

**MILITARY VALUE DATA CALL**  
**TECHNICAL CENTERS**

<b>Category</b>	
<b>Technical Center Site</b>	Naval Undersea Warfare Center Division, Keyport
<b>Location/Address</b>	NAVUNSEAWARCENDIV 610 Dowell Street Keyport, WA 98345-7610

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**TAB A** Technical Operations: Functional Support Area - Life Cycle Work Area Form

**TAB B** Facilities and Equipment: Facilities/Equipment Capability Form

**TAB C** Range Resources: Range Capability Form

**Appendix A** Functional Support Areas - Life Cycle Work Areas List

**Appendix B** Definitions for Functional Support Areas - Life Cycle Work Areas



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## MILITARY VALUE MEASURES

### MISSION

1. **Mission Statement.** State the officially assigned mission of this activity and cite the reference document(s) that assigns the mission.

The Naval Undersea Warfare Center (NUWC) Division, Keyport is one of two divisions that comprise the Naval Undersea Warfare Center. The mission of NUWC Division, Keyport, as assigned in OPNAVNOTE 5450 of 23 December 1991, is to support the Navy and the Naval Undersea Warfare Center by providing test and evaluation, in-service engineering, maintenance and repair, fleet support, and industrial base support for undersea warfare systems, undersea weapon systems, countermeasures, and sonar systems.

In the two years since the Naval Undersea Warfare Center was established as part of the Navy's RDT&E, Engineering, and Fleet Support Activities Consolidation Plan, significant further mission purification has taken place. This has eliminated redundant capabilities, focused scarce resources on core mission capabilities, and ensured quality execution of the remaining functions.

During this period, NUWC Division, Keyport has been a Navy pacesetter in implementing the principles and concepts of Total Quality to ensure an organization that works better and costs less, thereby providing customers with best value products and services. The success of these efforts was confirmed by receipt of the Federal Quality Institute's 1994 National Quality Improvement Prototype Award. NUWC Division, Keyport was the only Navy winner and the only Navy finalist for this prestigious award.

In the pursuit of mission purification, the Commander, Naval Undersea Warfare Center has employed a continuous process of self-examination to evaluate past, present, and future mission roles and responsibilities, core technical capabilities, and opportunities for privatization of non-core work. The results of those examinations have focused the mission of NUWC Division, Keyport into the following synergistic areas:

Torpedoes/Targets/Countermeasures/Undersea Vehicles:

- Test and Evaluation for Proofing/Periodics/Qualification.
- Maintenance Engineering for Operational Systems.
- Depot/Intermediate Maintenance Activity Repair.
- Overhaul, Upgrade, Repair, and Progressive Level Maintenance.
- Maintenance and Issue of Approved Hardware and Software Baselines.



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- Engineering and Manufacturing of Out-of-Production Replacement Components for Operational Systems.
- Integrated Logistics/Supply/Fleet Support.
- Off-line Test Equipment Support.

Ranges:

- Range Support for Development, Testing, and Evaluation Testing on Pacific Ranges.
- Range Support for RDT&E Testing on Northwest Ranges.
- Development and Maintenance of Northwest Ranges.

Arctic Program Coordination

Submarine/Surface Ship Combat Control and Sonar/Acoustics:

- Depot Repair and Overhaul.
- Technical Data for Systems Support.
- Manufacturing of Out-of-Production Replacement Components for Operational Systems.
- Supply Support.
- Packaging, Handling, Shipping, and Transportation.

Operational Testing:

- Operational Test and Evaluation of USW systems (Trusted Agent for assigned USW systems).
- Ship ASW systems testing (e.g., Fleet Operational Readiness Accuracy Check Sites, Combat Systems Shipboard Qualification Trials, Shipboard Electronics Systems Evaluation Facility, Weapons System Accuracy Trials) for Pacific Ranges.

To enable NUWC Division, Keyport to accomplish the assigned mission more effectively, four large MILCON projects were recently completed or are currently under construction. These modern, state-of-the-art facilities include the Naval Undersea Warfare Engineering Building; Undersea Warfare Combat Systems Facility; Automated Material Handling Facility; and Hazardous Waste Transfer, Storage, and Disposal Facility. By allowing these MILCON projects to proceed in a very restrictive MILCON environment, the Navy and Congress confirmed the importance and high military value of NUWC Division, Keyport's unique mission.



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2. **Joint Service Missions.** State any officially assigned joint/lead service assignments missions and cite the document(s) that assigned them.

NUWC Division, Keyport has significant joint/lead service assignments and missions in a variety of technical areas. These responsibilities involve relationships with the U.S. Army, Air Force, Navy, and Marine Corps; the U.S. Coast Guard; the Department of Energy; the Department of the Treasury; the Drug Enforcement Agency; the NATO Maintenance and Supply Agency; and numerous allied countries. The general thrust of this question seeks information on situations in which an activity has assignments or missions characterized by mutual reliance outside the agency (i.e., the U.S. Navy). NUWC Division, Keyport has several such assignments in which not only other components of the U.S. Armed Services rely on this Division, but also the armed forces of allied nations through long-standing, formal, international agreements.

Some significant examples of these assignments and missions include:

- NUWC Division, Keyport has a long-standing relationship with Canada for joint operation and maintenance of a state-of-the-art torpedo test range. The in-water ranging capabilities of this unique asset are critical to the undersea warfare technologies of both the United States and Canada.
- NUWC Division, Keyport, through the Foreign Military Sales Program, supports allied governments who depend on this Division's undersea warfare depot for the maintenance of their torpedoes. Additionally, this Division provides torpedo and combat systems in-service engineering support. For most of these countries, NUWC Division, Keyport is the sole source of such support.
- NUWC Division, Keyport is a leader or active participant in both national and regional joint technological initiatives, such as the Joint Services Engineering Data Management and Information Control System, the Continuous Acquisition and Life-Cycle Support Shared Resource Center, and Electronic Data Interchange programs.

This Division's current joint service assignments and missions are described below:

a. U.S.-Canadian Joint Undersea Warfare (USW) Test Range. The U.S. and Canadian Governments have a long-term international agreement providing for the joint operation and maintenance of the world's premier torpedo test range located in the Strait of Georgia at Nanoose, British Columbia, Canada. This joint agreement has been in place for 29 years. This underwater range is a unique asset that is of vital importance to the undersea warfare test capability of both the United States and Canada. Both current and planned high priority undersea warfare programs (i.e., Torpedoes MK 50, MK 48/ADCAP, and MK 46) require use



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of the range for the next several decades. Program Executive Officer (USW) stated, "The single most important core facility is the instrumented underwater test range facility at Nanoose, British Columbia, operated by the NUWC Division, Keyport". Commodore R. L. Preston, the Canadian Government's Director General, Maritime Engineering and Maintenance stated, "The Nanoose Range is operationally essential to the mission and viability of the Canadian Maritime Forces".

The U.S.-Canadian agreement provided the basis for significant Canadian investment (base facilities, range craft, personnel, communications, etc.), thereby reducing U.S. Navy investment (range instrumentation, recovery equipment, targets, range craft, personnel, etc.) "to provide the most capable torpedo development and proof range capability available to the United States and Canada" per COMNAVSEASYSCOM letter dated 20 March 1985 Serial 63Y31/41. (International Agreement with Canada concerning the joint operation of the Nanoose Range, dated 12 May 1965.)

b. Foreign Military Sales. Twenty-three foreign countries and the NATO Maintenance and Supply Organization (NAMSA) utilize NUWC Division, Keyport depot capabilities for overhaul, repair, and refurbishment of undersea warfare defense items. This Division's depot operations are fundamental to maintaining interoperability and interchangeability of these items between the U.S. Navy and those of foreign countries. Two foreign countries rely solely on NUWC Division, Keyport's torpedo Intermediate Maintenance Activity facilities to conduct all of their exercise torpedo preparation, warshot issue, post-exercise maintenance, and warshot periodic maintenance.

NUWC Division, Keyport provides in-service engineering support to 17 foreign countries and NAMSA. In-Service Engineering Agents at this Division provide technical services, documentation, training, spares procurement, logistic support, and configuration management as assigned by Letter of Offer and Acceptance (LOA). Keyport in-service support is invaluable to maintaining the readiness of allied navies' undersea warfare systems. One country also receives Arctic support for their undersea warfare component from this Division's Arctic Submarine Laboratory.

NUWC Detachment Hawaii, as tasked by CINCPAC, conducts testing, analysis, and range operations during joint U.S. operations with Pacific Rim allies (including Japan, Australia, and Canada). The testing consists of Combat Systems Ship Qualification Trials and Fleet Operational Readiness Accuracy Checks. NUWC Detachment Hawaii analyzes heavyweight and lightweight torpedo performance, including Japan's Type 80 torpedo, and vertical launch ASROC performance on Pacific undersea ranges. The Detachment also provides pre-operation planning, on-range technical support, and coordination for these annually scheduled international naval exercises.



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Currently, 143 FMS cases are active. The following undersea warfare systems are assigned FMS cases:

- Torpedoes MK 37, MK 48, and MK 46.
- Targets MK 28, MK 40, and MK 27 (LOA pending).
- Submarine Combat Systems MK 22.
- Surface Ship Combat Systems MK 309, MK 432, MK 53, MK 111, and MK 463.
- Antisubmarine Rocket (ASROC).
- Range Equipment - MK 84 Pinger and MK 1 Transponder.

(As described in the Security Assistance Management Manual, DOD 5105.38-M, FMS authorization is made under the Arms Export Control Act, 1976, as amended. Specific assignments for security assistance to foreign countries are assigned by Letter of Offer and Acceptance, also known as an FMS case.)

c. Joint Project with British Royal Navy, FMS Case United Kingdom UK-P-GSG. NUWC Detachment Arctic Submarine Laboratory provides range support services to the British Royal Navy during Arctic submarine exercises. Detachment personnel provide crew training, participate in at-sea workups, and act as onboard Arctic technical advisers during deployment. (Funding Document N0001994WRBK12F.)

d. Joint Services Engineering Data Management and Information Control System. NUWC Division, Keyport is currently providing engineering support for the Joint Services Engineering Data Management and Information Control System Program Office, NAVSUP 64. As the recognized leader for engineering data management and information control systems, Keyport provides technical representation for the DOD engineering community. This Division is the lead technical consultant to the Joint Services Engineering Data Management and Information Control Systems Program Office for engineering representation providing information-engineering services that will yield increased utilization of the Engineering Data Management and Information Control System at engineering and maintenance sites throughout DOD. (The tasking is done under NAVSUP funding (they are tasked as the lead organization) - document number S04JXCBWR32709.)

e. Engineering Planning System. NUWC Division, Keyport is being tasked by the Joint Center for Flexible Computer Integrated Manufacturing (JC-FCIM) to develop an engineering planning information system. Selection for this development was based on this Division's unique infrastructure and broad experience base with the JC-FCIM recommended Computer



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Aided Design platform. This system will integrate computer applications for planning, programming, and design for migration to other DOD activities. (Executive Director, DON CALS/FCIM Coordination Office letter of 4 October 1993.)

f. Electronic Data Interchange (EDI). NUWC Division, Keyport has been tasked by the Naval Supply Systems Command to develop an EDI system for the Defense Logistics Agency. This system will provide the capability to transfer electronic product information for quoting and order placement. The capability will be migrated to other DOD activities after completion in September 1994. (NAVSUP N0002393WRFAR09 of 9 February 1994.)

g. Equipment Calibration - U.S. Coast Guard. The Navy Calibration Laboratory at NUWC Division, Keyport provides all of the calibration requirements for equipment aboard six U.S. Medium Endurance Cutters and nine High Endurance Cutters. USCG Maintenance Logistics Command Pacific has advised this Division to expect a significant increase in the amount of calibration work to be performed for USCG Cutters because "Keyport can do the work cheaper and faster than anyone else." (Military Interdepartmental Purchase Request (MIPR) #28-94-854625412, MIPR #28-94-85466W072, and MIPR #28-94-854625082.)

h. Electronic Bomb Fuzes. The Environmental Test Facility at NUWC Division, Keyport tests FMU-139 Electronic Bomb Fuzes for the Ogden Air Logistics Center, Hill Air Force Base. The Air Force requested the tests from the Navy because the Environmental Test Facility had already been testing the fuze, a joint service munition, for NAVAIR. (MIPR #FD2020-92-15164.)

The Environmental Test Facility is also funded by the Air Force to remove expended explosive components from FMU-139 bomb fuzes to turn them into training units. (MIPR #FD2020-93-18181.)

i. Data Exchange Agreements. NUWC Division, Keyport is a participating member of Data Exchange Agreements (DEA) and Information Exchange Projects (IEP). DEA's and IEP's are designed to facilitate and expedite the exchange of information between the U.S. and selected countries in the undersea warfare areas of torpedoes, mines, acoustics, and anti-submarine warfare on a bilateral or multilateral basis. (OPNAVINST 5510.48 provides the process for NUWC Division, Keyport's authorization to participate in multiple DEA's and IEP's.)

j. Interoperability Coordination with Foreign Navies. Under CNO direction, NUWC Division, Keyport has initiated liaison activities with allied navies to foster joint training and data gathering objectives in the underwater systems test area. These CNO-directed efforts are classified and include joint testing operations with allied navy platforms at Keyport-operated underwater range sites. (CNO letter dated 25 October 1993.)



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k. Continuous Acquisition and Life-Cycle Support (CALs). The CALS Shared Resource Center for the Pacific Northwest Region is located in close proximity to NUWC Division, Keyport to facilitate technology transfer. The principal mission of the CSRC is to transfer technical, industrial, and manufacturing technology to small and medium sized businesses in the region. This Division offers a variety of network access topologies for small business use. Engineering data systems, Computer Aided Design, and Electronic Commerce/Electronic Data Interchange resources are available as training resources and demonstrations of what can be done in an all digital environment. The vast computing capability at NUWC Division, Keyport will be leveraged to start-up new business in the region. (The Technical Proposal for the Pacific Northwest Regional CALS shared Resource Center was submitted by the Economic Development Council of Kitsap County on 4 March 1994.)

l. Divers Gages - U.S. Marine Corps. The Navy Calibration Laboratory at NUWC Division, Keyport has been tasked for each of the past six years to calibrate divers gages for U.S. Marine Corps Reserves, Company B, 4th Marine Recon Battalion, 4th Marine Division stationed in Billings, Montana. (Work Request #M1470094WR00108.)

m. Range Program - Data Collection System. NUWC Division, Keyport has been tasked by the Department of the Treasury, U.S. Customs Service, to develop a portable data collection system, provide training in the use of the system, and perform data reduction and analysis on the data collected by the system. (Funding Document 90N-1X930524.)

n. Reactor Compartment Escort. This is a joint U.S. Navy, U.S. Coast Guard, and Department of Energy mission. The reactor compartments from deactivated submarines are barged from Puget Sound Naval Shipyard, through Puget Sound, down the coast of Washington, and up the Columbia River to the Hanford Nuclear Reservation for final storage. This Division provides the "Gray Hull" escort with a U.S. Coast Guard observer. A 186-foot YTT 9 Class vessel is used for the open ocean portion and the 120-foot TWR 822 is used for the Columbia River portion. This critical function is performed to ensure the security of the classified barge cargo. (Funding Document N0025193WR30166.)

o. Diver Services. Several joint service agreements exist with NUWC Division, Keyport's U.S. Navy Diving Locker. A joint Drug Enforcement Agency and U.S. Army project is in place to support the War Against Drugs in the Pacific Northwest. (Funding Document W33BL0019XXXJ3.)

