Naval Undersea Warfare Center, Division Keyport

Providing Test, Training & Evaluation Services to the Warfighter and Undersea Warfare Programs
Test, Training & Evaluation Capabilities Strategically Located with our Fleet in the Western Pacific Theater

Keyport, WA
- Undersea Warfare Annex
  - Ordnance Handling/Storage
  - USW T&E

San Diego, CA
- Fleet Operational Readiness
  - FTEC
  - Engineering
  - USW T&E
  - Magnetic Silencing
  - Engineering
  - Pinger Maintenance

Pearl Harbor, Hawaii
- Hawaii Fleet Operational Readiness
  - FTEC
  - SESEF
  - FORACS/USW T&E
  - MK 30 Targets Maintenance
  - Magnetic Silencing
  - Engineering
  - Pinger Maintenance

Apra Harbor, Guam
- Guam NUWC Office
  - Engineering
  - Direct Fleet Support
  - MK 30 Ops

Unique Geographical Characteristics Enabling Full-spectrum Secured USW T&E Ranging

Centrally Located In Major Fleet/DoD Concentration Area
Pacific Northwest Range Sites

Dabob Site

Dabob Site near Submarine Base Ranger provides a compact local CONUS operational test area in an isolated branch of Puget Sound adjacent to the Olympic National Forest. The Dabob Site uses orthogonal short-baseline hydrophone arrays and precisely timed PSK (Phase Shifted Keyed) coded acoustic signals to provide a high-accuracy, high-frequency tracking system. High accuracy tracking covers 9 miles with depths ranging from 500-600 ft.

Nanoose Site

The Nanoose Site is a joint Canadian-US test facility located in the Straights of Georgia between Vancouver Island and the Province of British Columbia. It provides the largest most-deep active tracking area of the Pacific Northwest Range Complex. The Nanoose Site shares the same basic tracking technology as the Dabob Bay Site, with highly accurate track covering a 50-nmi area provided by 29 short-baseline arrays. The Nanoose site water depth is 700-1300 ft.

Quinault Site

The Quinault Site is located off the west coast of Washington State near Destruction Island. It provides a unique shallow-water littoral test area where the tracking range to depth ratio can easily exceed 500:1. The development of this site pioneered the introduction of the reverberation-tolerant SFSK [Spaced Frequency Shift Keying] tracking technology that has not been surpassed for tracking in such critical environments.

Keyport Site

The original torpedo range was located in the shallow waters adjacent to MWR Division Keyport. Requirements for deeper water moved torpedo running out of these waters. Keyport is experiencing a resurgence in activity in these shallow water areas, as it is found to be ideal for UUV (Unmanned Underwater Vehicle) testing. With depths of 200 ft and less, this area continues to be an important part of the Pacific Northwest Range Complex.
Portable Test & Evaluation... Anytime/Anywhere

Portable Systems

The Pacific Northwest Range Team provides several tracking systems that may be transported to any site. Each has its own strengths and should be considered for specific applications and environments.

**SWIFT Range**

- Increased emphasis on operations in shallow/littoral environments
- SWIFT Range architecture is designed to support any small vessel or platform such as a Surface Vessel, Surface A_common
- SWIFT Range can be used to observe small and deep environments
- SWIFT Range provides increased, real-time tracking of multiple underwater, surface, and above-water participants

**TCT**

- The TCT system provides high-accuracy, real-time tracking data relative to a single fixed or mobile reference point or target
- TCT is an Ultra-Short Baseline (USB) tracking system that can be mounted on a suitable submarine target
- The USB array is installed on the exterior of the submarine, while the TCT system is deployed on the submarine itself.

**PITS**

- PITS is an acoustic modem transponder system designed for temporary deployment in shallow-water environments.
- It uses an acoustic modem-based tracking system and takes advantage of the transponder features of the modem to determine the range between the modem on an underwater vehicle and a selected bottom-moored modem or PITS transponder.
Collaborative Test Events

Visualization via SIMDIS
SIMDIS, a 3-D visualization tool developed by the Naval Research Laboratory, is rapidly becoming the standard for displaying targeted operation data. SIMDIS is being used extensively by CTC to support Test & Evaluation Events.

