to enable ships to achieve 90-days of endurance, P2P Surface initiative to achieve sufficient ships ready for tasking, and COMPACFLT onboard part sparing optimization. Collaborated with Center for Naval Analysis and Institute for Defense Analysis to develop predictive models utilizing Material Readiness Database (MRDB) data and developing data flows from MRDB into the Jupiter analytics environment.

High Energy Laser (HEL) Measurement Advancement: Validated the measurement of HEL power to 142kW with an uncertainty of less than 2 percent using the Radiation Pressure Power Meter jointly developed with the National Institute of Standards and Technology. Developed prediction models for atmospheric turbulent effects on beam profiling in collaboration with Office of Naval Research. Accurate HEL power measurements directly contribute to the Navy's ability to deliver non-kinetic lethal and non-lethal effects on maritime, air, space, and shore-based targets.

NSWC CORONA DIVISION

NAVAL SEA SYSTEMS COMMAND

WARFARE CENTERS

NSWC Corona Division has served as the Navy's independent assessment agent since1964. With experience in gauging the Navy's warfighting capability, NSWC Corona is a leader in NAVSEA data analytics. Utilizing networked data environments, data analytics and visualization, and measurement technology to bridge the Navy's data silos, Corona enables informed decision-making for the warfighter. With more than 3,800 engineers, scientists, and support personnel, Sailors, and contractors, NSWC Corona is located in Norco, California, with detachments in Fallbrook and Seal Beach and personnel in 14 additional locations.

Readiness Assessment

Corona Division manages programs to provide the Fleet and Shore community with transparency into the material readiness of critical weapon, combat, C41, and HM&E systems and the factors that are driving material readiness. Corona provides reliability, maintainability, and availability (RM&A) metrics for over 600 systems and 2800 variants (C5I and HM&E on surface ships and submarines) delivering automated & predictive analytics. Products and services have broad utilization across Navy Program offices, In Service Engineering Agents, Regional Maintenance Centers, OPNAV, and the Fleet. The Readiness Assessment capabilities and products are evolving to address the Navy's increasing expectations for improved transparency into readiness, cost, and Fleet maintenance/modernization processes.

Performance Assessment

Corona Division has its technical roots in conducting analytical data-driven performance assessments on offensive and defensive systems of the surface Navy supporting acquisition T&E and Fleet exercise feedback. Capabilities span across data, rigor, systems, and collaborations in order to facilitate comprehensive assessments in a timely manner. Corona executes best practices in data requirement documentation to assure the right data is available to answer the critical questions. Corona maintains collaboration spaces equipped to receive large volumes of data and the ability to store, process, analyze, and report out results in a classified environment. Corona has implemented automation and adopted visualization software to streamline the delivery of robust event reconstruction with embedded communication, video streams, and ground truth in a short amount of time (a handful of hours for Fleet Operational Training exercises, forexample).

Range Systems Engineering

Corona Division provides Naval surface and air range systems engineering and technology solutions for Naval and Joint training and testing, engineering, integrating, and installing instrumentation on test and training ranges, including shipboard systems and remote range areas. Corona operates and maintains Fleet tactical training ranges and network environment and is the Fleet's technical engineering agent for the Fleet training live, virtual, and constructive (LVC) capability. Corona ensures that existing and future range systems meet the Fleet's demand for combat realism, live mission monitoring and replay, and information and data collection for analysis and assessment.

Measurement Science and Engineering

Corona Division is designated as the Navy's Test and Monitoring Systems technical advisor responsible for disseminating calibration guidance to over 2,750 personnel across the Navy enterprise, and ensuring accurate and traceable measurements to international standards to reduce the risk of wrong test decisions and improve Fleet lethality. Corona authors the detailed calibration procedures used to perform nearly 500,000 calibrations each year on the Navy's more than 1.6 million pieces of test equipment; and uses the results from these calibrations to establish and optimize calibration periodicities to ensure the proper risk vs. cost trade-off. Corona operates the Gage and Standards Laboratory, serving as the technical authority for NAVSEA combat systems special interface gage requirements. Corona also conducts strategic systems testing and analysis, and surveillance assessment for Trident Reentry Systems Mk4, Mk4A, and Mk5.

Quality and Mission Assurance Assessment

Corona Division provides quality and mission assurance for Strategic and Missile Defense systems that have a very low tolerance for failure or problem systems where the program manager requests focused support. Corona develops and tailors Quality and Mission Assurance (Q&MA) requirements which outline program office expectations for management and customer involvement in key technical processes during acquisition and sustainment such as system engineering, test, configuration control, reliability, manufacturing. In addition, Corona provides training to the contractor and government community on Q&MA requirements, conducts assessments, and provides on-site technical experts to determine and improve the effectiveness of the Q&MA activities and rigor.

Ground Combat Weapons and Ammunition Test, Evaluation, and Assessment

Corona provides ground ammunition and weapons engineering expertise to the USMC and ammunition community. Working directly with the acquisition community and warfighter, Corona supports fleet logistics, combat operations, and training by providing cradle to grave research and development, test and evaluation, lifecycle engineering, and acquisition expertise.

Mission

Provide transparency to warfighting readiness through data analytics and assessment, engineering the Fleet's Live-Virtual-Constructive training environment, and assuring the accuracy of measurements.

Vision

Optimize decision-making for warfighting and fleet readiness.

Technical Capabilities

- Weapon Systems Performance Assessment
- Quality and Mission Assurance Assessment
- Metrology, Test, and Monitoring Systems Assessment
- Naval Surface & Air Range Systems Engineering
- Weapons Systems Interface Assessment
- Naval Systems Material Readiness Assessment
- Strategic Systems Testing and Analysis, and Surveillance Assessment
- Ground Combat Weapons and Ammunition Test, Evaluation, and Assessment

Major Facilities

- Joint Warfare Assessment Lab
- Measurement Science and Technology Lab
- Daugherty Memorial Assessment Center
- Weapons Surveillance and Test Lab

Workforce Profile - 2022

- Total: 1,944
- Scientists & Engineers: 1,288

Advanced Degrees - 2022

- Ph.Ds – 33
- Masters - 463

Total Annual Funded Program - 2022

- $800 million
- Contracts issued: $400 million

Corona Division Leadership

Dianne Costlow, SES
Technical Director

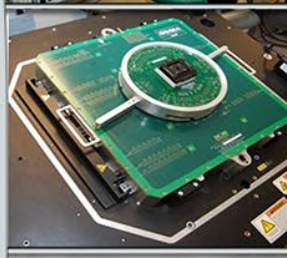
Captain Michael P. Aiena, USN
Commanding Officer

Corona Division Sites

NSWC CRANE DIVISION

NAVAL SEA SYSTEMS COMMAND

WARFARE CENTERS



2022 Highlights

Underwater Launch Test Capability: Crane has been given the requirement from the program office to provide operations, execute site activation, test, evaluate, and sustain the Underwater Launch Test Capability (ULTC) program. The overall ULTC function will allow for developmental and qualification testing to provide data verifying the system's ability to achieve eject performance as well as to analyze underwater hydrodynamic effects. Full operations of the ULTC must begin in FY26 to meet program milestones.

Silent Swarm 2022: Hosted Silent Swarm 22 at the National All-Domain Warfighting Center in Michigan. The event brought together over 150 participants from multiple DoD, industry, and academic organizations focused on experimentation with Electromagnetic Warfare capabilities employed on small multi-domain unmanned systems. More than 17 technologies in electromagnetic spectrum-related capabilities were employed on small unmanned systems. The different technologies were assigned to cooperative teams that worked on competing goals in order to discover the effectiveness of overcoming simulated military obstacles.