This Division is tasked to support the 1st Special Forces Group (Airborne) at Fort Lewis providing recompression chamber services, including training in medicine, physics, and procedures for recompression. (Department of the Army letter of 13 December 1993.)

p. Search and Rescue (SAR). NUWC Division, Keyport has an SAR agreement in



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support of the 13th Coast Guard District. This agreement sets forth 24-hour watchstanding requirements for U.S. Navy personnel and requires a response of one craft in 15 minutes and a second craft within one hour. (USCG letter of 12 June 1989.)

q. Digital Ice Profiling System for Arctic Ice Draft Data. The Digital Ice Profiling System is a joint project between this Division and Chief, Snow and Ice Branch, U.S. Army Cold Regions Research and Engineering Laboratory. This project's Arctic ice draft data is being collected during a submarine exercise in the Arctic as part of a statistical study being performed. Upon return of this and associated data to NUWC Detachment Arctic Submarine Laboratory, Detachment personnel will edit and transform this data into a form usable for this study. This data will be combined with data from previous Arctic cruises to look at trends in ice thickness distribution. (MIPR # CRREL 94-47 dated 6 January 1994.)



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## TECHNICAL FUNCTIONS

**3. Technical Functions Resource Allocations.** Appendix A provides a list of numbered functional support areas that cover the spectrum of naval warfare and support operations. Additionally, Appendix A provides a list of numbered life-cycle work areas that cover the "cradle to grave" spectrum of Navy systems acquisition. Utilizing the two lists at Appendix A, each activity will break out its entire FY1993 technical program within any applicable intersections of these two defining schemes (for example, functional support area #5.2 - life cycle work area #3 will identify the activity's level of resources allocated to sensors and surveillance systems, radar systems in advanced development). Definitions for each functional support and life cycle work area are provided in Appendix B for reference.

a. Use the form at Tab A of this data call to provide data on work years and expenditures for FY1993 to support each applicable intersection of functional support areas and life cycle work areas. When necessary, estimate data to the best of your ability

b. Similarly, use the Tab A forms to report separately on your detachments or sites that have not received this data call directly. This data may be consolidated when the detachments or sites perform work in the same area. When necessary, estimate data to the best of your ability.

Note: In-House Work Years includes both Defense Business Operations Fund (DBOF) funded and Non-DBOF funded military workyears.

**3.1 NUWC Technical Roles and Functional Responsibilities.** During the two years since the Naval Undersea Warfare Center was formed, significant mission purification has been accomplished, eliminating redundant capabilities, focusing scarce resources on core mission capabilities, and ensuring quality execution of the remaining functions. Commander, Naval Undersea Warfare Center has employed a continuous process of self-examination to evaluate past, present, and future mission roles and responsibilities, core technical capabilities, and opportunities for privatization of non-core work.

**3.2 Unmanned Undersea Vehicles and Mobile Targets.** Unmanned Undersea Vehicle and Mobile Target work has been included with Torpedoes (2.4) because of technological commonality and synergism.



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**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	2. Weapons Systems 2.2 Guided Missiles
Life Cycle Work Area	7. Production

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 11.0 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$1,134.2(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$33.5(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



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**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	2. Weapons Systems 2.4 Torpedoes
Life Cycle Work Area	4. Engineering and Manufacturing Development

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 30.6 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$5,268.9(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$1,256.9(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



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**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	2. Weapons Systems 2.4 Torpedoes
Life Cycle Work Area	7. Production

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 46.6 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$6,348.1(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$1,896.1(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



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FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	2. Weapons Systems 2.4 Torpedoes
Life Cycle Work Area	8. Acceptance Testing

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 265.3 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$14,151.0(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$4,844.1(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



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FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	2. Weapons Systems 2.4 Torpedoes
Life Cycle Work Area	10. Program Support

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 12.0 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$1,028.8(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$461.8(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



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FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	2. Weapons Systems 2.4 Torpedoes
Life Cycle Work Area	11. Maintenance

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 92.8 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$11,278.2(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$1,622.2(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-7

UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	2. Weapons Systems 2.4 Torpedoes
Life Cycle Work Area	12. Repair

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 556.9 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$67,483.0(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$9,501.9(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-8  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	2. Weapons Systems 2.4 Torpedoes
Life Cycle Work Area	13. Testing

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 190.0 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$11,590.9(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$2,799.5(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-9  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	2. Weapons Systems 2.4 Torpedoes
Life Cycle Work Area	14. In-Service Engineering

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 206.3 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$26,039.9(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$13,604.9(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-10  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	2. Weapons Systems 2.4 Torpedoes
Life Cycle Work Area	15. Program Support

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 46.3 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$4,310.5(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$1,388.0(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-11  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	2. Weapons Systems 2.5 Mines
Life Cycle Work Area	11. Maintenance

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 24.7 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$2,862.3(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$399.9(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-12  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	2. Weapons Systems 2.5 Mines
Life Cycle Work Area	12. Repair

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 9.8 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$1,130.0(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$117.7(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-13  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	2. Weapons Systems 2.5 Mines
Life Cycle Work Area	13. Testing

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 9.2 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$1029.9(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$60.8(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-14  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	2. Weapons Systems 2.5 Mines
Life Cycle Work Area	15. Program Support

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 7.1 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$804.4(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$73.2(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-15  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	2. Weapons Systems 2.9 Fire Control
Life Cycle Work Area	7. Production

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 10.3 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$1,222.1(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$70.9(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-16  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	2. Weapons Systems 2.9 Fire Control
Life Cycle Work Area	11. Maintenance

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 12.3 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$1,790.4(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$397.4(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-17  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	2. Weapons Systems 2.9 Fire Control
Life Cycle Work Area	12. Repair

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 41.8 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$5,745.2(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$1,149.2(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-18  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	2. Weapons Systems 2.9 Fire Control
Life Cycle Work Area	13. Testing

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 34.8 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$4,714.5(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$1,046.4(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-19  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	2. Weapons Systems 2.9 Fire Control
Life Cycle Work Area	14. In-Service Engineering

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 99.9 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$13,831.0(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$7,145.5(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$310.3(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-20  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	2. Weapons Systems 2.9 Fire Control
Life Cycle Work Area	15. Program Support

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 16.3 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$2,170.3(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$2,443.0(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-21  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	5. Sensors & Surveillance Systems 5.1 Sonar Systems
Life Cycle Work Area	7. Production

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 7.2 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$647.6(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$100.8(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-22  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	5. Sensors & Surveillance Systems 5.1 Sonar Systems
Life Cycle Work Area	11. Maintenance

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 11.8 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$1,704.5(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$621.2(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-23  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	5. Sensors & Surveillance Systems 5.1 Sonar Systems
Life Cycle Work Area	12. Repair

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 24.0 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$3,233.0(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$1,636.9(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-24  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	5. Sensors & Surveillance Systems 5.1 Sonar Systems
Life Cycle Work Area	13. Testing

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 22.5 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$3,167.6(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$753.6(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-25  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	5. Sensors & Surveillance Systems 5.1 Sonar Systems
Life Cycle Work Area	14. In-Service Engineering

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 33.7 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$3,092.5(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$774.3(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$560.9(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-26  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	5. Sensors & Surveillance Systems 5.1 Sonar Systems
Life Cycle Work Area	15. Program Support

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 5.0 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$644.9(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$149.5(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-27  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	7. Command, Control, Communications and Intelligence (C <sup>3</sup> I) 7.1 Submarine
Life Cycle Work Area	4. Engineering and Manufacturing Development

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 5.2 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$583.8(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$421.3(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-28  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	7. Command, Control, Communications and Intelligence (C <sup>3</sup> I) 7.1 Submarine
Life Cycle Work Area	14. In-Service Engineering

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 11.6 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$1,301.3(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$241.5(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-29  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	8. Defense Systems 8.2 Countermeasures
Life Cycle Work Area	4. Engineering and Manufacturing Development

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 5.7 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$642.4(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$390.0(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-30  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	8. Defense Systems 8.2 Countermeasures
Life Cycle Work Area	8. Acceptance Testing

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 38.1 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$4,595.1(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$131.9(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-31  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	8. Defense Systems 8.2 Countermeasures
Life Cycle Work Area	11. Maintenance

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 5.1 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$603.6(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$238.8(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-32  
UIC N00253  
NUWC DIV KEYPORT

## TECHNICAL FUNCTIONS

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	8. Defense Systems 8.2 Countermeasures
Life Cycle Work Area	12. Repair

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 5.9 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$725.0(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$507.5(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-33  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	8. Defense Systems 8.2 Countermeasures
Life Cycle Work Area	14. In-Service Engineering

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 9.9 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$1,215.0(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$2,798.6(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-34  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	8. Defense Systems 8.2 Countermeasures
Life Cycle Work Area	15. Program Support

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 5.6 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$681.9(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$373.1(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-35  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	10. General Mission Support 10.1 Personnel and Training 10.1.1 Submarine Related Training Systems
Life Cycle Work Area	17. Training/Operational Support

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 26.7 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$5,006.0(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$1,000.0(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-36  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	10. General Mission Support 10.2 Logistics Planning and Implementation
Life Cycle Work Area	7. Production

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 40.0 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$4,620.3(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$442.3(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-37  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	10. General Mission Support 10.3 Facilities Engineering
Life Cycle Work Area	11. Maintenance

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 20.6 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$1,908.2(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$1,794.2(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-38  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	10. General Mission Support 10.4 Diving, Salvage, and Ocean Engineering
Life Cycle Work Area	8. Acceptance Testing

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 10.4 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$0(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$0(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-39  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	10. General Mission Support 10.4 Diving, Salvage, and Ocean Engineering
Life Cycle Work Area	13. Testing

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 6.6 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$0(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$0(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$7.3(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-40  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	10. General Mission Support 10.7 Major Range Development and Operation
Life Cycle Work Area	9. Modernization

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 45.1 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$4,657.5(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$1,387.5(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-41  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	10. General Mission Support 10.7 Major Range Development and Operation
Life Cycle Work Area	11. Maintenance

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 41.7 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$3,397.6(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$1,012.1(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-42  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	10. General Mission Support 10.7 Major Range Development and Operation
Life Cycle Work Area	13. Testing

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 79.8 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$6,459.8(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$1,965.4(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-43  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	10. General Mission Support 10.7 Major Range Development and Operation
Life Cycle Work Area	14. In-Service Engineering

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 12.3 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$1,270.2(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$378.4(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-44  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	10. General Mission Support 10.7 Major Range Development and Operation
Life Cycle Work Area	15. Program Support

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 9.1 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$939.0(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$280.0(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-45  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	10. General Mission Support 10.9 Activity Mission and Function Support
Life Cycle Work Area	7. Production

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.4 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$170.6(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$0(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
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UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	10. General Mission Support 10.9 Activity Mission and Function Support
Life Cycle Work Area	11. Maintenance

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 3.0 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$1,137.4(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$0(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
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UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Functional Support Area	10. General Mission Support 10.9 Activity Mission and Function Support
Life Cycle Work Area	15. Program Support

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 42.3 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$8,040.6(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$3,649.9(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-48  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NAVUNSEAWARCEN Fleet Operational Support Detachment
Functional Support Area	2. Weapons Systems 2.4 Torpedoes
Life Cycle Work Area	11. Maintenance

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 3.2 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$421.5(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$83.8(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-49  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NAVUNSEAWARCEN Fleet Operational Support Detachment
Functional Support Area	2. Weapons Systems 2.4 Torpedoes
Life Cycle Work Area	13. Testing

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 5.8 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$761.9(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$543.8(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
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NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NAVUNSEAWARCEN Fleet Operational Support Detachment
Functional Support Area	2. Weapons Systems 2.9 Fire Control
Life Cycle Work Area	13. Testing

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 48.1 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$6,508.6(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$1,764.9(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-51  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NAVUNSEAWARCEN Fleet Operational Support Detachment
Functional Support Area	5. Sensors and Surveillance Systems 5.1 Sonar Systems
Life Cycle Work Area	13. Testing

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 33.4 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$4,594.4(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$1,090.3(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-52  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NAVUNSEAWARCEN Fleet Operational Support Detachment
Functional Support Area	10. General Mission Support 10.1 Personnel and Training 10.1.4 Weapons Related Training Systems
Life Cycle Work Area	17. Training/Operational Support

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 14.2 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$2,052.2(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$460.1(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-53  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NAVUNSEAWARCEN Fleet Operational Support Detachment
Functional Support Area	10. General Mission Support 10.7 Major Range Development and Operation
Life Cycle Work Area	11. Maintenance

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 15.0 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$1,549.0(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$461.5(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-54  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NAVUNSEAWARCEN Fleet Operational Support Detachment
Functional Support Area	10. General Mission Support 10.7 Major Range Development and Operation
Life Cycle Work Area	13. Testing

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 37.2 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$4,300.5(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$1,107.4(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-55  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Detachment Hawthorne, Hawthorne, NV
Functional Support Area	2. Weapons Systems 2.5 Mines
Life Cycle Work Area	11. Maintenance

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 8.2 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$745.9(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$34.3(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-56  
UIC N00253  
NUWC DIV KEYPORT

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NUWC Detachment Hawthorne, Hawthorne, NV
Functional Support Area	2. Weapons Systems 2.5 Mines
Life Cycle Work Area	12. Repair

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 7.4 WYs

2. **Expenditures.**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$755.4(K)

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 for this functional support area - life cycle work area. **Do not** include direct cite funding. \$55.2(K)

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$0(K)

Note:

In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DOD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
3-57  
UIC N00253  
NUWC DIV KEYPORT

## MANPOWER

### 4. Work Breakdown Structure.

a. Use Table 4.1 (below) to provide data on the general support functions at your activity. Report data as of 31 March 1994. If you are collocated with one of your subordinate base keeper commands (i.e., a NAWS or NAS collocated with a NAWC Division), describe the differences in the functions of each and provide a separate Table 4.1 for the subordinate command. Include this command in the Table 4.1 submission for your Activity.

b. Similarly, use Table 4.2 (below) to provide general support function data for all your detachments or sites that did not receive this data call directly. Consolidate data from all of these detachments into one table (4.2). Provide a list of the detachments whose data is included in Table 4.2. For each identified detachment in this list, include its name, location, UIC, and number of civilian and military personnel onboard.

In addition, if any of your detachments or separate sites not receiving an individual data call have over 50 civilian personnel or own technical facilities, provide separately a description of the site, the functions performed there, photographs showing the facilities and state the reason for that site's existence and the necessity for it to be at that location.

c. Use Table 4.3 (below) to provide estimated data, for your activity only, to reflect the anticipated impact of previous BRAC decisions that have not yet been implemented. This data should provide the deltas from Table 4.1.

### NOTES:

[1] Use the following definitions when providing data for the tables below:

Workyears: Consistent with those used in the preparation of inputs to the President's budget.

Contract Workyears: Actual or estimated workyears performed by support contractors with workyears defined consistent with the definition used in the President's budget.

Civilian Personnel Onboard: Full Time Permanent (FTP) employees.

[2] Any categories of personnel that are employed to support other Activities should be noted with the name of the additional Activity supported.