CTEC
CTEC (Collaborative Test & Evaluation Capability)
The US Department of Defense & Homeland Security are transforming to prepare for maritime threats & the environment of the 21st Century. To address this need, MDWIC Division Report has identified a core set of capabilities, collectively referred to as CTC. CTC advances the idea that Test, Training, Experimentation, & Evaluation activities should be inherently integrated to optimize the efficiency & effectiveness of maritime support, joint operations & programs. Its single organizational or facility can be the center of the US Navy's transformational philosophy. However, each collaboration facility must possess a minimum level of capability to participate in distributed exercises. CTC is a premier maritime T&TE collaboration facility where users can plan event scenarios, (open & monitor local & remote users during events, present event information to local & remote viewers, & evaluate event data & provide rapid feedback.

Event Insight via ESMS
The Event Streaming Media System (ESMS) allows event participants to receive synchronized audio & video streams of instrumented ranges & event users ESMS is based on industry-standard Adobe Flash streaming technologies. Streams are presented via a web-browser interface or on a network-enabled PC.
Environmental Test Facility

The Environmental Test Lab has developed a unique combination of expertise & technology in test methodology, equipment & program administration. The lab specializes in design verification & development, reliability & component life prediction of environmental conditions. Many environments can be simulated such as temperature, vibration & functional testing. Kepport has unique test systems for size & extreme environments. Some capabilities are:

VIBRATION
3-axis simultaneous electrodynamic vibration system

HALT/HASS
Shock Response Spectra (SRS)
Replication of field data drop & shock data up to 4,000 g

CLIMATIC
Temperature extremes from -100°F to 300°F [−73.1°C to 150°C]
Humidity, freeze, solar radiation

UNIQUE EQUIPMENT
3-axis Rate table with temperature conditioning & shock data simulation

Failure Analysis

The Kepport Failure Analysis Lab offers:

- Light Microscopy & Electronic Photo-documentation
- Metallographic Sample Preparation & Analysis
- Scanning Electron Microscope (SEM) for magnification up to 500,000 times
- Energy Dispersive Spectroscopy (EDS) for elemental determination
- Fourier Transform-Infrared Spectrometer (FT-IR) for organic analysis
- Real-time X-ray inspection that can penetrate samples up to 0.650 in-thick aluminum & 0.425 in-thick steel with 2-micron detail detectability
- Tension & Compression Testing
- Hardness Testing
- Electrical Failure Isolation, including component & interconnect failures
- Integrated Circuit Decapsulation
- Die level electrical micro-probing
- Curve tracer electrical characterization of discrete components: I-V & Circuit boards with up to 2,000 volt output & nanoamp current resolution
- Labview based rapid test set development

Failure Analysis Lab
The Failure Analysis Lab at Kepport Division supports the fleet by providing independent root cause analysis & corrective action for material & characterization services on-site. The lab’s services are used to increase the reliability of weapon systems and reduce fielded failures. This reduces the need for independent analysis & corrective action for maintainability & reliability of aircraft, ships, ground & other weapon systems.
Our People
Experience to Meet Unique Needs

Range Management & Operations Division

Maintains & operates all of Pacific Northwest Range sites is the responsibility of the personnel within this Division. This Division schedules all tests conducted on the range sites, ensuring customer schedules & test needs are met.

USW Weapons & Product Acceptance Division

Responsibilities within the Division include readiness assessment of operational USW ships, ship systems & weapons. They perform test data processing required for analysis & evaluation of T&E events. Responsibilities within this Division include land based test & failure analysis.

USW Systems Test & Operational Assessment Branch

This Division provides test planning and coordination along with reliable test measurement systems. Division personnel are responsible for identifying, acquiring, calibrating & modernizing T&E systems, both fixed & portable, as well as R&D test vehicles & targets.

Hawaii Fleet Operational Assessment Division

Located near Honolulu, Hawaii, this Division provides the Fleet, acquisition community, Joint Forces & Allies with T&E, Training & Evolution products & services in Hawaii, Guam, WESTPAC, Pacific Rim, East Coast & Worldwide. The Division supports the Fleet & Allies with underwater mobile targets, underwater tracking range equipment & USM operational assessment for training & shipboard systems testing for assorted vessels. Support to the acquisition community includes Trusted Agent & Shipboard T&E for USW systems. Interoperability & tactical data testing supports the Joint systems. This Division also provides engineering support to Hawaii-based S&T projects. The Division is HNBDC’s forward presence in the Pacific, strategically positioned at the “Tip of the Spear.”

SOCAL Fleet Operational Readiness Division

Located in San Diego, this Division supports fleet readiness by managing the air, surface, submarine, combat system test & analysis, weapons evaluation, mobile target, tactical exercise analysis, maritime sensor evaluation & range support programs in the Southern California area. Operations include SCUB, SUBOFF, FORCIVS, MTE, SIMROH & DEEMJ ship test ranges in the Southern California area.