Submarine Battery Evaluation Center (SUBBEC): Held a ribbon cutting ceremony for the SUBBEC in 2022. This unique test capability does not exist anywhere else in the world. For the first time ever, the Submarine Main Storage Battery In Service Engineering Agent (ISEA) will have the capability of testing a full sized representative submarine battery. This test facility will provide full scale submarine battery and energy storage testing & modeling capabilities unique to the Navy, and will drastically improve the Navy's ability to predict, control, and mitigate low capacity batteries. Further, the test center could be used to test other battery types for the Navy in the future as it is configured to support future testing of emerging energy storage technologies. This unique test capability will allow for increased understanding of failure trend analysis and help extend the life of the battery.

NSWC CRANE DIVISION

NAVAL SEA SYSTEMS COMMAND

WARFARE CENTERS

Located on the third largest naval installation in the world, NSWC Crane Division's total focus is to support the warfighter by leveraging its technical capabilities for the rapidly changing combat environment. Anchored by technical expertise, a strong work ethic and total lifecycle leadership, NSWC Crane Division's personnel and preeminent facilities set the standard for excellence in acquisition, engineering and sustainment.

NSWC Crane Division's electronic warfare (EW) mission area provides innovative, leading-edge, technical solutions for military actions that use electromagnetic energy to control the electromagnetic spectrum. This includes destroying an adversary's combat capability, gathering intelligence data and ensuring friendly use of the electromagnetic spectrum. NSWC Crane Division's technical solutions are employed across air, ground, maritime domains for the joint and coalition forces. With more than one-half million square feet of offices and labs, NSWC Crane Division has a critical mass of co-located personnel and secured facilities to provide responsive, affordable, total lifecycle leadership. Several outdoor test ranges with encroachment protection, the most comprehensive mobile radio frequency (RF) threat simulators and multiple anechoic chambers are only some of the best-in-class resources available at Crane.

NSWC Crane Division's expeditionary warfare mission area is dedicated to providing the elite warfighter with reliable and practical solutions, expertly delivered and deployed to ensure safe and effective missions. NSWC Crane Division delivers specialized training and support for the advanced warrior, providing a decisive advantage in sensors and communications, power systems and interconnect technology, mobility and maneuverability, special munitions and weapons. NSWC Crane Division is known for rapid technology transition, integrating threat assessment, proven solutions and risk management with product deployment and training. Co-located personnel and facilities demonstrate NSWC Crane Division's commitment to total lifecycle leadership, offering a unique ability to accelerate response for the warfighter.

NSWC Crane Division's strategic missions experts are focused on innovative technical solutions to deter and defend against aggression and defeat threats worldwide. NSWC Crane Division's strategic missions experts and preeminent facilities provide high reliability electronics and sensors for successful global deterrence and ballistic missile defense. In fact, every ballistic missile in U.S. arsenal carries key components developed or supported by Crane. NSWC Crane Division is dedicated to innovative science, processes and policies that advance technologies such as printed circuit boards and trusted microelectronics. Experts are committed to developing and deploying the technology that ensures that weapons systems are fully reliable and always available to the warfighter.

Mission

Provide acquisition engineering, in-service engineering and technical support for sensors, electronics, electronic warfare and special warfare weapons. Apply component and system level product and industrial engineering to surface sensors, strategic systems, special warfare devices and electronic warfare/information operations systems. Execute other responsibilities as assigned by the Commander, Naval Surface Warfare Center.

Vision

Combating our nation's greatest threats, NSWC Crane Division is the indispensable mission expert, leveraging our deep technical heritage to deliver solutions through innovation and strategic partnerships.

Technical Capabilities

- Electronic Warfare Systems Research, Development, Test & Evaluation (RTD&E)
- Infrared Countermeasures and Pyrotechnic RDT&E and Life Cycle Support
- Strategic Systems Hardware
- Expeditionary Warfare and Systems
- Advanced Electronics RDT&E
- Sensors and Surveillance Systems Engineering, Integration, RDT&E Acquisition & Life Cycle Support
- Hypersonic Weapon Systems RDT&E
- Power and Energy Systems
- Electro-Optic and Infrared Technology
- Force Level Electromagnetic Warfare Mission Analysis, Advanced Concepts and Technologies

Major Facilities

- Rapid Innovation Prototyping Lab
- Special Weapons Assessment Facility
- Lake Glendora Underwater Test Facility
- Infrared Countermeasure Technology Complex
- Crane Artificial Intelligence Development Lab (CrAIDL)
- Spectrum Technology Advanced Research (STAR) Lab
- Anechoic chambers (3)
- Linear Accelerator Test Facility
- Strategic Weapons Systems Engineering and Evaluation Complex
- Electronic Warfare Systems Engineering Complex
- Electro-Optics Engineering and Test Facility
- Failure Analysis/Material Analysis Lab

Workforce Profile - 2022

- Total: 3,798
- Scientists & Engineers: 2,351

Advanced Degrees - 2022

- Ph.Ds – 144
- Masters - 721

Total Annual Funded Program - 2022

- $2 billion
- Contracts issued: $1.2 billion

Crane Division Leadership

Dr. Angela Lewis, SES
Technical Director

Captain Rex Boonyobhas,
USN Commanding Officer

Crane Division

NSWC DAHLGREN DIVISION

NAVAL SEA SYSTEMS COMMAND

WARFARE CENTERS

2022 Highlights

iLab IRIS-Aegis DPG Test Event: The FY22 iLab Innovation Project, IRIS-AEGIS Off-board Sensor Targeting, successfully demonstrated engaging a surface target with the AEGIS Combat System using an optically generated track. This effort was a cross-organization collaborative effort, with several departments and JMETC heavily engaged to make the project a success. Infrastructure to support future Live, Virtual, and Constructive (LVC) testing across Dahlgren was established between labs critical to future LVC testing needs. The team demonstrated the diverse network and T&E capabilities as part of the Dahlgren Proving Ground, the utilization of an enterprise cross domain solution, and the ability to rapidly tackle real tactical warfighter gaps and go from concept to test in just a few months. The project culminated in a live-fire test event, which was attended by VIPs from across DOD, industry, and academia, to demonstrate the capabilities and expertise present.

Gun Computer System (GCS) MK160: The Gun Computer System (GCS) MK160 team successfully conducted 18 different software builds, 6 Product Release Panels, 4 Product Certification Panels, 2 Element Certification Panels, and 1 Combat System Certification Panel in support of 24 tactical software deliveries to ships and land-based test sites. In addition, GCS MK 160 provided rapid capability design, development, and integration with MK 38 MOD 4 30mm Gun Weapon System (GWS). The MK 38 MOD 4 GWS Live Fire Event in July 2022 provided an end-to-end demonstration of the MK 38 MOD 4 GWS to include detection, tracking and engaging live surface and air targets with live ammunition against static and dynamic targets on the Potomac River Test Range (PRTR). PACFire was successful utilizing the MK 88 Mod 4 (30mm) Gun Mount and 0.50 cal Gun Mounts, MK 160 Fire Control System (FCS), MK 38 MOD 4 Gun console with Gunner's Yoke, and MK 48 MOD 2 Electro-Optical Sight Sensor (EOSS). During summer 2022, MK 160 embarked on a case study for the LCS program to integrate and characterize the CELsius Tech Radar and Optronic Site (CEROS). E30 made significant engineering contributions over a concentrated nine-month development period resulting in a successful two-week test and data collection, with live targets at PRTR using the SAAB CEROS system integrated through MK 160.

Real-Time Spectrum Operations (RTSO) Own Force Monitoring (OFM): The Spectrum Supportability Branch led efforts to support the permanent installation of the Real-Time Spectrum Operations (RTSO) Own Force Monitoring (OFM) system across the fleet. The RTSO OFM System is a Technical Innovation and a product of several Dahlgren Naval Innovative Science and Engineering (NISE) projects, which resulted in an initial prototype being installed on USS THEODORE ROOSEVELT (CVN 71) as a non-permanent change from November 2019 - July 2021, on USS CARL VINSON (CVN 70) as a non-permanent change from July 2021 - April 2022, and now on USS RONALD REAGAN (CVN 76) as a non-permanent change from August 2022 - May 2023. This initial RTSO OFM Prototype System will have supported two deployments onboard CVN 71, one deployment onboard CVN 70, and one deployment on CVN 76. The RTSO OFM System is fully qualified for shipboard installation with all required Environmental Qualification Testing being completed in FY22. The first 4 permanent RTSO OFM installations and System Operability Verification Tests of the system occurred in FY22. The RTSO OFM System consists of a Dahlgren developed RTSO OFM antenna with integrated GPS, Frequency Selective Limiter, Spectrum Sensor, and RTSO software. There are currently 8 more installations ongoing this FY, 29 scheduled installations in FY23, and 37 scheduled installations in FY24.