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UIC N00253

NUWC DIV KEYPORT

**Table 4.1, General Support Resources for  
(Activity: NUWC Division, Keyport ) (UIC: N00253 )**

Function	Space Allocated (Gross SQFT)	Work Years	Civilian Personnel Onboard	Contract Work Years	Military Personnel Onboard	
					Off	Enl
<b>ADMINISTRATION</b>						
Command (CO/XO/TD/etc.)	6,770	31	31	10	2	0
Comptroller	3,450	45	45	14	0	0
Admin	3,130	47	47	4	0	0
Human Resources	5,070	35	35	4	0	0
<b>OPERATIONS SUPPORT</b>						
Supply Management	13,930	87	87	86	1	0
Consolidated Computational Computer Support	9,070	23	23	7	0	0
Information Systems and Communications	8,400	60	60	50	0	0
Safety/OSH/Environmental	3,520	31	31	14	0	0
<b>INFRASTRUCTURE</b>						
Physical Security	4,240	31	31	0	2	1
Public Works/Staff Civil Engr	5,040	41	41	86	1	0
Fire Protection	3,410	13	13	0	0	0
Medical/Dental	2,680	0	0	0	0	0
Military Support	2,510	0	0	0	0	35
Air/Waterfront Operations	0	0	0	0	0	0
Other	0	0	0	0	0	0
<b>TECHNICAL STAFF</b>						
Technical Operations			2,251	850	8	224
Totals	2,161,622	2,777	2,695	1,125	14	260



**ADMINISTRATIVE SENSITIVE**

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4-2  
UIC N00253  
NUWC DIV KEYPORT

**Table 4.2, General Support Resources for all Detachments  
(Activity: NUWC Division, Keyport ) (UIC: N00253 )**

Function	Space Allocated (Gross SQFT)	Work Years	Civilian Personnel Onboard	Contract Work Years	Military Personnel Onboard	
					Off	Enl
<b>ADMINISTRATION</b>						
Command (CO/ XO/ TD/etc.)	1,983	7	7	0	3	0
Comptroller	0	0	0	0	0	0
Admin	7,522	28	28	6	0	0
Human Resources	0	0	0	0	0	0
<b>OPERATIONS SUPPORT</b>						
Supply Management	0	0	0	0	0	0
Consolidated Computational Computer Support	0	0	0	0	0	0
Information Systems and Communications	0	0	0	0	0	0
Safety/OSH/Environmental	0	0	0	0	0	0
<b>INFRASTRUCTURE</b>						
Physical Security	0	0	0	0	0	0
Public Works/Staff Civil Engr	0	0	0	0	0	0
Fire Protection	0	0	0	0	0	0
Medical/Dental	0	0	0	0	0	0
Military Support	0	0	0	0	0	0
Air/Waterfront Operations	0	0	0	0	0	0
Other	0	0	0	0	0	0
<b>TECHNICAL STAFF</b>						
Technical Operations			154	36	0	0
<b>Totals</b>	636,999	234	189	42	3	0



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Detachment Listings for data included in Table 4.2

<u>Name/Location/UIC</u>	<u>Civilian Personnel</u>	<u>Military Personnel</u>
NUWC Detachment Hawthorne Hawthorne, NV UIC N41869	15	1
NUWC Detachment Hawaii Lualualei, HI UIC N35266	120	1
NUWC Detachment San Diego San Diego, CA UIC N42039	33	0
NUWC Detachment Arctic Submarine Laboratory San Diego, CA UIC N68951	21	1
Totals	189	3



**ADMINISTRATIVE SENSITIVE**

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4-4

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NUWC DIV KEYPORT

NUWC Division, Keyport Detachment Descriptions  
Fleet Operational Support Department

**SITE**

The Fleet Operational Support Department is comprised of three separate sites. They are the Hawaii Detachment (UIC N35266), the Arctic Submarine Laboratory Detachment (UIC N41869), and the San Diego Detachment (UIC N42039) - located in two geographical areas (Hawaii and San Diego). The Hawaii Detachment is located on the island of Oahu with an additional worksite on Kauai. It consists of 126,800 square feet of office, work, and storage spaces. The Oahu operation is a tenant of the Naval Magazine, Lualualei, while the Kauai site operates as a tenant of the Pacific Missile Range Facility (PMRF). Four unique fixed test facilities are part of the Hawaii Detachment: the Fleet Operational Readiness Check Site III, the Hawaii Island Underwater Range, the Shipboard Electronic Systems Evaluation Facility, and the Acoustic Test Facility. The Arctic Submarine Laboratory Detachment is located in San Diego, California. It occupies approximately 49,000 square feet of work, office, and storage space as a tenant activity of Naval Command and Control and Ocean Surveillance Center. The San Diego Detachment is located in San Diego, California. It occupies approximately 20,000 square feet of work, office, and storage space at the Balboa San Diego site, and 23,000 square feet as a tenant activity of Naval Air Station, North Island. Three unique fixed test facilities are part of the San Diego Detachment: the Fleet Operational Readiness Check Site I, the San Clemente Island Underwater Range, and the Shipboard Electronic Systems Evaluation Facility, Point Loma.

**FUNCTION**

The Fleet Operational Support Department provides on-site undersea warfare test and evaluation and Fleet support for NUWC/NAVSEA in the Fleet-concentrated areas of Hawaii and San Diego. This organic waterfront undersea warfare technical expertise is also utilized by the acquisition system managers (i.e., the AEGIS program manager (PMS-400)), Foreign Military Sales customers, and the operational forces. The Hawaii Detachment serves as the main headquarters of the Fleet Operational Support Department in providing centralized management of administrative responsibilities supporting all three operating sites.

In support of the Fleet from its Hawaii operating sites, the Fleet Operational Support Department administers the surface, submarine, and air combat systems, undersea warfare (USW) and antisubmarine warfare test (ASW) and analysis programs in Hawaii; provides range support resources, tracking instrumentation, ASW mobile targets, and USW and ASW weapon training vehicles for Fleet and NAVSEA operations on the Hawaiian PACMISLANFAC range; operates and maintains the NAVSEA calibration Fleet Operational



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Readiness Accuracy Check Site III (FORACS) at Nanakuli, the 3-D instrumented underwater range (HAIUR), and the Shipboard Electronics Systems Evaluations Facility at Barbers Point; provides Intermediate Maintenance Activity facilities for ASW mobile targets, tracking instrumentation, and USW/ASW weapon training vehicles; operates and maintains the Surface Ship Radiated Noise Measurement site; functions as a COMOPTEVFOR trusted agent for USW systems testing; functions as PMS-400's ASW coordinator for AEGIS Combat Systems Ship Qualification Trials; functions as NAVSEA Technical Design Agent for the Post-operational Analysis Critique and Exercise Review (PACER) program; and provides ancillary engineering, technical, logistic, and facility services for undersea, surface, and air warfare research, development, test, and evaluation efforts in the Hawaiian area.

In support of the Fleet from its San Diego operating sites, the Fleet Operational Support Department administers the surface, submarine, and air combat systems, undersea warfare (USW) and antisubmarine warfare test (ASW) and analysis programs in the Southern California area; provides range support resources, tracking instrumentation, ASW mobile targets, and USW and ASW weapon training vehicles for Fleet and NAVSEA operations on the Submarine Combat System Operational Readiness Evaluation range; operates and maintains the NAVSEA calibration Fleet Operational Readiness Accuracy Check Site I (FORACS) on San Clemente Island, the 3-D Instrumented Underwater Range (SCIUR), and the Shipboard Electronics Systems Evaluations Facility; provides Intermediate Maintenance Activity facilities for ASW mobile targets, tracking instrumentation, and USW/ASW weapon training vehicles; operates and maintains the Surface Ship Radiated Noise Measurement site; and provides ancillary engineering, technical, logistic, and facility services for undersea, surface, and air warfare research, development, test, and evaluation efforts in the Hawaiian area.

The Arctic Submarine Laboratory Detachment site coordinates and supports arctic operations and field experiments, and compiles knowledge which continues to develop the maximum capability of submarines to operate and exploit all ice-covered areas during all seasons. It supports others in research to obtain basic knowledge of ocean-cryology and conducts geophysical studies in the Arctic Ocean and environments significant to arctic naval warfare. Technical support is provided to the Fleet in the conduct of submarine arctic operations, tests, and evaluations. The Officer In Charge of the Fleet Operational Support Department is additionally in charge of the Arctic Submarine Laboratory (ASL), and serves as an advisor to the Submarine Force Commanders, Atlantic and Pacific Fleets, to provide advice and technical support, as required by the Force Commanders, and to conduct submarine operations. The Officer In Charge is the Navy's submarine Arctic expert. ASL is the focal point in the Navy for all submarine-related Arctic operations.



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UIC N00253

NUWC DIV KEYPORT

## **Facility Pictorial**

See attached photos.

## **Detachment site existence and location justification**

The Fleet Operational Support Department is strategically located in the two areas (Hawaii and San Diego) of major Fleet concentration. Colocated in these areas are the two major Fleet training ranges (PMRF/SCORE). The Department is an integral portion of the major Fleet training range efforts. If the Fleet Operational Support Department, with its organic core test and evaluation and Fleet support capability were not in existence at these locations, the required NAVSEA/NUWC/Fleet support would have to be provided remotely at increased cost or would not be available and Fleet readiness in USW mission areas would rapidly decline. In addition, the ASL Technical Ice Pilots are the premier experts on Arctic submarine operations and represent the corporate knowledge and experience for the Fleet. If this vital expertise were not available, Navy submarines would operate at risk in the Arctic Ocean.



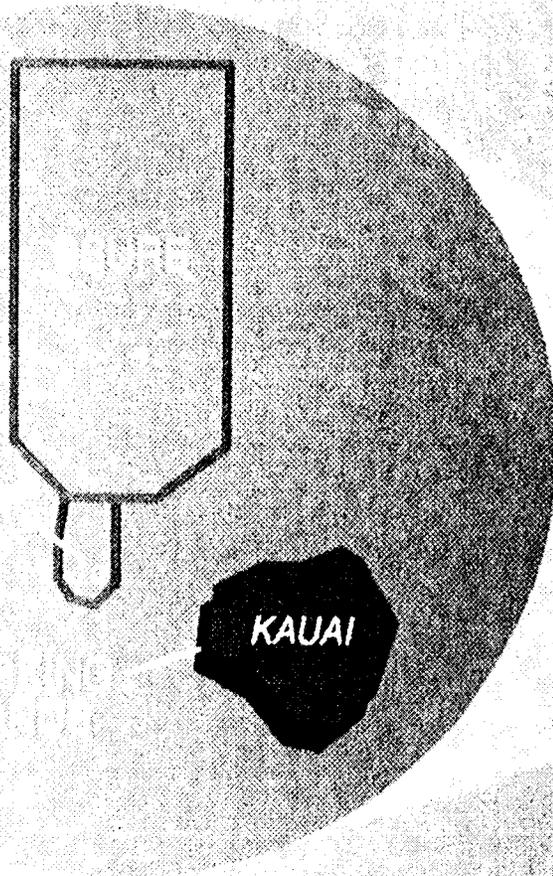
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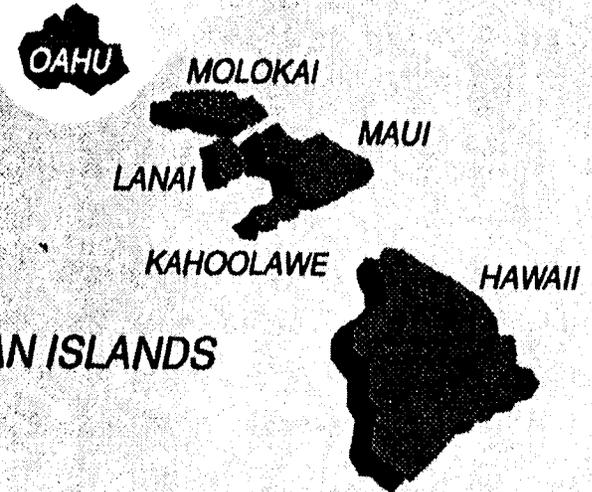
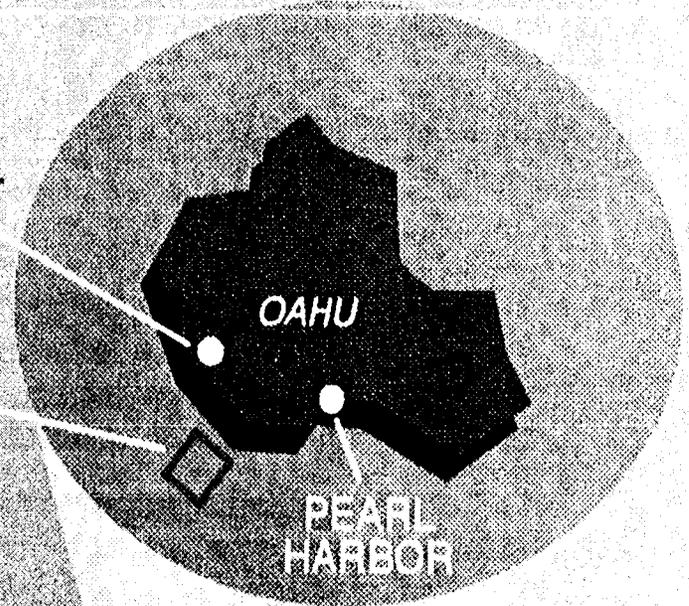
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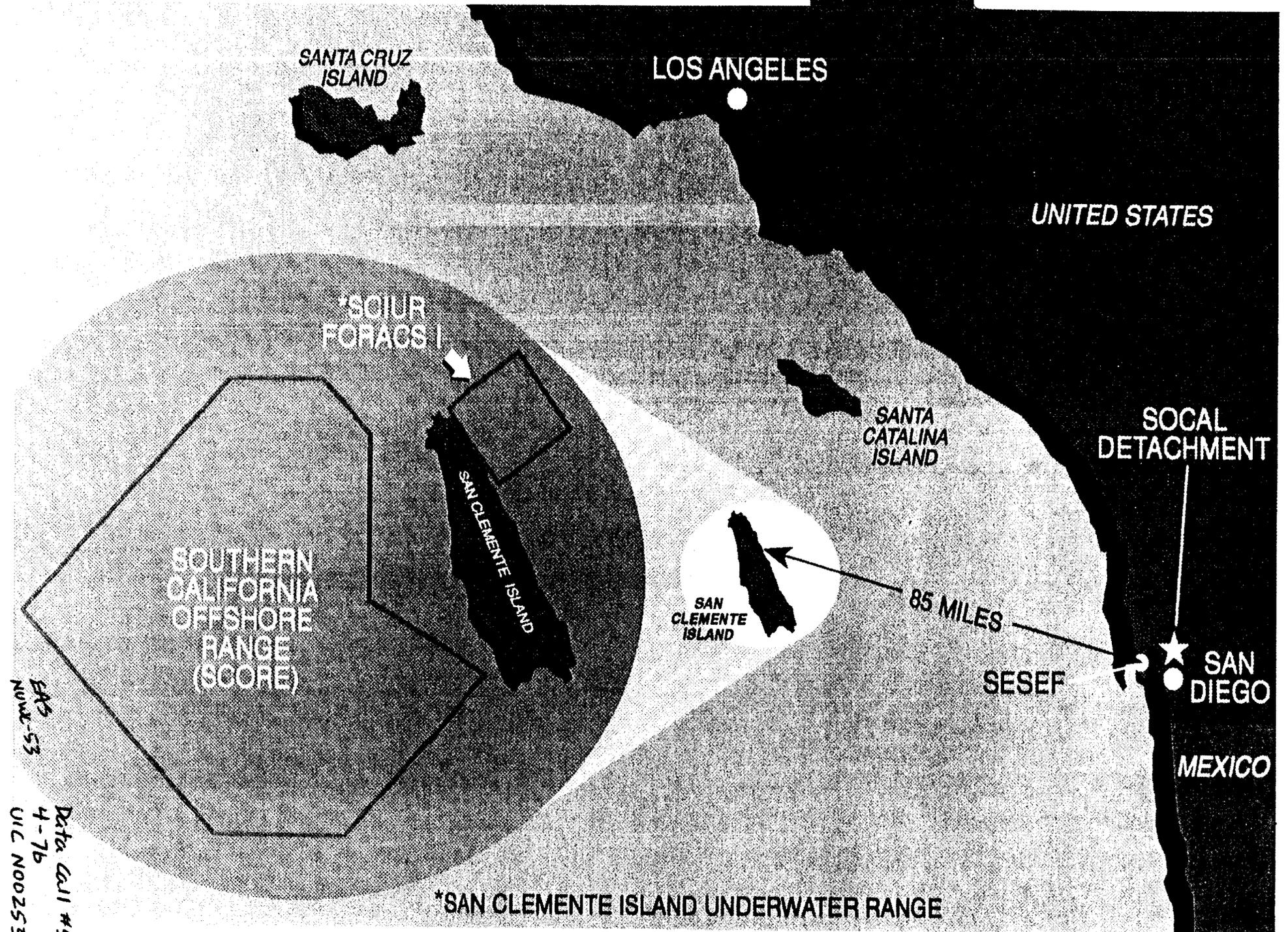
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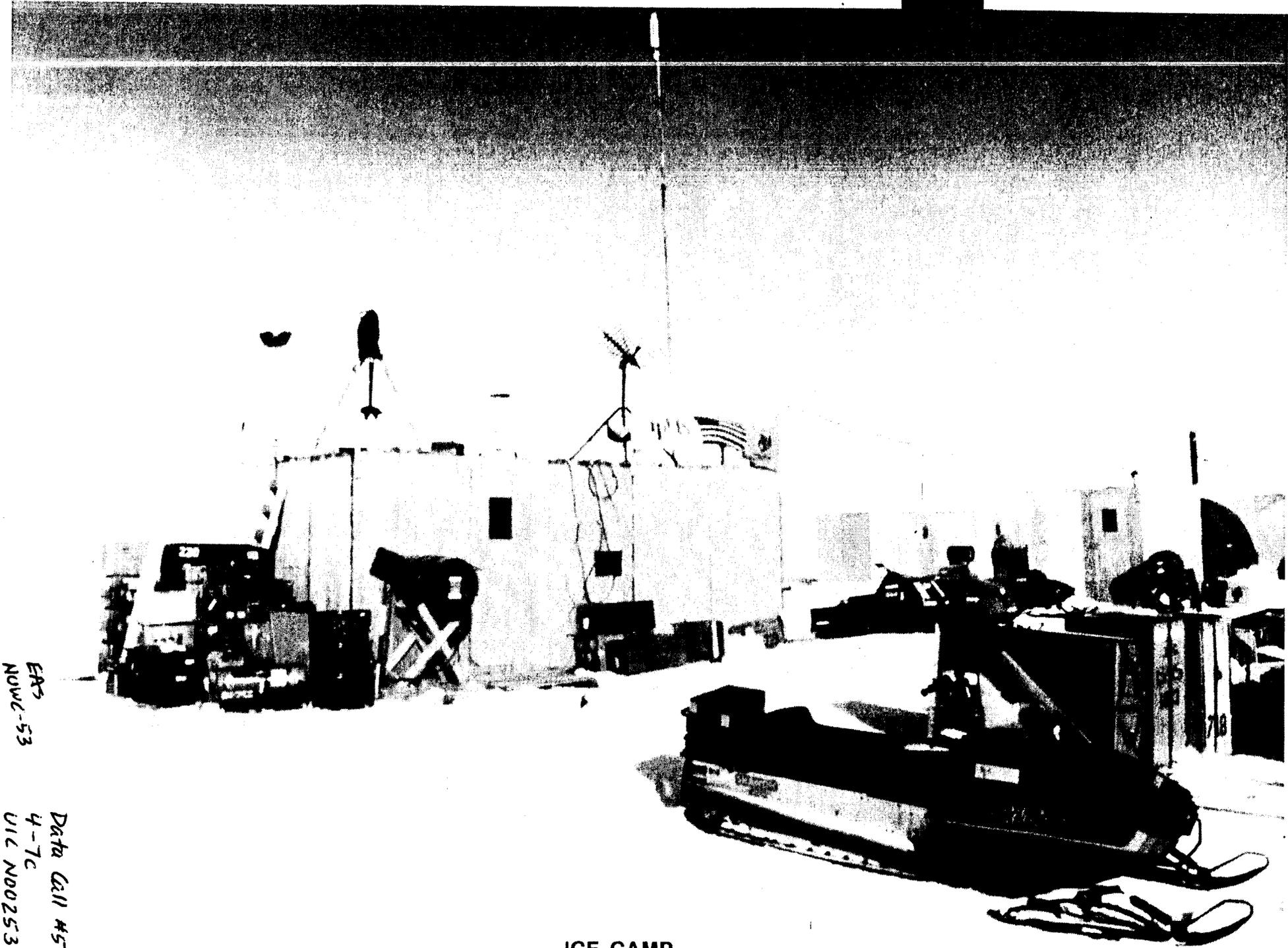


HAWAIIAN ISLANDS

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VIC NO0253

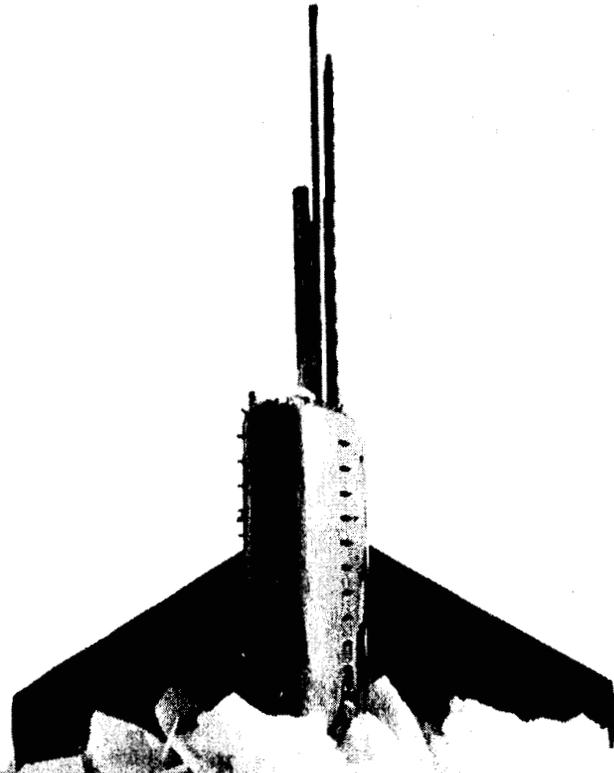




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4-7c  
UIC N00253

ICE CAMP



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NUWC-53

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UIC N00253

SUBMARINE SURFACING AT ARCTIC

NUWC Division, Keyport Detachment Descriptions  
NUWC Detachment Hawthorne  
UIC N41869

**SITE**

The Hawthorne Detachment is located in the state of Nevada as a tenant activity on the Hawthorne Army Ammunition Plant. The Detachment occupies approximately 425,000 square feet of building space on 12 acres of land. Included in the Detachment's facilities are explosive magazines, storage buildings, explosive and inert operating buildings, and flammable storage buildings.

**FUNCTION**

The Hawthorne Detachment operates Mine Maintenance facilities and performs intermediate and depot level maintenance, modification, breakdown, declassification, assembly testing, and preparation of mines for stock and issue. It performs renovation, breakdown, assembly, and testing of torpedo components; performs cyclic inspection of equipment assigned to the Hawthorne Detachment; and maintains pyrotechnics, initiators, boosters, and other related explosives utilized in mine and torpedo programs. Furthermore, the Detachment maintains basic mine and component stocks and provides release and movement orders as required; performs packaging and preservation of all types of mines and related components; initiates or performs testing of mines and components assembled, modified, altered, and issued by the Detachment; and maintains all gauges, scales, and other specialized test equipment required for mine inspection and maintenance operations.

**Facility Pictorial**

See attached photos

**Detachment site existence and location justification**

The Hawthorne Detachment is located in a climate that is ideally suited for the utilization of outside storage, since this area only receives approximately three inches of rain per year. This allows economical and safe outside storage of various mine hardware and other inert ordnance hardware. The Hawthorne Detachment is the Navy's only Mine Depot.



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NUWC DIVISION, KEYPORT

HAWTHORNE NAVY MINE DEPOT

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NOWC63

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UIC N00253

**Table 4.3, Previous BRAC Impact to General Support Resources for  
(Activity: NUWC Division, Keyport ) (UIC: N00253 )**

Function	Space Allocated (Gross SQFT)	Work Years	Civilian Personnel Onboard	Contract Work Years	Military Personnel Onboard	
					Off	Enl
<b>ADMINISTRATION</b>						
Command (CO/ XO/ TD/etc.)	0	0	0	0	0	0
Comptroller	0	0	0	0	0	0
Admin	0	0	0	0	0	0
Human Resources	0	0	0	0	0	0
<b>OPERATIONS SUPPORT</b>						
Supply Management	0	0	0	0	0	0
Consolidated Computational Computer Support	0	0	0	0	0	0
Information Systems and Communications	0	0	0	0	0	0
Safety/OSH/Environmental	0	0	0	0	0	0
<b>INFRASTRUCTURE</b>						
Physical Security	0	0	0	0	0	0
Public Works/Staff Civil Engr	0	0	0	0	0	0
Fire Protection	0	0	0	0	0	0
Medical/Dental	0	0	0	0	0	0
Military Support	0	0	0	0	0	0
Air/Waterfront Operations	0	0	0	0	0	0
Other	0	0	0	0	0	0
<b>TECHNICAL STAFF</b>						
Technical Operations			0	0	0	0
Totals	0	0	0	0	0	0



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**5. Technical Staff Qualifications.**

a. Use Table 5.1 (below) to provide data on the civilian personnel allocated to Technical Operations having the educational and experience levels indicated in the table for your activity. Report data as of 31 March 1994. Similarly, use Table 5.2 (below) to provide data for all your separate detachments or sites that did not receive this data call directly. Consolidate data from all of these detachments into one table (5.2). Provide a list of the detachments whose data is included in Table 5.2.

Table 5.1, Technical Staff Education Level for  
(Activity: **NUWC Division, Keyport**) (UIC: **N00253**)

Highest Degree Attained	Years of Government and/or Military Service					Total
	Less than 3 Years	3-10 Years	11-15 Years	16-20 Years	More than 20 Years	
Grade School	0	0	0	0	0	0
High School/ Equivalent	1	128	203	231	354	917
1-4 Years College No Degree	1	26	47	52	85	211
Associate Degree	0	44	84	105	169	402
B.A./B.S	9	187	162	78	168	604
M.A./M.S	0	23	24	15	50	112
Ph.D./ M.D.	0	1	1	1	2	5
<b>Total</b>	<b>11</b>	<b>409</b>	<b>521</b>	<b>482</b>	<b>828</b>	<b>2,251</b>



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Table 5.2, Technical Staff Education Level for all Detachments  
 (Parent Activity: NUWC Division, Keyport ) (UIC: N00253 )

Highest Degree Attained	Years of Government and/or Military Service					Total
	Less than 3 Years	3-10 Years	11-15 Years	16-20 Years	More than 20 Years	
Grade School	0	0	0	0	0	0
High School/ Equivalent	0	4	4	2	9	19
1-4 Years College No Degree	0	2	1	1	2	6
Associate Degree	0	1	5	1	3	10
B.A./B.S	0	33	27	14	35	109
M.A./M.S	0	1	0	2	4	7
Ph.D./ M.D.	0	1	1	0	1	3
<b>Total</b>	<b>0</b>	<b>42</b>	<b>38</b>	<b>20</b>	<b>54</b>	<b>154</b>

Detachment Listings for data included in Table 5.2

Name/Location/UIC

NUWC Detachment Hawthorne  
 Hawthorne, NV  
 UIC N41869

Name/Location/UIC

NUWC Detachment San Diego  
 San Diego, CA  
 UIC N42039

NUWC Detachment Hawaii

Lualualei, HI  
 UIC N35266

NUWC Detachment Arctic Submarine Laboratory

San Diego, CA  
 UIC N68951



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UIC N00253

NUWC DIV KEYPORT

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b. Use Table 5.3 (below) to provide data on the number of civil Technical Operations with graduate degrees and at least three years have their highest degree in the fields indicated. Report data as of 3 Table 5.4 (below) to provide data for all your separate detachments this data call directly. Consolidate data from all of these detachment Provide a list of the detachments whose data is included in Table 5.4

Personnel allocated to scale experience that in 1994. Similarly, use that did not receive ne table (5.4).

Table 5.3, Technical Staff Academic Fields for (Activity: NUWC Division, Keyport ) (UIC: N00253 )

Academic field	Num
Physics	
Chemistry	
Biology	0
Mathematics/Statistics/ Operations Research	5
Engineering	8
Medical	0
Dental	0
Computer Science	1
Social Science	1
Other Science	3
Non-Science	37
<b>Total</b>	<b>117</b>

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UIC N00253  
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b. Use Table 5.3 (below) to provide data on the number of civilian personnel allocated to Technical Operations with graduate degrees and at least three years of applicable experience that have their highest degree in the fields indicated. Report data as of 31 March 1994. Similarly, use Table 5.4 (below) to provide data for all your separate detachments or sites that did not receive this data call directly. Consolidate data from all of these detachments into one table (5.4). Provide a list of the detachments whose data is included in Table 5.4.

Table 5.3, Technical Staff Academic Fields for  
 (Activity: **NUWC Division, Keyport** ) (UIC: **N00253** )

Academic field	Number
Physics	28
Chemistry	3
Biology	7
Mathematics/Statistics/ Operations Research	21
Engineering	478
Medical	0
Dental	0
Computer Science	7
Social Science	8
Other Science	22
Non-Science	147
<b>Total</b>	<b>721</b>



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Table 5.4, Technical Staff Academic Fields for all Detachments  
(Parent Activity: NUWC Division, Keyport ) (UIC: N00253 )

Academic field	Number
Physics	2
Chemistry	0
Biology	0
Mathematics/Statistics/ Operations Research	0
Engineering	2
Medical	0
Dental	0
Computer Science	0
Social Science	0
Other Science	3
Non-Science	3
<b>Total</b>	<b>10</b>

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Detachment Listings for data included in Table 5.4

Name/Location/UIC  
NUWC Detachment Hawthorne  
Hawthorne, NV  
UIC N41869

Name/Location/UIC  
NUWC Detachment San Diego  
San Diego, CA  
UIC N42039

NUWC Detachment Hawaii  
Lualualei, HI  
UIC N35266

NUWC Detachment Arctic Submarine Laboratory  
San Diego, CA  
UIC N68951



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Table 5.4, Technical Staff Academic Fields for all Detachments  
 (Parent Activity: **NUWC Division, Keyport** ) (UIC: **N00253** )

Academic field	Number
Physics	5
Chemistry	0
Biology	0
Mathematics/Statistics/ Operations Research	4
Engineering	93
Medical	0
Dental	0
Computer Science	0
Social Science	1
Other Science	4
Non-Science	12
<b>Total</b>	<b>119</b>

Detachment Listings for data included in Table 5.4

Name/Location/UIC

NUWC Detachment Hawthorne  
 Hawthorne, NV  
 UIC N41869

NUWC Detachment Hawaii  
 Lualualei, HI  
 UIC N35266

NUWC Detachment Arctic Submarine Laboratory  
 San Diego, CA  
 UIC N68951

Name/Location/UIC

NUWC Detachment San Diego  
 San Diego, CA  
 UIC N42039



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c. Are there unique aspects of the activity's location that help or hinder in the hiring of qualified personnel?