NSWC DAHLGREN DIVISION

NAVAL SEA SYSTEMS COMMAND

WARFARE CENTERS

NSWC Dahlgren Division is a shore command of the U.S. Navy under the Naval Sea Systems Command (NAVSEA), which engineers, builds and supports America's Fleet of ships and combat systems. NSWC Dahlgren Division has two primary sites – its headquarters at Dahlgren, Virginia and Dam Neck Activity in Virginia Beach, Virginia – as well as detachments and off-site locations across the United States.

NSWC Dahlgren Division provides science, technology, engineering and systems integration leadership and innovation that our nation's naval and joint forces rely upon for superior warfighting capability. NSWC Dahlgren Division works closely with the warfighter to fully understand operational challenges and requirements and provides the bridge to technology innovations and prototypes to develop capabilities with our private and industrial partners. This critical linkage results in delivery of effective, affordable and timely warfighting capabilities for our current fleet and the future fleet.

Mission

We deliver warfare systems to protect our nation and defeat our adversaries.

Vision

Design, develop, and integrate technologically superior, 21st century warfare systems.

Thrust Areas

Building on our core, target and prioritize technical opportunities in the following strategic thrusts:

- Lead electric weapons design, development and integration.
- Institutionalize mission engineering and analysis.
- Incorporate cyber warfare engineering in our naval systems.

Technical Capabilities

- Campaign, Mission, and Platform Level Surface Warfare Systems Analysis and Modeling
- Weapon Systems Analysis, Effects, and Effectiveness
- Radar and Electro-Optic Systems
- Surface Warfare Systems Engineering and Integration Research, Development, Test & Evaluation (RTD&E)
- Surface Combat Systems Engineering and Integration RDT&E
- Surface Combat Control Systems Science & Technology (S&T), RDT&E
- Surface and Expeditionary Conventional Weapon Control Systems RDT&E
- Surface Warfare System and Force Level Certification/ Independent Verification and Validation (IV&V)
- Human Systems Integration Science and Engineering
- Surface and Expeditionary Missile Systems Integration
- Conventional and Electromagnetic Gun Weapon Systems RDT&E
- Directed Energy Systems RDT&E
- Weapons Systems Integration for Surface, Air and Ground Unmanned Systems
- Expeditionary and Other Weaponry Systems RDT&E
- Strategic Mission Planning, Targeting, and Fire Control Systems
- Re-Entry Systems
- Surface Electronic Warfare Systems Architecture and Combat Systems Integrations RDT&E
- Surface and Expeditionary Warfare Systems Safety
- Surface Warfare Electromagnetic Environmental Effects
- Chemical, Biological, and Radiological Defense Systems
- Asymmetric Warfare Engineering and Embedded Systems
- Physical and Non Physical Vulnerability Analysis
- Integrated Surface Combat Control Systems Support
- Integrated Training Systems
- Integrated Topside Design (ITD)
- Surface Combat Computing Systems S&T, RDT&E
- Surface Warfare Threat Engineering
- Mission Engineering
- Hypersonic Weapons Systems Integration and RDT&E

Major Facilities

- Advanced Spatial Technology Research Analysis Lab
- Asymmetric Technology Innovation Lab
- Bateman Chemical, Biological and Radiological Warfare Lab
- Electromagnetic Environmental Effects Facilities
- Electromagnetic Railgun Launch Facility
- Explosive Experimental Area
- Force Integration and Interoperability Lab
- Human System Integration Lab
- Information and Special Warfare Systems Lab
- Integrated Combat Control Systems Lab
- Integrated Training Capabilities Lab
- Integrated Warfare Systems Lab
- Maginot Open Air Test Site
- Naval Directed Energy Warfare Lab
- Open Architecture Computing Facility
- Platform Integration Lab
- Potomac River Test Range
- Search and Track Sensor Test Site
- Submarine-Launched Ballistic Missile Lab
- Surface Sensor and Combat Systems Facility

Workforce Profile - 2022

- Total: 4,974
- Scientists & Engineers: 3,695

Advanced Degrees - 2022

- Ph.Ds – 141
- Masters - 1,331

Total Annual Funded Program - 2022

- $2 billion
- Contracts issued: $1 billion

Dahlgren Division Leadership

Dale W. Sisson, Jr., SES
Technical Director

Captain Philip Mlynarksi, USN
Commanding Officer

Dahlgren Division Sites

NSWC INDIAN HEAD DIVISION

NAVAL SEA SYSTEMS COMMAND

WARFARE CENTERS

2022 Highlights

Certification of PBXIH-143: The command received certification of a new energetic material — PBXIH-143 — a product nearly two decades in the making. With the collaboration of nearly all the command's technical departments, the Office of Naval Research, and others, a major milestone in the future of energetics was achieved. This year saw the successful completion of an initial mix of the material and two subsequent mixes over the following months. The cured and assembled test articles were shipped to Aberdeen Proving Ground and Fort AP Hill in Virginia. The resulting underwater and airburst detonations exceeded all performance expectations and is a prime example of the Navy's only arsenal drawing upon its collective resources and operating as intended: rapidly molding molecules into explosives that fulfill the warfighter's mission without sacrificing quality or employee safety

Eliminate Risks to Military Aircraft Ejection Seats: After an ejection seat manufacturer notified the command's CAD/PAD Joint Program Office (JPO) and the F-35 JPO of an issue that would prevent CADs installed on the F-35 ejection seat from functioning correctly, risking many lives across all of the services, personnel developed and validated a non-destructive procedure to verify if suspect devices contained the required energetic ingredients. Expeditionary Exploitation Unit ONE developed a portable radiographic inspection procedure to support on-site testing of aircraft for this particular defect, which was implemented around the world to support F-35 aviation readiness.

The production processes were updated to address concerns when the manufacturer again notified the CAD/PAD JPO of this issue's applicability to other ejection seats. After Naval Air Systems Command paused impacted aircraft operations, which temporarily grounded a number of U.S. and foreign military aircraft, Indian Head responded with around-the-clock support to inspect suspect items identified within existing stockpiles. More than 4,400 items were screened and validated with no defects found before their return to usable inventory, much of which was quickly packaged and shipped by truck, helicopter or aircraft.

Ribbon Cutting to Declare Its Agile Chemical Facility Open for Business: On June 13, leadership cut the ribbon to officially declare the command's Agile Chemical Facility (ACF) open for business. The $100 million liquid nitrate ester manufacturing facility is a critical capability for the Navy and the Defense Industrial Base Sector. The ACF consolidates the capabilities of both the legacy Biazzi and Moser nitration facilities — built in the 1950s and 1960s, respectively — into one highly automated complex capable of production-scale manufacturing of six different liquid nitrate esters used in various DoD products.

NSWC INDIAN HEAD DIVISION

NAVAL SEA SYSTEMS COMMAND

WARFARE CENTERS

Naval Surface Warfare Center Indian Head Division (NSWC IHD) brings together the largest full spectrum energetics facility in the Department of Defense (DoD) with the largest concentration of explosive ordnance disposal (EOD) technology resources and information in the world.

Energetics are explosives, propellants, pyrotechnics, reactive materials, related chemicals and fuels used in propulsion systems and in ordnance.

One of 10 Warfare Center divisions within the Naval Sea Systems Command (NAVSEA) enterprise, the main site for NSWC IHD is a 3,200-acre peninsula along the Potomac River on Naval Support Facility Indian Head, in Indian Head, Md.