Located on the pristine waters of the Puget Sound approximately 9 miles north of Bremerton, Washington, NUWC Division, Keyport is situated in a very desirable area to work and live. The Puget Sound is renowned for its excellent boating, sailing, and fishing, and two nearby national parks, Olympic and Mount Rainier, offer hiking, backpacking, mountain climbing, mountain biking, skiing, and other popular recreational activities. Fully complementing the quiet environment of Keyport, Seattle abounds with cultural, social, and professional sports activities and is only a pleasant one hour commute away. Seattle also has some of the nation's finest specialty hospitals, such as Fred Hutchinson Cancer Center, Children's Hospital, and Virginia Mason Clinic, which complement numerous other medical facilities in the area.

In 1990, the editors of Money Magazine selected the Bremerton metropolitan area in which NUWC Division, Keyport resides as "America's Most Liveable City." With this area's blend of high quality living, an abundance of diverse recreational opportunities, the availability of affordable housing, and a good professional, technical, and skilled trades job market, NUWC Division, Keyport is very well situated to attract highly qualified personnel of all types. Numerous educational facilities in the immediate area, including the University of Washington, Pacific Lutheran University, Seattle University, Olympic College, Chapman University, Indiana University, and several business/vocational colleges, provide both a ready source of new talent and continuing education opportunities for this Division's employees.

Nearby in this Navy community are the Naval Submarine Base, Bangor and the Puget Sound Naval Shipyard. These activities complement Keyport and each other by bringing Naval personnel to the area aboard ships and submarines who are highly trained and skilled in current antisubmarine and undersea warfare systems. Because of the quality of life in this area, many of these personnel remain or return after their active duty service is complete. This provides a continual source of mission-related technical skills and Fleet experience to the local job market, which really helps this Division and its supporting contractors.

NUWC Division, Keyport is easily accessible by air, rail, water, and highways. SEATAC International Airport, south of Seattle, is served by most major domestic and international air carriers, and north-south and east-west interstate highways are nearby. Major civilian port facilities are in close proximity at Seattle, Tacoma, Everett, Bellingham, and Anacortes.

All of these location factors combine in a synergistic fashion with NUWC Division, Keyport's reputation for being a world-class organization--one which exemplifies the vision of the Vice President's National Performance Review. That reputation was further enhanced by this Division's receipt of the 1994 National Quality Improvement Prototype Award. The synergy



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of a desirable location and an award-winning quality organization provides a real asset in attracting and hiring highly qualified personnel.

d. List all articles written by the in-house technical staff that were published or accepted for publication in refereed journals since 1 January 1990.

1. "Low-Cost Configuration Management Using a Personal Computer with Micro-ISEA," NAVSEA/NAVSUP International Logistics Symposium Proceedings Book, 1994.
2. "SCICEX-93: Arctic Cruise of the U.S. Navy Nuclear Powered Submarine USS PARGO," Marine Technology Society Journal, Vol 27, Number 4, 1993.
3. "Design of Mismatched Filters for Pulse Compression in a Multiple User Sonar Ranging System," Asilomar Signals/Systems/Computer Proceedings, 1993.
4. "Outfitting YTT-9 Class for Bottom Recovery/Salvage," Intervention Proceedings, 1993.
5. "Operations of High Frequency Sonar in the Arctic (U)," U.S. Navy Journal of Underwater Acoustics, Vol XL, 1992.
6. "Introduction to the U.S. Navy Arctic Laboratory," PROCEEDINGS of the 11th International Conference on Offshore Mechanics and Arctic Engineering, Vol. IV, 1992.
7. "Fracture of the First-Year Sea Ice; Preliminary Results," PROCEEDINGS of the 11th International Conference on Offshore Mechanics and Arctic Engineering, Vol. IV, 1992.
8. "Submarine Combat in the Ice," U.S. Naval Institute PROCEEDINGS, February 1992.
9. "Electrical Multiport Transfer Functions and Efficiency in Layered Media of Piezo-Electric and/or Non-Piezo-Electric Materials," JASA, 1991.
10. "CHAIN Matrix Model for an Acoustically Coupled, Lead Zirconate Titanate Core, Electrical Transformer," JASA, 1991.
11. "Commonality of Systems for Operation, Maintenance, and Training," Intervention Proceedings, 1991.
12. "A Versatile Integrated Acoustic Beamforming System," IEEE Pacific Rim Communications, Computer, and Signal Processing Proceedings, 1991.



**ADMINISTRATIVE SENSITIVE**

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13. "Superconductivity," The Physics Teacher, 1990.

14. "Submerged Object Recovery Device (SORDE); a Surface-Motivated Salvage Vehicle for Digging at Ocean Depths," Intervention Proceedings, 1990.

e. List all technical books and/or chapters written by the in-house technical staff that were published or accepted for publication since 1 January 1990.

n/a

f. Identify any Nobel laureates employed at this activity.

n/a

g. List all non-governmental awards for research or technical excellence given to members of your technical staff since 1 January 1990.

- 1994 - Community Economic Development Award presented by the Economic Development Council of Kitsap County for significant contributions to regional technical diversification.
- 1993 - American Defense Preparedness Association Bushnell Award for outstanding technical contributions to defense preparedness in the field of Undersea Warfare.
- 1993 - American Defense Preparedness Association Bronze Medal Award for outstanding work in the field of Measurement and Analysis of Undersea Vehicle Noise and Vibration.
- 1992 - American Defense Preparedness Association Bronze Medal Award in recognition of Scientific and Engineering Achievement in the field of Undersea Warfare.
- 1992 - Kitsap County Industrial Recycling Award for accomplishments in reducing solid waste generation.

h. List all governmental awards for research or technical excellence given to members of your technical staff since 1 January 1990.

NUWC Division, Keyport's long history of attention to quality is illustrated by the major recognition and awards that have been received in recent years, including the following:

- 1994 - National Quality Improvement Prototype Award. In announcing this year's three



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winners, Michele Hunt, Director of the Federal Quality Institute said, "These organizations are among the very best in government. They exemplify the vision of the Vice President's National Performance Review--a government that works better and costs less. The employees in these defense centers are demonstrating what a customer-centered government can do when there is a strong shared vision and commitment to excellence throughout the organization." During a recent ceremony recognizing NUWC Division, Keyport's achievement, the Honorable John H. Dalton, Secretary of the Navy, said, "You were the only Navy applicant selected as a 1994 finalist. Your selection as a Winner for a first time applicant is unusual in the history of this award and is a credit to your people...the men and women who made this happen, both civilian and military...I congratulate you on a job extremely well done and an award that is very well deserved!"

- 1994 - RADM William S. Parsons Award for scientific and technical progress in the field of Arctic Naval Warfare.
- 1994 - Secretary of the Navy Pollution Prevention Team Award in recognition of outstanding achievement in pollution prevention.
- 1994 - Navy Meritorious Civilian Service Award for outstanding leadership in directing the Total Quality Program.
- 1994 - Navy Meritorious Civilian Service Award for outstanding service and leadership in support of the Range Program.
- 1993 - The first-ever Secretary of the Navy Meritorious Unit Commendation for Environmental Achievement. All civilian and military personnel shared in this commendation and were awarded a pin or military ribbon in recognition of their achievement.
- 1993 - Runner-up for the Secretary of the Navy Pollution Prevention and Recycling Award.
- 1993 - Navy Meritorious Civilian Service Award for extraordinary service to the Fleet in support of the MK 30 Program.
- 1993 - Navy Meritorious Civilian Service Award for outstanding project leadership and technical support to COMOPTEVFOR Test and Evaluation.
- 1993 - Navy Meritorious Civilian Service Award for technical achievement on the MK 48 and MK 50 Torpedo Programs.



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- 1993 - Navy Meritorious Service Medal for outstanding technical contributions at the Arctic Submarine Laboratory.
- 1993 - Navy Meritorious Service Medal for technical excellence in the field of Arctic research.
- 1993 - Navy Meritorious Civilian Service Award for significant contributions to the Operational Evaluation of the MK 50 Torpedo.
- 1993 - Navy Meritorious Civilian Service Award for development of Arctic Pulsed Experimental (Ice-Avoidance Sonar) system.
- 1993 - Navy Meritorious Civilian Service Award for technical achievement in the field of Undersea Warfare Test and Evaluation.
- 1993 - NUWC Division, Keyport Commander's Award for Excellence presented to the MK 50 Torpedo Fleet Introduction Team.
- 1993 - NUWC Division, Keyport Total Quality Achievement of the Year Award presented to the Automatic and Turret Lathe Team.
- 1992 - The Secretary of Defense Quality and Productivity Improvement Excellence Award for significant productivity improvements in technical manual publishing.
- 1992 - The Secretary of Defense Letter of Commendation for solving significant Fleet problems involving MK 102 batteries.
- 1992 - Navy Meritorious Civilian Service Award for outstanding technical achievements in the field of In-Service Engineering.
- 1992 - The first Government Furnished Equipment Provisioning Streamlining Award presented by the Naval Sea Systems Command for developing a new documentation system utilizing Interactive Computer Aided Provisioning System Software.
- 1991 - Legion of Merit Medal Award for outstanding services and technical leadership in directing the Arctic Submarine Laboratory.
- 1991 - Navy Meritorious Civilian Service Award for outstanding technical support to the Fleet.



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- 1991 - Navy Superior Civilian Service Award for technical excellence as Arctic Advisor, Test Director, and Senior Scientist during under ice exercises.
- 1991 - Navy Meritorious Civilian Service Award for Recoverable Exercise Torpedo Design.
- 1991 - Secretary of Defense Letter of Appreciation for outstanding contributions to the MK 46 Torpedo Program.
- 1991 - Runner-up for the Defense Environmental Quality Award for Industrial Installations.
- 1991 - Navy Meritorious Civilian Service Award for contributions to the AN/SQY-1 Surface Ship Antisubmarine Warfare Combat System.
- 1991 - Navy Meritorious Civilian Service Award for excellence in directing the Naval Industrial Improvement Program.
- 1991 - Navy Meritorious Civilian Service Award for outstanding contributions to Lithium firefighting technology.
- 1990 - Navy Meritorious Civilian Service Award for significant achievements in MK 30 Mobile Target shop operations.
- 1990 - Navy Meritorious Civilian Service Award for significant achievement in underwater systems development, installation, and repair.
- 1990 - Navy Meritorious Civilian Service Award for outstanding contributions to torpedo proofing and acceptance testing.
- 1990 - NOSC Exemplary Achievement Award for significant contributions to the MK 50 Torpedo Program.
- 1990 - Department of Defense Honorary Value Engineering Achievement Award for the development of a replacement for the MK 30 end-of-run battery.

i. List all patents awarded to the in-house technical staff members of this activity since 1 January 1990.

<u>Navy Case No.</u>	<u>Title</u>	<u>Patent Date</u>	<u>Patent No.</u>
74430	Digital Beamforming and Filtering Circuit	13 Dec 93	5268877



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68124	Phase Sensitive Detector Circuit for Multipath Acoustic Beams	12 Jan 93	D-10 (C)
67584	High Resolution Multiple Beamforming Array Tracking System	12 Jan 93	D-10 (C)
68088	Fanned Beamformer Network	7 Aug 92	D-10 (C)
71341	Beam Steering Network for Linear Arrays	7 Aug 92	D-10 (C)
72588	Copper Powder Fire Extinguishant	15 Oct 91	5056602
73088	Conveying Digital Data in Noisy, Unstable, Multipath Environments	15 Oct 91	5239560
69405	Color Sonar for Underwater Object Collision Avoidance	9 Jul 91	5031157

j. List all patents applied for by the in-house technical staff members of this activity since 1 January 1990.

<u>Title</u>	<u>Date Applied</u>
Hydrostatic Pressure Bolt	5 Apr 94
Time Delay Stereo Video	23 Mar 94
Compression Amplifier	18 Mar 92
A Target Localization that is Self Correcting for Doppler	3 May 91
A Cross-Correlation Canceling Code Set	27 Aug 90



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k. Identify any in-house staff that are members of the National Academy of Engineering.

n/a

l. Identify any in-house staff that are members of the National Academy of Sciences.

n/a

m. How many Cooperative Research and Development Agreements (CRDA's) have been signed by the activity since 1 January 1990?

One CRDA with Team USA, Bainbridge Island, Washington, for a Rapid Response Recovery System was signed in 1993.

n. What has been the activity's annual royalty income from CRDA's and patent licenses for each year since 1 January 1990?

\$0

o. List and describe any major end item prototypes, either product or process technology, developed in-house by the activity that are currently in production and/or are currently in use by the U.S. Armed Forces or by industry. Cite a published reference that documents the work.

1. APEX-II Sonar. The APEX-II Sonar developed by three Arctic Submarine Laboratory staff members and described by U.S. Patent No. 5031157, "Color Sonar for Underwater Object Collision Avoidance" has been incorporated into the AN/BQS-14A Sonar on all SSN 637 Class Submarines (39 systems), into the AN/BSY-1 Combat System on SSN 688I Class Submarines (over 20 systems), and into the AN/BSY-2 Combat System planned for SSN 21 Class Submarines (two systems). Of note, this sonar function is the first submarine sonar to incorporate full color displays. (NWP-76-17.)

2. Submarine Sidescan Sonar. The Submarine Sidescan Sonar, developed at Arctic Submarine Laboratory in the late 1980's, is installed on all Arctic deploying U.S. submarines. To date, the system has been used on 18 arctic deployments since 1989. (COMSUBDEVRON 12 TMXZ1061-1-93.)

3. Submarine Remote Video System. The Submarine Remote Video System, developed at Arctic Submarine Laboratory in the late 1980's, is installed on all arctic deployed submarines and some submarine special operations. To date, the system has been used on over 20



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deployments. (NAVSEA Funding Document N0002493WR10289 of 24 September 1992.)

4. Submarine Conductivity, Temperature, Depth Systems. The Submarine Conductivity, Temperature, Depth Systems, developed at Arctic Submarine Laboratory in the late 1980's, is installed on all arctic U.S. submarines. To date, the system has been used on over 20 deployments. It is also planned for backfit as a permanent installation on SSN 688I Class Submarines. (COMSUBDEVRON 12 TMXZ1061-1-93.)

5. Submarine Expendable Conductivity, Temperature, Depth System. The Submarine Expendable Conductivity, Temperature, Depth System, developed by Arctic Submarine Laboratory in 1990 to 1991, is planned for use on all future Arctic deployments and for backfit into SSN 688I Class Submarines. (COMSUBDEVRON 12 TMXZ1061-1-93.)

6. MK 50 Retrieval Hardware. A helicopter-deployed retrieval system was designed and developed at NUWC Division, Keyport specifically for Fleet use in recovering MK 50 Torpedoes during Fleet training exercises. This system was based on concepts developed and employed at Keyport. (Patent # 4447083 was awarded to NUWC Division, Keyport in 1984.)

7. Quinault Littoral Water Tracking Technology. In support of the development of a shallow water range, NUWC Division, Keyport developed a reverberation-tolerant tracking signal which has been subsequently employed in temporary shallow water sites and by a foreign navy in a similar test range. The Spaced Frequency Shift Keying (SFSK) allows reliable tracking in highly reverberant channels and in the presence of countermeasure interference. Underwater tracking accuracy is typically within 10 feet. (The reference is patent #4463452 - SFSK Tracking System awarded in 1984.)