NSWC IHD has a separate EOD campus, also in Indian Head, Md.; two official detachments in Picatinny, N.J. and McAlester, Okla.; six off-site locations; and employees stationed throughout the world.

NSWC IHD has the largest workforce in the DoD dedicated to energetics and EOD — over 2,300 strong and comprised of more than 900 scientists and engineers (more than 50 holding doctorates). The command also boasts EXU-1, an Echelon V command dedicated to collecting, processing, exploiting and analyzing improvised and conventional weapons, ordnance and components; and to providing near real-time targeting information and intelligence to EOD forces. The division's business base totals approximately $1.1 billion.

The Division's unique synergy and balanced capabilities address all aspects of the energetics technical discipline including basic research, applied technology, technology demonstration, prototyping, engineering development, manufacturing, acquisition, low-rate production, scale-up, in-service engineering/mishaps, failure investigations, surveillance, EOD technology/information and demilitarization.

Mission

Provide research, development, engineering, manufacturing, test, evaluation and in-service support of energetic systems and materials (chemicals, propellants and explosives) for ordnance; warheads; propulsion systems; pyrotechnic devices; fuzing, electronic devices; cartridge actuated devices and propellant actuated devices (CAD/PAD); packaging, handling, storage and transportation (PHST); gun systems; and special weapons for Navy, Joint Forces, and the Nation. Develop and deliver EOD technology, knowledge, tools and equipment and their life cycle support through an expeditionary work force which meets the needs of the Department of Defense, combatant commanders, and our foreign and interagency partners. Execute other responsibilities as assigned by Commander, Naval Surface Warfare Center. Support the Executive Manager for EOD Technology and Training.

Vision

As a field activity of the Naval Sea Systems Command and part of the Naval Research and Development Enterprise, NSWC IHD is the leader in ordnance, energetics and EOD solutions for the Department of Defense.

Technical Capabilities

- Threat and Countermeasure Information Development and Dissemination for Explosive Ordnance Disposal (EOD), Improvised Explosive Device (IED), and Counter Remote Control Improvised Explosive Device (RCIED) Electronic Warfare (CREW)
- Technology Development and Integration for EOD, IED, and Specialized CREW Applications
- Energetic and Ordnance Component and Ordnance Systems for Science & Technology, Emergent and National Need Requirements
- Energetic and Ordnance Components and Ordnance Systems for Air Warfare
- Energetic and Ordnance Components and Ordnance Systems for Surface Warfare
- Energetic and Ordnance Components and Ordnance Systems for Expeditionary and Undersea Warfare
- EOD Unmanned Systems
- Conventional and Improvised Weapons Exploitation
- Chemical, Biological, and Radiological Defense Systems
- Force Protection Systems Engineering, Integration, and Equipment Ashore

Major Facilities

- Aircrew Escape Ordnance Devices Development & Prototyping Complex
- Detonation Physics Research, Development, Test and Evaluation (RDT&E) and Acquisition
  - Bombproofs, blast chambers, self-contained gun ranges
- Solventless and Solvent-Based Energetics Processing Facilities
- Novel Materials R&D
  - Nano-energetic materials characterization
  - Complete suite of analytical capabilities
- Cast Composite Rocket Motor and PBX R&D & Scale-Up Complex
- Ordnance Test Facilities
- Chemical, Physical Property and Metallurgy Labs
- Quality Evaluation/Surveillance Facility
- Specialty Energetic Chemical Scale-up Facility
- High Pressure Explosives, Physics & Combustion Lab
  - Bomb testing, Strand burning; Combustion instability testing
- Microelectromechanical Systems (MEMS) Explosives-rated Clean Room
- Underwater Warheads RDT&E and Modeling & Simulation
- Foreign Ordnance Electronics Exploitation Laboratory
- Magnetic Signature Test Facility
- Ordnance Disassembly Complex
- Hypervelocity Test Facility
- Oxygen Cleaning Laboratory-EOD Diver Complex
- Gun Test Facility
- Packaging, Handling, Storage and Transportation Test Lab
- Gun Integration facility (Turret Facility)

Workforce Profile - 2022

- Total: 2,391
- Scientists & Engineers: 1,201

Advanced Degrees - 2022

- Ph.Ds – 93
- Masters - 385

Total Annual Funded Program - 2022

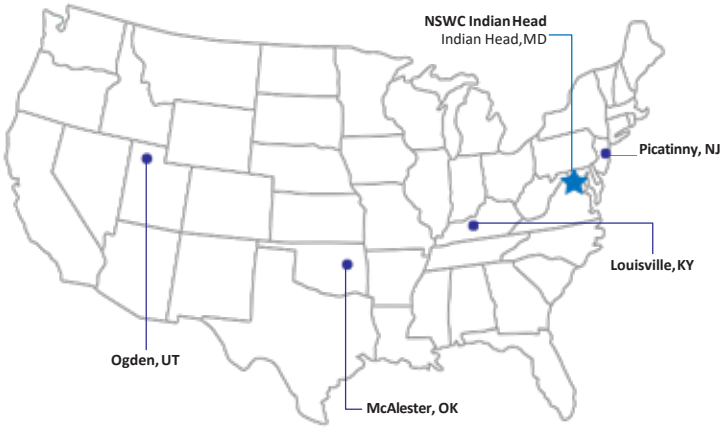
- $900 million
- Contracts issued: $500 million

Indian Head Division Leadership

Ashley G. Johnson, SES
Technical Director

Captain Steve Duba, USN
Commanding Officer

Indian Head Division Sites



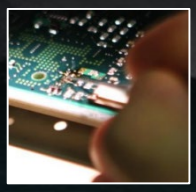
NUWC KEYPORT DIVISION

NAVAL SEA SYSTEMS COMMAND

WARFARE CENTERS

2022 Highlights

FY22 IMA Throughput Success: The Undersea Weapons Department's Intermediate Maintenance Activity (IMA) completed the highest number of Lightweight (LWT) torpedo deliverables since fiscal year 2012. This achievement resulted from coordination of IMA stakeholders. By establishing and communicating the unit goal per week, work centers were able to coordinate efforts for staffing levels and material quantities enabling the production floor to meet the goal. The IMA stakeholder team created the driving force for quality and effectiveness centered on pushing decision making and empowerment to the right level. This outcome allows for a model that the IMA will carry into the future for a better, faster and cheaper solution to torpedo throughput.



Miniature Microminiature /Module Test and Repair (2M/MTR) Project Transfers: The Navy's Miniature Microminiature (2M)/Module Test and Repair (MTR) program transitioned to Keyport this year. The 2M/MTR Program provides the test, diagnostic, and repair equipment, tools, techniques and training required for Navy and DoD electronic technicians to perform diagnostic testing and reliable, quality repairs on complex circuit card assemblies and other electronic and avionics modules for ships, submarines, and aircraft. The program also supports electronic testing and repair at the organizational and intermediate, and Naval Shipyard maintenance levels. 2M/MTR saves operating target funds by avoiding potential maintenance costs associated with reliance on depots, resulting in an overall improvement to fleet readiness and increased self-sustainability. This work is a key aspect to Keyport's mission for platform sustainment and leverages the value-chain of logistics, sustainment, obsolescence management, and reverse engineering of parts to provide critical parts and repairs to the fleet to increase at-sea time.

SURTASS-E System Lead Integrator: Keyport and NUWC Newport were designated as the System Lead Integrator (SLI) for the SURTASS-E system, the expeditionary variant of the SURveillance Towed Array Sensor System (SURTASS). Consisting of multiple ISO containers (i.e. vans) which house all mission systems including passive processing, towed array, and C4I, along with power requirements, repair capabilities, and spares, these systems are deployed on-board of vessels of opportunity as needed to meet Maritime Surveillance Systems mission requirements by providing a needed passive SURTASS capacity without requiring additional purpose built platforms. NUWC has been designated to conduct pre- and post- assembly, integration, and validation of ISO mechanical, electro-mechanical, and electrical/electronic systems. NUWC is partnering with Johns Hopkins University Applied Physics Laboratory and the PMS485 Program Office to conduct system knowledge transfer in support of the technical, engineering and logistic support tasks to deliver, maintain and sustain SURTASS-E systems. These systems are critical for advancing our Navy's undersea monitoring capabilities in areas of the world experiencing strained geopolitical environments.