8. Surface Ship Radiated Noise Measurement (SSRNM) System. The SSRNM shoreside upgrade is a real-time acoustic measurement system used in support of NAVSEA's surface ship silencing program. The system is operational at the San Clemente Island Underwater Range site and ready to be installed at the Atlantic Fleet Weapon Test Facility's St. Croix range site. This system supports surface tracking, acoustic data acquisition, and signature analysis. (NAVSEA Task Assignment Number N0002491PX34823.)

9. Magnetic Silencing Range Analysis System. A personal computer based analysis package for the Magnetic Silencing Range Type III system was designed and developed at NUWC Division, Keyport. The main function of the system is to acquire and analyze the magnetic signature of steel-hulled surface ships and submarines. The system is now running at the Norfolk Magnetic Silencing Facility (MSF), the Pearl Harbor MSF, and the New London MSF. (NAVSEA Task Assignment Number N0002492PX37001.)



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10. Equipment developed and in use to support the MK30 Mobile Target.

Background. The MK 30 Mobile Target is an underwater, internally-guided, 21-foot torpedo-shaped device. The system emits underwater acoustics to simulate submarines for Fleet exercises on instrumented ranges. The target is deployed from small boats and helicopters onto the range. The system is powered internally by large and expensive high-capacity rechargeable silver-zinc batteries.

a. MK 30 Target Multi-Launcher. NUWC Detachment Hawaii designed and developed a hydraulically-powered, worm gear driven deployment system used to launch the target from a surface boat. The system carries and launches three MK 30 Targets in a specific sequence in an automatic mode. (NUWC Detachment Hawaii Technical Manual TM 84-76 of 22 August 1984.)

b. MK 30 Target Kingpost Launcher. NUWC Detachment Hawaii designed and developed a hydraulically-powered and driven launcher system built specifically for the larger 125-foot Torpedo Weapons Retriever (TWR) boats. The targets are carried on the deck of the TWR and can be loaded onto the launcher at sea in any sequence and in any number. The launch is automatic with the pressing of a button. (NUWC Detachment Hawaii Technical Manual 86-171 of August 1989.)

c. MK 30 Automatic Battery Charger. The MK 30 Target is powered internally by large silver-zinc batteries. Each run of the target requires recharging the batteries for up to 16 hours. The Detachment-developed equipment was designed and built to automatically charge the batteries unattended. The system monitors the state of charge of each of the individual cells, terminating the current on a fully charged battery and reinstating the charge on the rest of the still-low batteries. (NUWC Detachment Hawaii Technical Manual TM 80-110 of 30 September 1980.)

d. MK 40 ADMATT Battery Charger. Similar to the description above, this automatic charger was designed and built by NUWC Detachment Hawaii to charge the internal batteries of the ADMATT Target. (NUWC Detachment Hawaii Technical Manual 85-98 of 29 October 1985.)

e. MK 30 Target Battery Discharger. NUWC Detachment Hawaii designed and developed the MK 30 Target Battery Discharger for extended life of the MK 30 Target's batteries. The batteries are discharged after a specific number of charges to eliminate charge memory and to balance the cells. The discharger pulls a constant load from the batteries at a prescribed rate and dissipates the power automatically for unattended functioning. (Prototype Only - NUWC Detachment Hawaii Drawing 32688.)



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f. MK 30 Target Automatic Vacuum System. NUWC Detachment Hawaii designed and developed the MK 30 Target Automatic Vacuum System. In any device designed to work underwater, the final check of the system is to establish a vacuum and check for leaks. The system automatically enters a sequence of establishing a vacuum in the target, allowing a period of stabilization, checking for system leaks, and recording the pressure sensor data at each point. The device is controlled by a microprocessor and is fully automatic under the control of software. (NUWC Detachment Hawaii Drawing 32668, Procedure 173B.)

11. Equipment developed and in use to support the MK 84 Pinger.

Background. NUWC Detachment Hawaii is also involved in pinger work. Pingers are underwater devices which emit acoustic signals such that the devices can be tracked and information received from them on ranges equipped with underwater listening devices. The pingers, repaired and maintained at NUWC Detachment Hawaii, are used at various underwater ranges around the Pacific, but primarily at the Pacific Missile Range Facility on Kauai, Hawaii.

a. Alkaline Power Packs. The Atlantic Fleet Weapons Training Facility in Puerto Rico houses their pingers in a waterproof container and attaches these special containers to the ship or submarine to be tracked on their underwater range. NUWC Detachment Hawaii designed and fabricated special power supplies and control circuits using multiple alkaline cell packs vice the nickel-cadmium then being used. These power packs gave the tracking devices a longer and more stable life on range. (NUWC Detachment Hawaii Technical Manual TM 91-39 of July 1992.)

b. Range Craft Instrumentation. At every instrumented range, all vessels in the water, including support craft, are instrumented for tracking purposes. The reason for tracking the vessels is safety, so the positions of the boats, ships, and submarines are known at all times. NUWC Detachment Hawaii designed and built a tracking instrumentation system for the Atlantic Fleet Weapons Training Facility support boats, including an underwater seachest housing for the transducer and a dual electronic signal driver to provide the tracking signal. (NAVSEA Drawing 6747175, Procedure Only.)

c. The Acoustic Test Facility. NUWC Detachment Hawaii designed and built an Acoustic Test Facility. The facility is comprised of a concrete, fresh water tank measuring 26 feet in diameter by 25 feet in depth and a separate building which houses the electronics. Underwater acoustical devices are placed in the tank, and the emitted acoustics are received and analyzed by the electronics at the facility. The facility is used to test the pingers' beam pattern and waveform. (NUWC Detachment Hawaii Technical Manuals TM 91-7 of April 1991, TM 93-30 of November 1993.)



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d. Experimental (EX) 622 Test Sets. NUWC Detachment Hawaii designed and developed EX 622 Test Sets. The MK 84 Pinger transmits information (ping number, ID, depth, etc.) in binary form modulated on a 13 kHz carrier. The original laborious method of checking the information was to synchronize an oscilloscope to the signal and check the state of the signal at the different portions of the carrier signal. The subsequently developed test set automatically displays the state of the binary signals in the entire bit stream. It also simultaneously converts the binary information into decimal form which can be read directly off the screen without operator action or interpretation. (NUWC Detachment Hawaii Technical Manual 82-67 of 5 January 1983.)

e. Depth Sensor Test Set. The MK 84 Pinger Transducer internally contains a depth sensor which provides the modulating depth information to the carrier signal. For proper maintenance and functioning, the depth sensor is tested on the bench using a NUWC Detachment Hawaii designed and built Depth Sensor Test Set. (NUWC Detachment Hawaii Tech Manual 87-48 of August 1987.)

f. Submersible Pinger Container (SPC). There are numerous special projects where the underwater device's position needs to be tracked. NUWC Detachment Hawaii has designed and built several SPC's in which an acoustic pinger can be housed and attached to the device to be tracked. Depths for these special containers vary from 1,000 to 4,000 feet. (NUWC Detachment Hawaii Drawing 32244.)

12. Post-Operational Analysis Critique and Exercise Review Process. The Post-Operational Analysis Critique and Exercise Review (PACER) Antisubmarine Warfare (ASW) weapons platform analysis process was designed, developed, installed, and is maintained by NUWC Detachment Hawaii at all sites. The process has been implemented Navy-wide, and has applicability to other warfare areas and military services. PACER support is provided by five sites at locations in Hawaii; San Diego, California; Keyport, Washington; and St. Croix, U.S. Virgin Islands. PACER provides quantified, rapid, engineering-quality analysis that measures all aspects of weapons systems performance from individual operators' actions and hardware components' accuracy and reliability to the total battle force tactics, communications, and unit employment. The analysis quantifies performance of navigational systems, fire control systems, sonars, sonobuoys, Magnetic Anomaly Detection systems, communications links, training devices, and targets, as well as their operating personnel. PACER analysis localizes hardware malfunctions down to the module or component level. At any time during the overhaul cycle, PACER lets ASW units check their ability to test, calibrate, and align themselves and interface with other systems. The PACER techniques allow units to learn from their own and other units' errors and improperly employed tactics. ASW units have evaluated PACER "lessons learned" videotapes of battle group and real world ASW operations as "a timely, dynamic, multidimensional record of ASW actions which reaches more people and provides more cost-effective ASW Operations training benefit than volumes of written



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analysis reports." Navy schoolhouses are using PACER videotapes to train weapons platforms personnel to perform their ASW missions. ASW training activities have stated that the PACER videotapes are outstanding for the training environment. ("PACER Site Training Guide", NUWC Detachment Hawaii TM 83-3, dated July 1984; "PACER Team Manual", NUWC Detachment Hawaii TM 89-38, dated January 1990; and "Air PACER Analysis Guide", NUWC Detachment Hawaii TM 83-11 Rev. A, dated July 1993.)

13. Training Notebook System. The Training Notebook System (TNS), developed by NUWC Detachment Hawaii, is a computer software system which serves as an automated management tool to assist the NAVAIR PMA205 Program Manager in overseeing management of weapons training systems. TNS provides a number of management tools to assist the PMA205 managers in their daily management functions, a centralized source of working documents, and a computerized library of program information. TNS is a Windows-based software system which provides automated forms, standardized data templates, word processing, spreadsheet, presentation graphics, and scheduling capability. TNS offers organization of the PMA205 work environment, broken down into five electronic "Notebooks" and a set of management tools, for easy access to program system and resource information. The Planning Notebook contains program briefs, schedules, inventories of training courses, devices, and Engineering Change Proposal Tracking. The Programming Notebook is used to create and update training device, course, and facility projects under the program level. The Budget Notebook tracks financial documents, such as LRFP's, Spend Plans, Airtasks, Funding Requests, and Funding Requirements. The Audit Notebook is used to file LRG checklists, audit findings, and other information pertinent to audit preparation. The Document Notebook contains reference training documents, program documents, and contracting documents. Management Tools is a set of additional system features which includes TNS file transfer capabilities, a memorandum file, and a suite of administrative forms. (Training Notebook System V1.2, NAVAIR PMA205-1H, User's Manual - 7/93; Training Notebook System V1.2, NAVAIR PMA205-1F, User's Manual - 7/93; and Training Notebook System V1.2, NAVAIR PMA205-2D/2E, User's Manual - 9/93.)

14. Logistic Management System. The Logistic Management System (LMS), designed and developed by NUWC Detachment Hawaii, is a software application product based on dBase IV. LMS is used to manage multiprogram logistic requirements of typical Navy Intermediate Maintenance Activities and Depots. LMS provides for tracking of spare assets; equipment assets; storeroom functions, such as ordering, issuing, and tracking of age-dated and Hazardous Material; consumables; equipment calibration; weight testing, etc. This application is used at NUWC Detachment Hawaii, NUWC Detachment San Diego, Atlantic Fleet Weapon Test Facility Puerto Rico, and Naval Surface Warfare Center Indian Head. (NUWC Detachment Hawaii TM 92-43, LMS Users Guide, 16 April 1993.)



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15. Advanced Audio Generator Subsystem Development/Production Program. NUWC Division, Keyport developed and completed follow-on production for the Advanced Audio Generator Subsystem (AAGS). The AAGS was a major redesign of an existing audio generator unit used to provide acoustic audio stimulation for submarine acoustic operator training. This redesign incorporates state of the art digital signal processing technology and extensively utilizes Commercial Off-The-Shelf (COTS) hardware. The development was performed fully from in-house and NUWC Division, Keyport Technical Services Contract resources. The follow-on production program is in-process to build nine production units for use at nine AN/BQQ-5E trainer sites. The production program is being performed 100 percent in-house and provides minor manufacturing, assembly of COTS and manufactured hardware, and final acceptance testing. The total program is valued at \$9.8M. (Program Executive Office, PMO 409 Combat Systems Tasks Books FY 91 - FY 92.)

16. Fast Time Analyzer EC-1 Upgrade. The Fast Time Analyzer EC-1 Upgrade is a direct application of Commercial Off-The-Shelf/Non-developmental Item hardware and software into combat systems hardware. It will be installed on all aircraft carriers beginning in June 1994. It is currently installed and functioning at NUWC Division, Keyport.

The existing FTAS (AN/UQX-5) employed an AYK-14 computer based processor which was limited in capabilities due to incompatibility with the Windows environment (preferred by Fleet operators) and the speed of computer operations (needed for addition of the real time Acoustic Intercept Screener.)

The upgraded system has met all Fleet expectations for operability and performance. The AIS capability gives the Carrier Battle Group an additional tool for detecting the prime littoral threat-the electric submarine operating in noisy coastal waters. (NAVSEA Task 61Y-00001-001-3-8210.)

17. MK 28 Mod 3 Target and the MK 1 Mod 3 Transponder. NUWC Division, Keyport is developing and manufacturing the MK 28 Mod 3 Target and the MK 1 Mod 3 Transponder on NAVSEA Project Order 92PX43689. The MK 28 Target and the MK 1 Transponder comprise our Service Weapons Target system. (NAVSEA Project Order 92PX43689.)

18. Submarine Launched Mobile Mine Fire Control System. NUWC Division, Keyport is responsible for developing the EX 122 Mod 0 Submarine Launched Mobile Mine (SLMM) Fire Control System. This system is a lightweight, compact, portable system used for launching the MK 67 SLMM from SSN 688 Class submarines. This system replaces the MK 281 Mod 2 Interim Fire Control Panel, Engineering Development Model. (COMNAVSEASYS COM (PMS 396E) Task Statement of 4 March 1993.)



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19. MK 46 Recoverable Exercise Torpedo (REXTORP). The REXTORP is a reusable, non-running, presettable exercise torpedo that was designed, developed, and fabricated at NUWC Division, Keyport. The MK 46 REXTORP is currently in production and in use by the Fleet to augment ASW training. The REXTORP is launched by any MK 46 Torpedo firing craft and is much less costly to maintain and turn around for subsequent firing than an actual exercise torpedo. This system was developed to replace Fleet firing of the MK 46 Torpedoes. To date, there are over 600 units in use in the Fleet. Since its initial design, there have been several versions of this system to support Fleet readiness training. The concept and design was extensively modified to meet Vertical Launch ASROC testing and training requirements. (Engineering Change Proposal 46-5/NUWES/1197 and Funding Document 89PX40058.)

20. MK 50 Recoverable Exercise Torpedo (REXTORP). The REXTORP is a reusable, non-running, presettable exercise torpedo that was designed, developed, and fabricated at NUWC Division, Keyport. The MK 50 REXTORP is currently in production and in use by the Fleet to augment ASW training. The REXTORP is launched by any MK 50 Torpedo firing craft and is much less costly to maintain and turn around for subsequent firing than an actual exercise torpedo. The concept, design, development, and testing for this system was totally done at NUWC Division, Keyport. This was projected to be a high risk program due to the uniqueness of the deballast mechanism. To date, there are about 100 systems in tests in the Fleet and at NUWC Division, Keyport. (Engineering Change Proposal 50/NUWC-K/5517 and Funding Document 90PX42134.)

21. SEAWOLF Torpedo Tube Trainer. NUWC Division, Keyport has been provided funding to design and fabricate all new training systems which will replace the World War II type torpedo tube equipment still in use at New London. These systems will allow hands-on training by sailors on hardware that represents the new modern Fleet assets. (Funding Document 92PO20002.)

22. ASROC Instrumentation. To support the ASROC community, NUWC Division, Keyport designed and developed a small, self-contained electronic box which starts recording—solid state analog—acceleration data at launch and throughout the ASROC flight. At splash-down, the system automatically shuts off. Data is extracted from the module and stored in a computer. Many modes of data display are available. (Local Statement of Work of 7 October 1992.)