NUWC KEYPORT DIVISION

NAVAL SEA SYSTEMS COMMAND

WARFARE CENTERS

With a proud history spanning more than 100 years, NUWC Keyport Division is a global network of people, facilities, and capabilities, united in all we do by a culture of innovation and a common purpose: to expand America's dominance in the undersea domain. One of two divisions of the Naval Undersea Warfare Center, NUWC Keyport Division's advanced technical capabilities directly support the full spectrum of Navy undersea programs.

NUWC Keyport Division's primary location is in the community of Keyport, Washington, on the Kitsap Peninsula. Other Washington locations include an annex at Naval Base Kitsap-Bangor, and undersea ranges in Puget Sound and the Hood Canal, which combine state-of-the-art support infrastructure with unique natural conditions.

The command also maintains detachments in California and Hawaii, operating sites in Guam and Nevada, an office in Japan, the Naval Sea Logistics Center, in Pennsylvania, and the Nanoose Range in the waters of British Columbia, Canada. Our people frequently deploy around the world to support the U.S. fleet and allied militaries.

NUWC Keyport Division's current workforce consists of approximately 2,200 civilians and 30 Sailors.

Mission

Provide advanced technical capabilities for test and evaluation, in-service engineering, maintenance and industrial base support, fleet material readiness, obsolescence management and logistics support for undersea warfare.

Execute other responsibilities as assigned by the Commander, Naval Undersea Warfare Center.

Vision

Expanding America's Dominance in the Undersea Domain

Technical Capabilities

- Pacific Undersea Warfare (USW) Test and Evaluation (T&E) Range and Test Facility Operations
- Independent USW Systems T&E and Experimentation
- Undersea T&E Test Systems
- Undersea Weapons Maintenance and Repair
- Obsolescence Management & Sustainment Technology Solutions
- Undersea Warfare Systems Material Depot
- Undersea Weapons In-Service Engineering (ISE) and Integrated Product Support (IPS)
- Submarine USW Systems ISE and IPS
- Theater USW Systems
- Fleet Training and Training Management Systems
- Naval Sea Logistics Center (NSLC): IPS for Surface and Undersea Systems
- NSLC: Central Design Agent for Navy and NAVSEA Corporate Logistics Data Systems
- NSLC: Ships Planned Maintenance System
- NSLC: NAVSEA Operating Materials and Supplies (OM&S) Management
- Unmanned Undersea Vehicle Maintenance and Repair
- Unmanned Undersea Vehicles ISE and IPS

Major Facilities

- Additive Manufacturing and Rapid Prototyping Technologies Facilities (Keyport)
- Collaborative Test & Evaluation Capability Center (Keyport)
- Combat Systems Depot (Keyport)
- Custom Engineered Solutions/Obsolescence Resolution Facilities (Keyport)
- Fleet Integrated Simulation Technology Testing Facility (Pearl Harbor)
- Fleet Operational Readiness Accuracy Check Sites (Hawaii)
- Fleet Test and Evaluation Facilities (San Diego and Hawaii)
- In-Service Engineering Facility (Keyport)
- Magnetic Silencing Facilities (Pearl Harbor)
- Pacific Northwest Undersea Range Complex (Washington)
- Repair Technology Development Complex (Keyport)
- San Clemente Island Underwater Range (California)
- Shipboard Electronic Systems Evaluation Facilities (Hawaii)
- Torpedo, Anti-Torpedo and UUV Maintenance Depot/Intermediate Maintenance Activity (Keyport and Pearl Harbor)
- Torpedo Demilitarization Facilities (Hawthorne)
- Torpedo Exercise Support Facility (Guam)
- Undersea Warfare Mines Depot (Hawthorne)
- Unmanned Undersea Vehicle Homeport/Barb Hall (Keyport)

Workforce Profile - 2022

- Total: 2,721
- Scientists & Engineers: 954

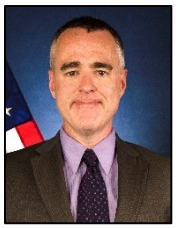
Advanced Degrees - 2022

- Ph.Ds – 24
- Masters - 455

Total Annual Funded Program - 2022

- $900 million
- Contracts issued: $400 million

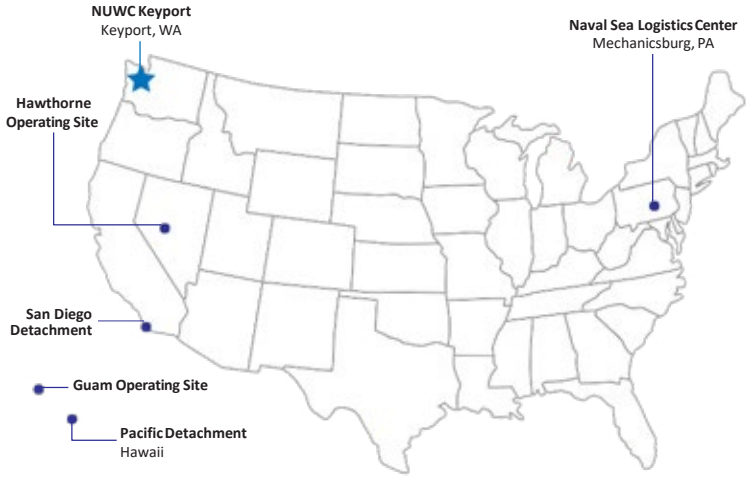
Keyport Division Leadership



Darren Barnes
Technical Director (Acting)

Captain Clinton P. Hoskins, USN
Commanding Officer

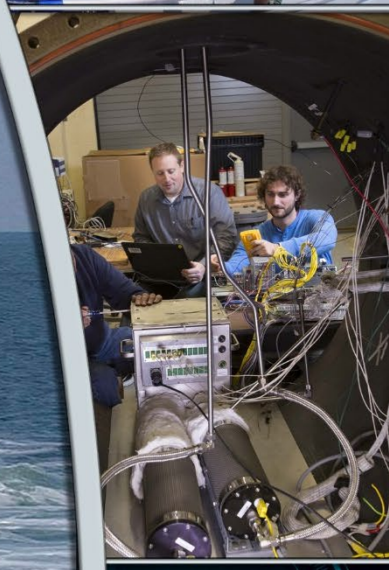
Keyport Division Sites



NUWC NEWPORT DIVISION

NAVAL SEA SYSTEMS COMMAND

WARFARE CENTERS



2022 Highlights

Snakehead Large Diameter Unmanned Undersea Vehicle: In February, christened the Snakehead Large Displacement Unmanned Undersea Vehicle (LDUUV). By July, a U.S. Navy team, led by Newport, demonstrated an end-to-end Intelligence Preparation of the Operational Environment (IPOE) mission with the Snakehead prototype at the Narragansett Bay Test Facility. Snakehead, a modular, reconfigurable, multi-mission LDUUV deployable from submarines and surface ships, provides guidance and control, navigation, situational awareness, propulsion, maneuvering, and sensors in support of the IPOE mission. Snakehead is innovative in the areas of hull materials, lithium-ion battery certification, advanced sensors, and launch and recovery from both submarines and surface vessels. Snakehead is the Navy's most advanced UUV providing significant increased mission capabilities.

Direct Fleet Support: Newport's Naval Array Technical Support Center delivered over 520 towed array modules. Newport delivered 11 new submarine SONAR build updates and provided support for the Acoustic Augmentation Support Program for 52 submarine platforms. There were 20 towed system ISEA events and 18 AN/SQQ-89(V) Undersea Warfare Combat Systems in-service support to 18 fleet events. The team fielded 25 Light Mitigation Kits to Atlantic and Pacific Fleet combatants. Also successfully completed the installation of submarine networks and integrated applications on 10 submarine platforms, which were comprised of the Consolidated Afloat Network Enterprise Services Infrastructure, Global Command and Control System – Maritime Command and Control system, and the Nosis Integrated Information Management System. Utilizing a newly established capability, Newport repaired photonics masts and rotational modules in support of the submarine fleet and established the Radar Designated Overhaul Point to improve responsiveness, increase capability and complete infrastructure fabrication of the new COLUMBIA Common Submarine Radio Room facility.