23. Fire Control Interface Modification. NUWC Division, Keyport is completing development of a small surface mount module to decrease the cost of the MK 50 REXTORP fire control interface. This unit employs the use of Reduced Instruction Set Computer based microcontroller technology. (Task Assignment FY9420108.)



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24. Penguin Captive Air Training Missile Launch Kits. NUWC Division, Keyport was tasked by NSWC Indian Head to design, document, test, and fabricate launch kits for the Penguin Captive Air Training Missile (CATM). Several new processes were developed to fabricate the wings and meet the design requirements, including the use of molded polyurethane parts to reduce machining and save weight, and a process for bonding the wing skins to the wing structure using a urethane adhesive. NUWC Division, Keyport has fabricated 31 CATM launch kits to meet Fleet training needs. (N0017493PX30001 - Penguin CATM Prime Item Development Specification, NOS 650-174-TD-004.)

25. Protective Armor for MK 50 Torpedo Boiler. NUWC Division, Keyport was tasked to work concurrently with NSWC White Oak in developing an assembly to protect the MK 50 Torpedo boiler when the torpedo is stored in the ready weapons locker on the deck of some ships. Prototypes were fabricated in titanium and aluminum to drawings developed by White Oak, which incorporated changes recommended by this Division to maximize ease of manufacture and take advantage of in-house equipment. The result of this cooperation was delivery of the prototypes within two months of receipt of funding, and a drawing package that specifies only the minimum requirements, allowing the parts to be easily made at most any facility or private machine shop. (N0002494WX00546AA FY942012-17X.0.)

26. MK 525 Mod 3 Test System. This is an automated, portable, suitcase configured test system for conducting MK 48/ADCAP Torpedo Intermediate Maintenance Activity performance tests on MK 21 Exploder Mechanisms. The MK 525 Mod 3 replaces the manually operated Mod 1 configuration which was plagued with maintenance/reliability problems. The Mod 3 is microprocessor-controlled, incorporating a touch screen for operator interface, and provides a printed data sheet of test results. Design, development, and production of the MK 525 Mod 3 was performed by NUWC Division, Keyport. (NAVSEA Task Assignment 63-88-5A169-R7 and NAVSEA Funding Document N0002487WR44063.)

27. MK 281 Mod 2 Interim Fire Control Panel. NUWC Division, Keyport is responsible for developing the MK 281 Mod 2 Interim Fire Control Panel. This portable fire control panel is used for the specific purpose of launching the MK 67 Submarine Launched Mobile Mine (SLMM) aboard SSN 637 Class and SSN 688 Class Submarines. This fire control panel was developed as the sole means of providing the Fleet the capability to deploy the MK 67 SLMM. (Direction to perform this work is documented in CNO Memo 374P/680, dated 30 January 1987.)

28. Range Boundary Shutdown System (RBSS). NUWC Division, Keyport was requested to design and develop a microprocessor-controlled torpedo shutdown system to prevent exercise torpedoes from leaving an instrumented range. The RBSS is designed to cause the torpedo to shutdown if it travels outside preset boundaries set around an instrumented range. The RBSS has been implemented in the exercise sections of both the MK 48 and MK 48/ADCAP



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torpedoes. (SW513-E0-PRO-050 for MK 48/ADCAP Torpedo; NUWC Division, Keyport Procedures 38373 and 38381 for MK 48 Torpedo.)



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## FACILITIES AND EQUIPMENT

6. **Special Facilities/Equipment Resources.** Include a copy of the form provided at Tab B of this data call for each facility and "major" piece of equipment located at this activity. Include information on separate detachments. The following definitions will apply:

Facilities - Will include such things as rocket firing bays, towing tanks, anechoic chambers, hypervelocity gun ranges, hyperbaric chambers, wind tunnels, simulation/emulation laboratories, etc. Include buildings that are integral to the facility/equipment. Do not include major outdoor ranges or land.

Also, describe modeling and simulation capabilities, hardware in-the-loop facilities and analysis or wargaming capabilities.

Equipment - Resources used to support the operation of the site with a replacement value of \$500,000 or greater. Do not include land or buildings in this category. In reporting equipment, provide information to indicate the degree of portability of the equipment.

Class 3 Personal Property items ("plant equipment" or "equipment in place") by definition are highly portable and can be moved easily. Some Class 2 Installed Equipment, such as Main-frame computers, test stands and small hyperbaric chambers, require more extensive utilities support and assembly of components, but can be relocated without damage to the facility or equipment, and therefore are considered "moveable" assets. Other Class 2 items are so large and/or integral to the facility that houses them that major demolition and construction would be required to relocate them, and therefore are considered "fixed" assets. Where appropriate, pieces of equipment can be aggregated for the purposes of completing Tab B.



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## NUWC DIVISION, KEYPORT SPECIAL FACILITIES

Undersea Weapons Repair and Maintenance Depot . . . . .	6-5
Undersea Weapon Evaluation Facility (UWEF) . . . . .	6-11
Torpedo Explosive Operating Complex . . . . .	6-16
Torpedo Storage Magazines . . . . .	6-19
Hardware Environmental Test Facility . . . . .	6-23
Range Craft . . . . .	6-32
Target MK 30 and Range Tracking Pinger IMA's . . . . .	6-38
Shipboard Electronic Systems Evaluation Facilities . . . . .	6-43
Combat Systems Facilities . . . . .	6-48
Transducer Automated Test Facility . . . . .	6-53
Weapon Acceptance and Operational Test Facility . . . . .	6-58
Underwater Noise Analysis Facility (UNAFAC) . . . . .	6-62
Light Industrial Support Facility . . . . .	6-67
Industrial Waste Treatment Facility . . . . .	6-72
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Navy Mine Depot . . . . .	6-109



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**SPECIAL FACILITIES TO FUNCTIONAL  
SUPPORT AREAS MAPPING**

	2.2	2.4	2.5	2.9	5.1	7.1	8.2	10.1.1	10.1.4	10.2	10.3	10.4	10.7	10.9
	Guided Missiles	Torpedoes	Mines	Fire Control	Sonar Systems	C <sup>3</sup> I-Submarine	Countermeasures	Sub Related Training Syst	Weapons Rltd Trng Syst	Log. Planning & Impl	Facilities Engineering	Diving/Salvage/Ocean Engr	Range Dev. and Operations	Mission and Function Supp.
Undersea Weapons Repair & Maintenance Depot		●	●				●							
Undersea Weapon Evaluation Facility (UWEF)		●					●							
Torpedo Explosive Operating Complex		●					●							
Torpedo Storage Magazines		●	●			●	●							
Hardware Environmental Test Facility		●	●	●			●							
Range Craft		●	●				●						●	
Target MK 30 & Range Tracking Pinger IMA's		●	●	●	●			●	●					
Shipboard Electronic Systems Evaluation Facilities						●	●	●						
Combat Systems Facilities				●	●									
Transducer Automated Test Facility		●												
Weapon Acceptance & Operational Test Facility		●	●	●	●	●	●						●	
Underwater Noise Analysis Facility (UNAFAC)		●											●	



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**SPECIAL FACILITIES TO FUNCTIONAL  
SUPPORT AREAS MAPPING (continued)**

Light Industrial Support Facility	●	2.2	Guided Missiles
Industrial Waste Treatment Facility	●	2.4	Torpedoes
Hazardous Waste Trtmt/Storage/Disposal Facility	●	2.5	Mines
Otto Fuel II Reclamation Plant	●	2.9	Fire Control
Lithium Decontamination Facility	●	5.1	Sonar Systems
Recycling Facility	●	7.1	C <sup>3</sup> I-Submarine
Hyperbaric Chamber	●	8.2	Countermeasures
Automated Material Handling Facility	●	10.1.1	Sub Related Training Syst
Naval Undersea Museum	●	10.1.4	Weapons Rltd Trng Syst
Arctic Submarine Laboratory	●	10.2	Log. Planning & Impl
Navy Mine Depot	●	10.3	Facilities Engineering
		10.4	Diving/Salvage/Ocean Engr
		10.7	Range Dev. and Operations
		10.9	Mission and Function Supp.



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**SPECIAL FACILITIES AND EQUIPMENT  
FACILITIES/EQUIPMENT CAPABILITY FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Facility/Equipment Nomenclature or Title	Undersea Weapons Repair and Maintenance Depot

**1. State the primary purpose(s) of the facility/equipment.**

This highly specialized, state-of-the-art complex is the Nation's only defense repair and maintenance depot for the Navy's full arsenal of developmental, in-service, and retiring undersea weapons, torpedoes, mobile mines, and targets. The Navy's sole undersea warfare repair and maintenance depot complex comprises 14 specialized weapons shops, repair facilities, and testing laboratories. Hundreds of unique depot repair and maintenance equipments ranging from totally automated electronic test and repair stations, to robotically controlled mechanical repair stations, combined with over seven thousand of years of specialized technical experience possessed by the engineers, technicians, and skilled artisans who operate and maintain them, comprise this absolutely unique repair complex. This unmatched test, fabrication, and repair complex not only supports the U.S. Navy's core undersea weapons repair needs, but those of 23 Allied nations (Foreign Military Sales customers) as well. Since depot repair processes require responsible handling of hazardous materials, wastes, and explosive components, unique explosive handling and environmental storage equipment and facilities have been developed to accomplish this task. Special environmental facilities and equipment are on-line to handle the storage, reclamation, and disposal of hazardous materials such as Otto fuel II and lithium. NUWC Division, Keyport's decontamination facilities are the Navy's only certified facilities for lithium decontamination. The synergy of collocating the depot, torpedo explosive handling and storage, and hazardous material disposal and reclamation facilities at this single site provides the Navy and its customers with the most efficient option for the maintenance, repair, and upgrade of its undersea warfare systems. This facility provides the Navy with a mobilization surge capacity to meet immediate Fleet wartime needs as well as the ability to draw upon the weapons stored in the magazines at the Undersea Warfare Annex for second-strike loadouts. The technical knowledge, tooling, test equipment, and processes that will be necessary to reconstitute commercial torpedo production to replenish the Navy's torpedo inventory upon mobilization will be maintained by these shops and the engineers that support them for transfer to private industry when needed.



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The Naval Sea Systems Command has identified the Undersea Weapon Repair and Maintenance Depot facility as having unique and essential capabilities in recent studies, and it is in direct support of the policy imperative to maintain organic capability to provide Fleet maintenance.

**2. Indicate whether the facility/equipment is portable, moveable or fixed as defined by paragraph 6, 12 of this data call.**

The equipment in most of the buildings is portable, with the exception of several fixed assets, special purpose automatic test equipment, etc., some of which are movable assets by the definitions. The fixed assets are an integral part of the associated buildings/structures. Special foundations, sumps, and integrated plumbing and ventilation make the buildings and facility an integrated whole. The following assets are in this fixed asset category:

- Two monopropellant fueling rooms.
- Three decontamination/clean up areas.
- One high pressure gas charging room.
- One warhead refurbishment building.
- One clean room.
- One lithium decontamination building.

**3. Provide the replacement value of the facility/equipment. Report the facility/equipment cost separate from any building and utilities that may be integral to the facility/equipment.**

The replacement value of the fourteen basic facility buildings based on a dollar value per square foot is \$34,480,000. The replacement value of the special equipment located inside the fourteen Depot shops is \$121,882,000.

**4. Provide the gross weight and cube of the facility/equipment.**

The estimated gross weight of the special Depot equipment located in the basic facilities is 311,798 lbs. The cubic volume of this equipment is 46,005 cubic feet.



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**5. Indicate any "special" utility support required by this facility/equipment other than normal electrical power.**

Each of the fourteen facility buildings requires unique utilities depending on the test equipment and type of work performed. A listing of the special utilities is:

Electrical: 220 volt, 60 cycle, 3 phase  
208 volt, 60 cycle, 3 phase  
120 volt, 400 cycle, 3 phase  
450 volt, 60 cycle, 3 phase  
voltage conditioning & surge protection

Air: 120 psig to 2,000 psig (filtered)

Water: Closed loop equipment cooling

Gas: 2,500 psig nitrogen  
250 psig Sulfur Hexafluoride  
250 psig Argon

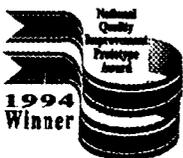
Grounding: Ordnance grounds

**6. Indicate any special budget requirements for the facility/equipment (i.e., special foundations, non-ferrous materials, shielding, hardening, etc.).**

Because most of the Depot processes require handling of hazardous material and wastes or explosives, special ventilation, sumps, bermed areas, and unique explosive handling equipment and protection are required. Special facilities requirements include: explosive handling operating buildings and magazine storage, massive cement foundations for gyro and inertial measurement units, decontamination tanks for lithium, monopropellant fueling areas, fuel tank and propulsion system cleaning rooms, fuel reclamation areas, high pressure gas charging rooms, etc.

**7. State any environmental control requirements for the facility/equipment (i.e., temperature, humidity, air scrubbing).**

The majority of the electronic test equipment located in the fourteen depot buildings require temperature and humidity control. Numerous areas contained in the buildings require special



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ventilation and monitoring devices for hazardous waste stream sumps (to keep wastes separated) with bermed storage and spill alarms.

**8. Indicate if this facility/equipment would be extremely difficult or impossible to replicate or relocate at another site and the impact to the Department of the Navy if this facility/equipment were lost. Consider existing Government-wide and commercial capabilities as the replication and impact statements are formulated.**

This facility would be extremely difficult and very costly to replicate or relocate. Most of the Depot buildings contain unique equipment to provide this capability. The buildings have been built or configured with special construction amenities (e.g., hazardous fume ventilation systems, foundations for inertial measurement unit test equipment) to allow the use and operation of the unique equipment. Most of the equipment cannot be relocated to a new or existing building without extensive reconfiguration or construction. This facility is the Navy's only torpedo and underwater mobile target organic repair and maintenance Depot. Loss of this organic capability would severely impact Fleet readiness. The Depot facilities have in place approved emissions and environmental safety equipment and procedures and certifications for handling the exotic fuels, explosives, and other corrosive and caustic materials associated with supporting undersea weapons. Alternate sites would not be able to support the full spectrum (test, repair, hazardous waste, explosive handling, etc.) available at this facility. Relocating the numerous functions at multiple sites would increase logistic and support pipelines and degrade weapon availability.

**9. Indicate how and when the facility/equipment was transported and or constructed at the site.**

The various Depot buildings were either constructed or extensively modified to support the weapon systems, mobile targets, mines, and fire control systems as they were introduced into the Fleet. The lightweight and heavyweight torpedo Depots were activated from 1968 to 1984. The mobile target antimine Depots were established from 1968 through 1994. Keyport has been a torpedo maintenance facility for over 80 years. The physical plant has been constructed around underwater weapon requirements with each new weapon system taking advantage of the facilities of its predecessor. To relocate this facility in total would require a major and costly reconstruction program.



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**10. List the functional support areas (previously provided in Tab A) that this facility/equipment support. Refer to Appendix A for the list of Functional support areas.**

The Depot facilities support the following functional areas:

- 2. Weapons Systems
  - 2.4 Torpedoes
  - 2.5 Mines
- 8. Defense Systems
  - 8.2 Countermeasures (CM)

**11. Provide the historical utilization average for the past five fiscal years (1989-1993). Define the unit of measure used.**

The quantity of torpedo, target, and mine items processed through the Depot per fiscal year is the unit of measure. The items are DLR's (Depot Level Repairables), and complete All-Up Round (AUR) and exercise weapons issued. AUR's are completely ready warshot torpedoes with warheads.