Undersea Superiority: Today and Tomorrow: Recognized as the Navy's stewards of undersea expertise, hosted over 20 distinguished visitors in FY22, including: the Deputy Secretary of Defense, the Undersecretary of Defense, the Secretary of the Navy, Chief of Naval Operations and 6 Members of Congress. On undersea capabilities, "As protectors of the most survivable leg of the nuclear triad, our Navy must take this threat seriously, maintaining a constant, overwhelming strategic deterrent to keep our adversaries in check. We must maintain our tactical undersea advantage, with the posture and capability to respond with stealth and speed," Secretary of the Navy, Carlos Del Toro – at NUWC Newport.

NUWC NEWPORT DIVISION

NAVAL SEA SYSTEMS COMMAND

WARFARE CENTERS

NUWC Newport Division, one of two divisions of the Naval Undersea Warfare Center, is the Navy's full-spectrum research, development, test and evaluation, engineering, and fleet support center for submarine warfare systems and many other systems associated with the undersea battlespace. NUWC Newport Division provides the technical foundation that enables the conceptualization, research, development, fielding, modernization, and maintenance of systems that ensure our Navy's undersea superiority.

NUWC Newport Division is responsible, cradle to grave, for all aspects of systems under its charter, and is engaged in efforts ranging from participation in fundamental research to the support of evolving operational capabilities in the U.S. Navy fleet. The major thrust of NUWC Newport Division's activities is in applied research and system development.

With headquarters in Rhode Island, NUWC Newport Division operates detachments at West Palm Beach, Florida and Andros Island in the Bahamas. Remote test facilities are located at Seneca Lake and Fisher's Island in New York; Dodge Pond in Connecticut; Fort Story, Virginia; Okahumpka, Florida; and Rota, Spain.

Mission

NUWC Newport Division provides research, development, test and evaluation, engineering, analysis, and assessment, and fleet support capabilities for submarines, autonomous underwater systems, and offensive and defensive undersea weapon systems, and stewards existing and emerging technologies in support of undersea warfare. Executes other responsibilities as assigned by the Commander, Naval Undersea Warfare Center.

Vision

Undersea Superiority: Today and Tomorrow

Technical Capabilities

- Undersea Warfare (USW) Communication Systems
- USW Communication Antenna Systems
- USW Combat Systems
- USW Trainer Systems
- USW Sensor and Sonar Systems
- Submarine Periscopes and USW Imaging Systems
- USW Electronic Warfare, Signal Intelligence (SIGINT), Information Operations (IO) Sensors and Systems Integration
- Undersea Surveillance Systems
- USW Launcher Systems and Payload Integration
- USW Platform Tactical Missile Integration
- USW Autonomous Vehicles
- Torpedo and Sonar Defensive and Countermeasure Systems
- Torpedoes and Undersea Weapons
- USW Analysis
- USW Environmental Assessment Effects Analysis
- Undersea Range Technology and Application
- USW Systems Test and Evaluation
- Subsea and Seabed Systems (Newport missions)
- Atlantic USW Test & Evaluation (T&E) Range and Training Operations
- Submarine Electromagnetic Environmental Effects (E3)

Major Facilities

- Acoustic Wind Tunnel
- Anechoic Chamber
- Chemistry Lab
- Combat Systems Evaluation & Analysis Laboratory
- Environment Centric Weapons Analysis Facility
- Launcher Laboratory
- Narragansett Bay Test Facility
- Over-water Arch Facility
- Propulsion Test Facility
- Quiet Water Tunnel
- Submarine Towed and Deployed Systems Research, Development, Test and Evaluation Complex
- Survivability Test Facility
- Undersea Warfare Analysis
- Virginia Payload Tube Facility

Workforce Profile - 2022

- Total: 3,618
- Scientists & Engineers: 2,787

Advanced Degrees - 2022

- Ph.Ds – 151
- Masters - 983

Total Annual Funded Program - 2022

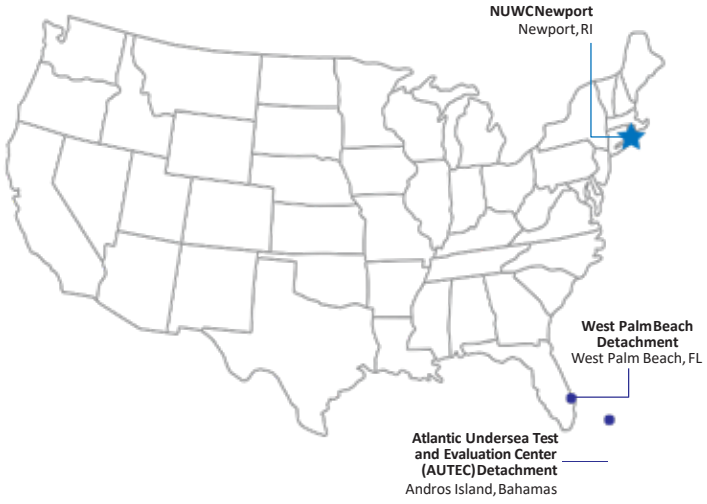
- $1.4 billion
- Contracts issued: $800 million

Newport Division Leadership

Rebecca Chhim
Technical Director (Acting)

Captain Chad Hennings, USN
Commanding Officer

Newport Division Sites



NSWC PANAMA CITY DIVISION

NAVAL SEA SYSTEMS COMMAND

WARFARE CENTERS

2022 Highlights

INSPIRE - *Igniting a Culture of Leadership and Innovation*: Hosted a full-day event in August to educate and challenge its workforce on building and sustaining a diverse and innovative work environment. This was the first Leadership in a Diverse Environment event the lab has hosted, featuring guest speakers to educate attendees and provide practical application steps to help leaders explore and expand their impact. Aligning with one of NAVSEA Warfare Center's strategic goal of having the 'Right Culture/Values,' the event encouraged the workforce to be inclusive and engage as a One Team collaborative culture.

Highest Score Recorded for NAVSEA Warfare Center Headquarters Annual Property Audit : Achieved an overall score of 86%, which is the highest score ever recorded on the NAVSEA Warfare Center Headquarters Annual Property Management Assessment. In addition, the General Equipment Branch achieved a perfect score of 100%, which is a first in the history of the audit.

Initial Operating Capability Declared for Unmanned Influence Sweep System (UISS) : In partnership with PEO Unmanned and Small Combatants, led the technical acquisition effort and test team to Initial Operating Capability for the UISS, a critical component of the Navy's suite of mine countermeasure technologies. Capable of being operated from littoral combat ships, shore, or vessels of opportunity, UISS provides acoustic and magnetic minesweeping coupled with the semi-autonomous, diesel-powered, aluminum-hulled Mine Countermeasures Unmanned Surface Vehicle (MCM USV). The MCM USV is an integral part of the MCM mission package and serves as the tow platform for both minesweeping and mine hunting missions.

NSWC PANAMA CITY DIVISION

NAVAL SEA SYSTEMS COMMAND

WARFARE CENTERS

Located on over 650 acres along St. Andrews Bay in Panama City, Florida, NSWC Panama City Division is the Navy's technical center of excellence for littoral warfare and coastal defense. NSWC Panama City Division employs over 1,400 civilian employees, of which the majority are scientists and engineers, who research, develop, test and evaluate capabilities in four core mission areas of mine warfare, diving and life support, naval special warfare and amphibious and expeditionary warfare. NSWC Panama City Division also patents innovative ideas and rapidly prototypes tomorrow's capabilities to fleet users by capitalizing on a talented workforce and a prime location on the Gulf of Mexico.

Mission

The mission of Naval Surface Warfare Center Panama City Division is to conduct research, development, test and evaluation, in-service support of mine warfare systems, mines, naval special warfare systems, diving and life support systems, amphibious/expeditionary maneuver warfare systems, other missions that occur primarily in coastal (littoral) regions and to execute other responsibilities as assigned by Commander, Naval Surface Warfare Center.

Vision

Ensuring Warfighting Dominance in the Littoral Battlespace

Technical Capabilities

- Personal Protective Systems for Extreme Environments
- Expeditionary, Littoral, and Maritime Security System Engineering and Integration
- Air Cushion Vehicle Systems
- Expeditionary Maneuver Warfare Systems Engineering and Integration
- Special Warfare Maritime Mobility Mission Systems and Mission Support Equipment
- Mine Countermeasures (MCM) Detect and Engage Systems, Modular Mission Packaging, and Platform Integration and Handling
- Littoral Mission Systems Integration and Modular Mission Packages Certification
- Unmanned Systems Engineering & Integration, Autonomous Operations, Joint Interoperability and Common Control
- Mine Sensor and Target Detection Technology, Mine Delivery Integration, and Minefield Architecture
- Diving and Life Support Systems
- Surface Life Support Systems for Extreme Environments
- Subsea and Seabed Systems (Panama City missions)

Major Facilities

- Mine Warfare Complex
- Littoral Warfare Research Facility
- Littoral Warfare Systems Facility
- Diving & Life Support Complex
- Special Warfare Research Engineering Complex
- Expeditionary Warfare Complex
- Landing Craft Air Cushion Facility
- Human Systems Integration Usability Lab
- USMC Amphibious Raids and Reconnaissance Integration Facility
- Coastal Test Range
- Prototype Fabrication Facility
- Fanselau Coil Facility
- Joint Gulf Test Range

Workforce Profile - 2022

- Total: 1,659
- Scientists & Engineers: 1,070

Advanced Degrees - 2022

- Ph.Ds – 72
- Masters - 434

Total Annual Funded Program - 2022

- $600 million
- Contracts issued: $300 million

Panama City Division Leadership

Dr. Peter Adair, SES
Technical Director

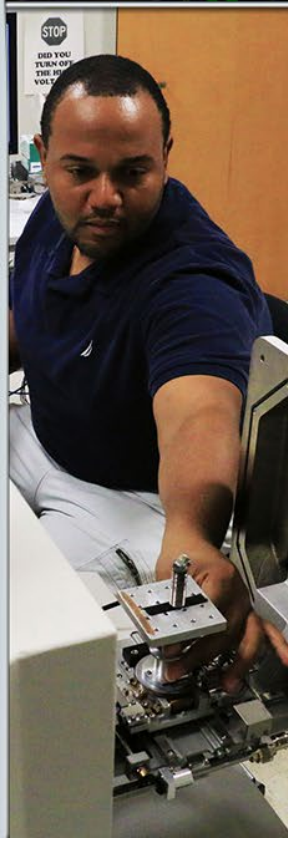
Captain David Back, USN
Commanding Officer

Panama City Division

NSWC PHILADELPHIA DIVISION

NAVAL SEA SYSTEMS COMMAND

WARFARE CENTERS



2022 Highlights

Advanced Weapons Elevators Land Based Engineering Test Site: Selected by PEO Carriers to design, construct and operate the Advanced Weapons Elevators (AWE) Land Based Engineering Test Site (LBETS) in support of CVN 78 Gerald Ford Class-carriers. Philadelphia hosted the formal ribbon cutting ceremony for the AWE LBETS with RADM Downey, PEO for Aircraft Carriers and senior technical community stakeholders in attendance. The Navy's transition to a government-developed software system, known as AWE GOV, is designed to significantly reduce the number of varying shipbuilder-developed software configurations, and along with AWE GOV, will be critical tools for supporting FORD-Class AWEs across the 50 year service-life with a focus on reliability, maintainability, and supportability.

Maritime Sustainment Technology Innovation Consortium (MSTIC) Other Transactions Agreement (OTA): Awarded an OTA for the Maritime Sustainment Technology Innovation Consortium (MSTIC) to Advanced Technology International as the Consortium Management Firm, which allows Philadelphia to gain innovative research findings and state-of-the-art prototypes from industry. MSTIC has provided an alternative approach to traditional Federal Acquisition Regulation (FAR)-based procurements, boasting approximately 325 members, 79% of which are non-traditional defense contractors. In its first year using the OTA authority, the government submitted 23 projects to the MSTIC membership in FY22 for consideration, resulting in the award of 14 prototype project orders valued at approximately $12.3M using a streamlined method of procurement, reducing procurement cycle times by approximately 41% compared to traditional FAR 15 based procurements of the same value. Approximately 50% of the Prototype Project Orders were awarded to non-traditional defense contractors. The MSTIC boasts a diverse group of traditional and non-traditional defense contractors, allowing Philadelphia to stay at the forefront of technological advancements.

Data Analytics/Computing Effort in Response to VCNO Challenge: To enhance the transition of fleet maintenance from time based actions to condition based actions, the Vice Chief of Naval Operations (VCNO) directed a pilot program to evaluate the use of third party vendor supplied data analytics tools along with existing fleet condition based maintenance (CBM) applications. This capability would provide immediate technological advancements in data analytics to support fleet CBM efforts, improving equipment reliability across the fleet. This proof of concept will act as a risk reduction effort with the new FFG 62 class frigates as it will employ an early version of the configuration slated for that acquisition program. Philadelphia received an OTA award for efforts in support of the VCNO CBM acceleration efforts for data analytics, which is currently in the award phase with five industry partners selected. This effort as part of the VCNO pilot program is critical to furthering software edge computing efforts specific to third party analytics running within government hosted software applications to allow for continuous equipment's material condition information onboard Navy platforms without the constant need for shore side data evaluation. It is the beginning of the removal of the "man in the loop" data reviews currently required by the CBM program, thus reducing the time to identify material condition issues allowing for more preventive maintenance and less corrective maintenance.

NSWC PHILADELPHIA DIVISION

NAVAL SEA SYSTEMS COMMAND

WARFARE CENTERS

The Naval Surface Warfare Center (NSWC) Philadelphia Division traces its founding to Nov. 18, 1910, when the Secretary of the Navy established the Fuel Oil Testing Plant (FOTP) to provide technical assistance to the Fleet as the U.S. Navy converted from coal to oil to fire its steam-powered ships.

In the century since, the organization's name has changed as its engineering responsibilities increased in scope: from FOTP; to Naval Boiler Laboratory; Naval Boiler and Turbine Laboratory; Naval Ship Engineering Center, Philadelphia Division; and Naval Ship Systems Engineering Station (NAVSSES).

When the Secretary of the Navy approved the establishment of the NAVSEA Warfare Centers in 1991, NAVSSES became part of the NSWC Carderock Division, but retained its status as a separate command. NAVSSES increased its capability in 1999 with the opening of the Machinery Research and Development Center. On Oct. 1, 2015, the Philadelphia command began the latest chapter in its history when it stood up as an Echelon four-level command, the Naval Surface Warfare Center (NSWC) Philadelphia Division.

NSWC Philadelphia Division is responsible for the machinery systems core equity of the ship and ship systems product area for the U.S. Navy, and serves as a central point for academia and industry to join forces with Navy technical experts to develop solutions to needs in naval machinery.

Consistent with its core equity responsibility, NSWC Philadelphia Division fulfills key functions including research, design, development, shipboard and land-based test and evaluation, acquisition support, in-service engineering, fleet engineering, integrated logistics support and concepts and overall lifecycle engineering.

NSWC Philadelphia Division provides the Navy's primary technical expertise and facilities for both naval machinery research and development and naval machinery lifecycle engineering.

Mission

NSWC Philadelphia Division provides research, development, test and evaluation, acquisition support, engineering, systems integration, in-service engineering and fleet support with cybersecurity, comprehensive logistics, and life-cycle savings through commonality for surface and undersea vehicle machinery, ship systems, equipment and material.

Vision

Shape the Navy's future by continuously expanding machinery systems advantages through technical dominance.

Technical Capabilities

- Surface and Undersea Vehicle Machinery Systems Integration
- Surface and Undersea Vehicle Mechanical Power and Propulsion Systems
- Surface and Undersea Vehicle Electrical Power and Propulsion Systems
- Surface and Undersea Vehicle Auxiliary Machinery Systems
- Surface and Undersea Vehicle Hull and Deck Machinery Systems
- Surface and Undersea Vehicle Machinery Automation, Controls, Sensors and Network Systems
- Advanced Logistics Concepts and HM&E Life Cycle Logistics Support
- Ship Recoverability and Damage Control
- Hull, Mechanical & Electrical (HM&E) for Undersea Vehicle Sail Systems and Deployed Systems
- Shipboard Waste and Hazardous Materials Management Systems
- Surface Ship and Undersea Vehicle Machinery Systems Integrity
- Shipboard Habitability Systems
- SUBSAFE Supervising Authority and SUBSAFE/Level I Material Certification

Major Facilities

- Electric Drive Test Facility (EDTF)
- DDG-51 Land-Based Engineering Station (LBES)
- Shock & Vibration Laboratory (Deck Simulating Shock Machine)
- Submarine Life Support Test Site
- Gas Turbine Life Cycle Support Facility
- Advanced Data Acquisition, Prototyping Technologies, and Virtual Environments Lab (ADAPT.VE)
- Large Scale Machinery Anechoic Chamber
- Submarine Sail Test Site
- Submarine Towed Buoy Facility
- Weapons & Cargo Elevator Land Based Engineering Site
- Shipboard Hydraulics Lab
- Fluid Systems Machinery Silencing Lab
- Depth Control Valve Silencing Facility
- Volumetric Flow Calibration Laboratory

Workforce Profile - 2022

- Total: 2,811
- Scientists & Engineers: 1,848

Advanced Degrees - 2022

- Ph.Ds – 28
- Masters - 646

Total Annual Funded Program - 2022

- $1.3 billion
- Contracts issued: $900 million

Philadelphia Division Leadership

Nigel C. Thijs
Technical Director

Captain Joseph Darcy, USN
Commanding Officer

Philadelphia Division

NSWC PORT HUENEME DIVISION

NAVAL SEA SYSTEMS COMMAND

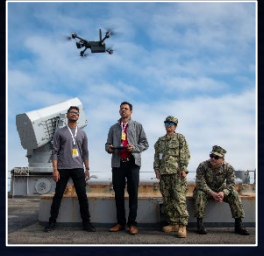
WARFARE CENTERS

2022 Highlights

Ribbon Cutting Marks Opening of Aegis Computer Lab: The Aegis Computer Lab — the first new building on the grounds of Port Hueneme in over two decades — officially opened in late August with a ribbon-cutting ceremony and a tour of the 5,000-square foot, state-of-the-art facility's powerful computing center capabilities to support the fleet. The new Aegis Computer Lab will provide a single facility to develop Aegis software tools for multiple Aegis baselines and to develop equipment ordnance alterations and ship alterations for Aegis and common users. The newer and surrounding Aegis complex will also provide an environment to support engineering investigations.

Executed Successful Live Fire for the Aegis Capability Package: Port Hueneme's In-Service Engineering Agents participated in the joint Missile Defense Agency/Navy effort in the execution of Flight Test Experimental Aegis Weapon System-01 (FEM-01), also known as Stellar Perseids. During the mission, USS SHOUP (DDG 86), an Aegis Ballistic Missile Defense system-equipped destroyer, successfully engaged a Medium-Range Ballistic Missile target with a Standard Missile-3 (SM-3) Block IIA missile on the Pacific Missile Range Facility, northwest of Kauai. This successful flight test was especially notable because it was the first SM-3 live-fire for the Aegis Capability Package computer program with a new suite of technology insertion equipment.

Hosted Navy's New REPTX Event Testing Ship Maintenance Technologies: Boosting the Navy's ability to keep ships in top shape while at sea is the goal of a new Repair Technology Exercise (REPTX) that took place at Naval Base Ventura County. More than 60 technology suppliers tested their products' capacity to tackle real-world fleet maintenance challenges, including assessing and repairing potential battle damage during REPTX's 12 days of technical demonstrations and field experiments aboard the Navy's Self Defense Test Ship, a Port Hueneme asset. REPTX offers a unique opportunity to evaluate innovative products and services that could potentially help Sailors carry out the repairs needed to keep ships underway.



NSWC PORT HUENEME DIVISION

NAVAL SEA SYSTEMS COMMAND

WARFARE CENTERS

Naval Surface Warfare Center Port Hueneme Division (NSWC PHD) maintains technical expertise at locations across the United States with engineering and logistics in Port Hueneme, Calif.; search radar engineering in Virginia Beach, Va.; and live-fire testing in White Sands, N.M. NSWC PHD is the Navy's center of excellence for in-service engineering, test and evaluation, and integrated product support for surface warfare combat and weapon systems. Since its inception in 1963, NSWC PHD has supported fleet combat and weapons systems by providing highly-skilled personnel and state-of-the-art facilities to lead the development and support of Navy surface ship warfare systems throughout their life cycle.

NSWC PHD focuses its technical capabilities on Next Generation In-Service Engineering, which involves direct connectivity to the fleet on a global basis and the immediate availability of around-the- clock access to products, services and fleet-support capabilities. Next Generation In-Service Engineering supports predictive system failure, remote diagnostics and corrective action via real-time networked communications.

Mission

Integrate, test, evaluate, and provide life-cycle engineering and product support for warfare systems

Vision

Keeping our Navy underway, combat ready and effective

Capabilities

"Cradle to Grave" lifecycle engineering and sustainment planning to ensure combat and weapon systems work together effectively to accomplish ship, strike group and theater warfare assigned missions. Naval enterprise area assignments include surface, aviation, expeditionary combat, NETWAR FORCEnet and undersea for over 50 major acquisition programs.

Onshore and at-sea live-fire testing of naval weapons in support of weapon system acquisition (missiles and laser systems), assembly of weapons for live-fire testing, launch of research rockets and assembly, including launch of low and medium fidelity theater ballistic targets.

Technical Capabilities

- Strike Force Interoperability and Theater Warfare Systems In-Service Engineering (ISE), Test & Evaluation (T&E), and Integrated Product Support (IPS)
- Surface and Expeditionary Combat Systems ISE, T&E, and IPS
- Surface and Expeditionary Weapon Systems ISE, T&E, and IPS
- Underway Replenishment Systems ISE, Research, Development, Test & Evaluation, and IPS
- Surface and Expeditionary Missile Launcher Systems ISE, T&E, and IPS
- Radar Systems ISE, T&E and IPS
- Directed Energy and Electric Weapon Systems ISE, T&E, and IPS
- Littoral Mission Module ISE, T&E, and IPS
- Ballistic Missile Defense T&E Specialized Target Vehicle Development, Integration, and Deployment
- National Technical Means and Space Effects Integration

Major Facilities

- Self Defense Test Ship
- Surface Warfare Engineering Facility
- Underway Replenishment Test Site
- Littoral Combat Ship Mission Package Support Facility
- Vertical Launch System Launcher Lab
- Engineering Development Lab
- Desert Ship – White Sands, N.M.
- Radar Lab – Virginia Beach, Va.

Workforce Profile - 2022

- Total: 2,982
- Scientists & Engineers: 1,706

Advanced Degrees - 2022

- Ph.Ds – 17
- Masters - 600

Total Annual Funded Program - 2022

- $1.2 billion
- Contracts issued: $600 million

Port Hueneme Division Leadership

Jeffrey Koe, SES
Technical Director

Captain Tony Holmes, USN
Commanding Officer

Port Hueneme Division Sites