FY	Repairables (DLR's)	AUR's and Exercise Units Issued
1989	42,648	2,373
1990	38,535	2,596
1991	31,774	1,689
1992	31,502	2,628
1993	26,092	3,045

**12. Provide the projected utilization data out to FY 1997.**

FY	Repairables (DLR's)	AUR's and Exercise Units Issued
1994	30,177	3,191
1995	22,586	2,266
1996	22,880	2,321
1997	23,216	2,086



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**13. What is the approximate number of personnel used to operate the facility/equipment?**

The total number of people required to operate the Depot facilities based on the FY 94 workload is approximately 600 manyears.

**14. What is the approximate number of personnel needed to maintain the equipment?**

To maintain, calibrate, and repair the Depot test and support equipment requires approximately 40 people.

**15. Provide one 8 1/2 X 11 black and white photo of the facility/equipment.**

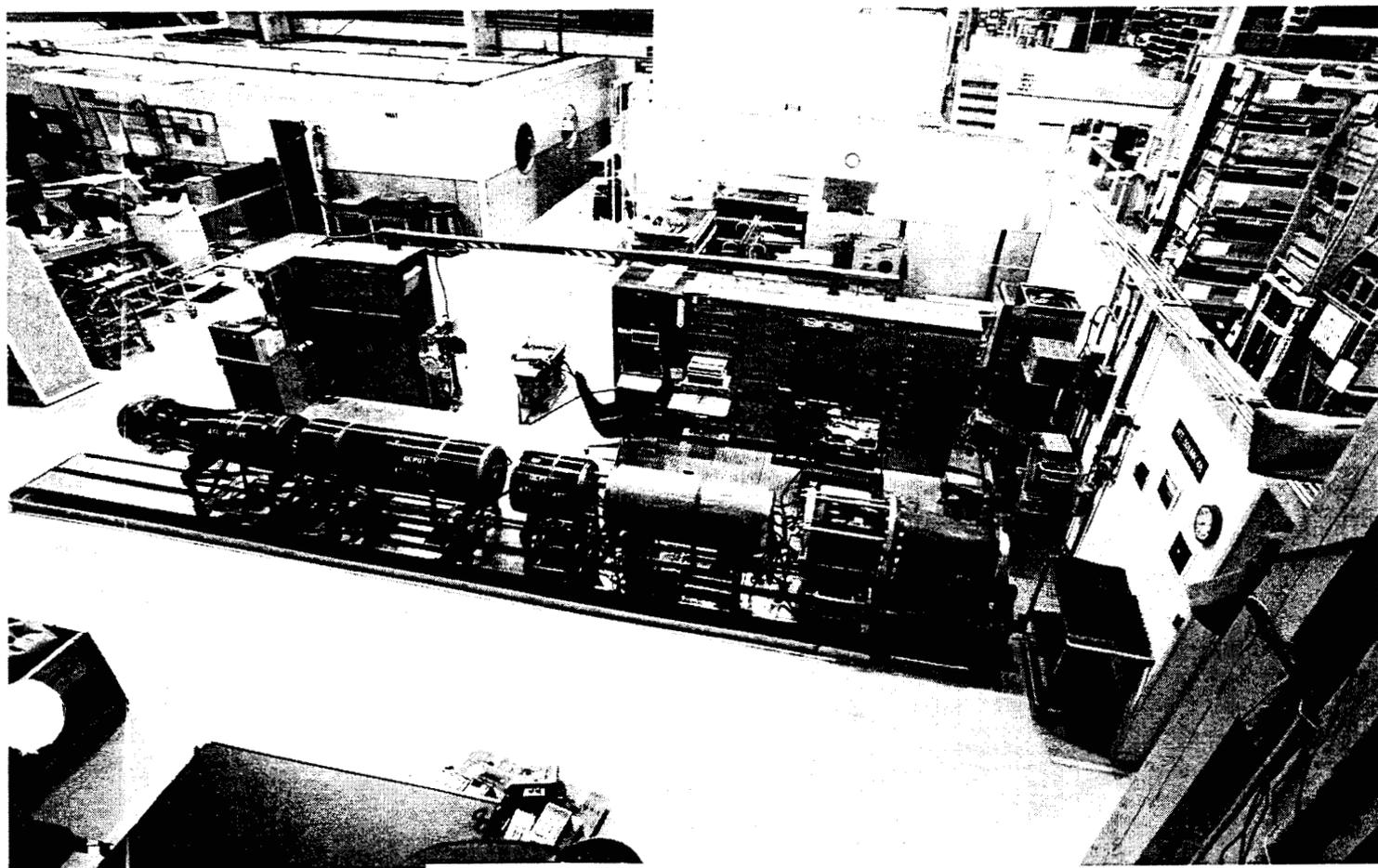
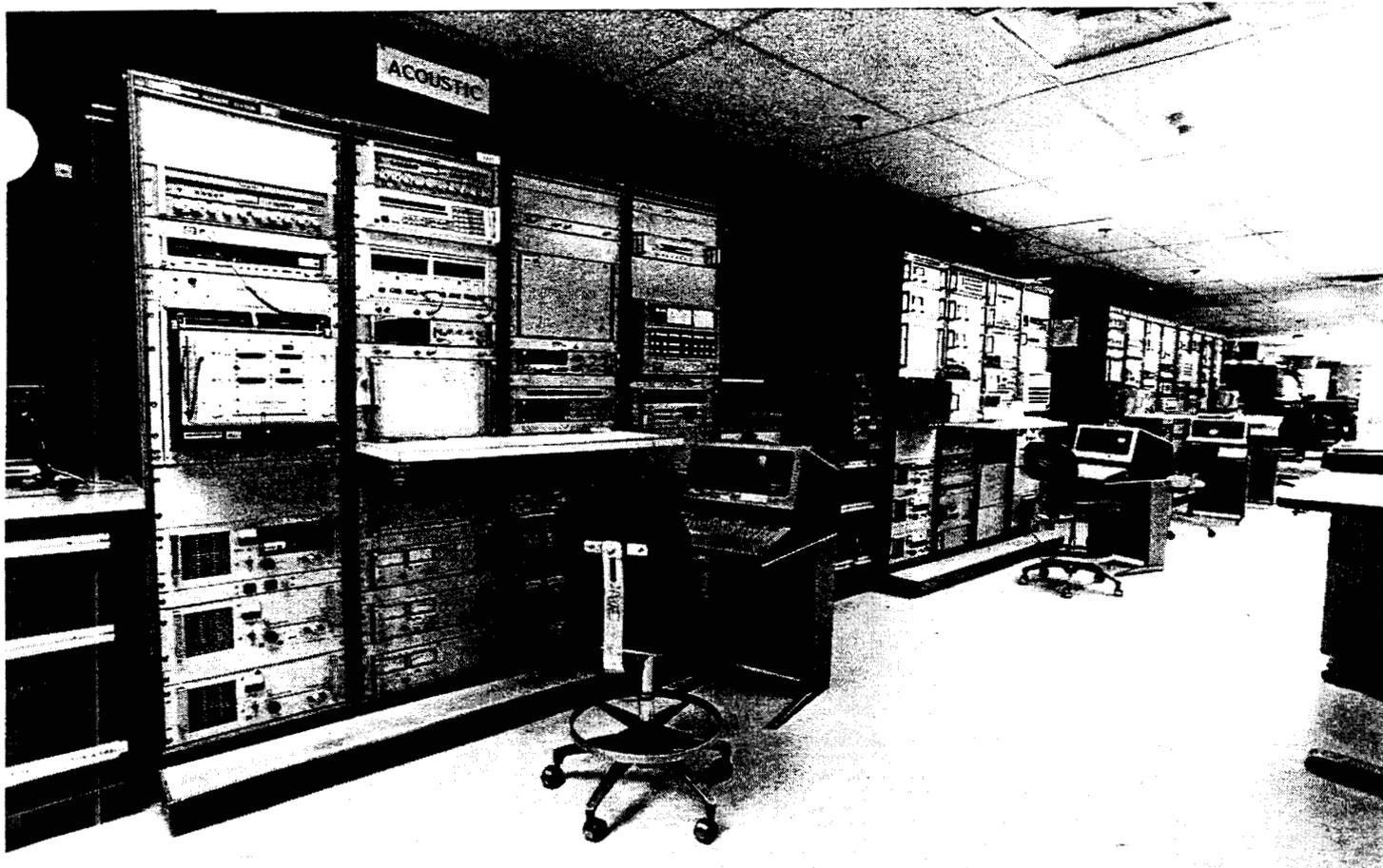
See Attached.



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# UNDERSEA WEAPONS REPAIR AND MAINTENANCE DEPOT



NUWC DIVISION, KEYPORT

**SPECIAL FACILITIES AND EQUIPMENT  
FACILITIES/EQUIPMENT CAPABILITY FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Facility/Equipment Nomenclature or Title	Undersea Weapon Evaluation Facility (UWEF)

**1. State the primary purpose(s) of the facility/equipment.**

The Undersea Weapons Evaluation Facility is the only hardware-in-the-loop test system of its type which permits land-based captive testing of complete undersea weapons and other vehicles operating under their own power in a land-based water-filled test chamber. UWEF is a land-based test site that complements the underwater ranges and other test facilities of Naval Undersea Warfare Center Division, Keyport in undersea weapon testing. It is supported by skilled engineers and technicians with a combined total of over 100 years of experience in the highly specialized fields of weapons testing and simulation applications. The UWEF mission is to test undersea weapons and other vehicles, with specific focus on weapon acceptance testing; in-service problem diagnosis; corrective action verification; service life evaluation and surveillance; ORDALT and engineering change verification; and pre-range weapon readiness verification at lower cost than traditional types of testing. UWEF provides essential shop-based undersea weapon test capabilities that complement those provided by undersea ranges. As such, UWEF and Undersea Ranges mutually focus on weapons performance, test, and evaluation. The two resources are complementary in providing a comprehensive suite of capabilities. UWEF's strengths lie in its ability to provide:

- Rapid turnaround and short test cycle time.
- Test scenario feasibility.
- Test environmental scenario controllability and repeatability.
- Retest/Re-stimulation.
- Data Integration.
- Real-time data acquisition and analysis.
- Highly dense, robust, test scenarios.

UWEF is necessary for support of the Keyport mission areas of T&E, Depot Maintenance and Repair, Foreign Military Sales, and In-Service Engineering. As such, it is, and must be, colocated with the facilities at Keyport that support those functions. Similarly, UWEF draws upon several other functional areas at Keyport. For example, there is no capability within UWEF to assemble a weapon for test, nor is there the ability to process Otto fuel



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contaminated water or the ability to fabricate special weapon test fixtures. UWEF is located adjacent to the industrial facilities, weapon preparation and depot shops, Otto fuel treatment facility, and other Northwest ranges to allow sharing of facilities, capabilities, and an expedient interchange of test data. Separation from any one of these would require more functions be added to UWEF.

Weapon propulsion, control, auto pilot, and acoustic operations are integrated in UWEF testing as in range and at sea testing. Weapon acoustic stimulation is performed by a close-coupled acoustic array through a water path. Weapon motion is simulated in real time, closed-loop, based on steering and speed commands. This simulated motion also provides necessary geometries to the computer-driven target generator. UWEF includes systems for on-line, real-time data acquisition and display, propulsion performance measurement, closed-loop autopilot stimulation, logistic support, safety, and propulsion by-product removal.

**2. Indicate whether the facility/equipment is portable, moveable or fixed as defined by paragraph 6, 12 of this data call.**

The UWEF equipment is fixed. Relocation would require more than \$13 million to remove the pressure vessel, steam plant, storage tanks, pumps, and piping as well as the control, display, and simulation electronics and computer systems, and reinstall, reintegrate, and check out the system in a like facility. These prohibitive relocation costs include new foundations, special utilities, and a building to enclose the test system. From a utilization standpoint, UWEF is an integral part of the overall undersea weapon T&E capability, which is a major mission area at Keyport. As such, relocation of UWEF would adversely impact the ability of Keyport to carry out that mission area effectively and efficiently.

**3. Provide the replacement value of the facility/equipment. Report the facility/equipment cost separate from any building and utilities that may be integral to the facility/equipment.**

The replacement cost of the test capability is estimated at \$20 million excluding the costs to construct a building. Construction costs for a suitable building with appropriate utilities and special fixtures are estimated at \$3 million.

**4. Provide the gross weight and cube of the facility/equipment.**

Volume of the facility is 82,584 cubic feet, and the weight and volume of the UWEF System are 286,300 pounds and 22,017 cubic feet, respectively. This is comprised of: pressure vessel - 160,000 pounds and 4,533 cubic feet; hazardous waste tanks - 40,000 pounds and 6,800 cubic feet; water storage tanks - 23,000 pounds and 5,500 cubic feet; steam source - 11,900



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pounds and 976 cubic feet; exhaust burner - 50,000 pounds and 3,680 cubic feet; and 3-axis motion table - 1,500 pounds and 528 cubic feet.

**5. Indicate any "special" utility support required by this facility/equipment other than normal electrical power.**

This facility requires 500 KVA, 450V, 3-phase electrical power; natural gas at 40M BTU/hr; 100 psi 600 cfm compressed air; and a sewer connection at 150 gpm.

**6. Indicate any special budget requirements for the facility/equipment (i.e., special foundations, non-ferrous materials, shielding, hardening, etc.).**

The Undersea Weapon Evaluation Facility is in place and has no special budget requirements for its operation. However, relocation of UWEF would require a MILCON as well as significant budget expenditures to move the major equipment items.

Special budget items required for relocation of the facility/equipment include: foundations for the test chamber vessel and for each of the test water storage and hazardous waste tanks (20,000 to 50,000 gallons each); a MILCON for a structure having a computer room, including air conditioning; covered secondary containment for the pressure vessel; weapon handling area with 10-ton crane; and a complex system of foundations and trenches to support the water handling system. The facility utilizes specialized containment systems for hazardous liquid overflow. It also incorporates a system to properly dispose of hazardous gas and liquid by-products resulting from testing operations (see question 7). The facility is hardened to allow testing and handling of SECRET hardware. If relocated, a new facility would require all of these features.

**7. State any environmental control requirements for the facility/equipment (i.e., temperature, humidity, air scrubbing).**

This facility/equipment incorporates essential temperature and humidity control for the computer spaces and temperature control for the water used for vehicle testing in the pressure vessel. UWEF also utilizes a mandatory afterburner to process the byproducts resulting from vehicle engine operation while under test. This afterburner passes the necessary air quality permitting for operation. UWEF also utilizes another NUWC Division, Keyport facility with appropriate environmental permits to store and process large volumes of contaminated test water containing weapon fuels and byproducts which can result from test anomalies.

**8. Indicate if this facility/equipment would be extremely difficult or impossible to replicate or relocate at another site and the impact to the Department of the Navy if this**



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**facility/equipment were lost. Consider existing Government-wide and commercial capabilities as the replication and impact statements are formulated.**

UWEF would be extremely difficult to move, in that it is a massive, thick-walled steel pressure vessel weighing in excess of 143 tons. If this facility were lost, the Navy would lose one of its most productivity enhancing cost-effective, one-of-a-kind systems. There is no comparable system in the nation which provides comprehensive weapon acceptance testing, troubleshooting, system integration, pre-range checkout, and production verification. It is used in conjunction with the Northwest Underwater Test Range System to yield the most comprehensive undersea weapon testing capability in the world.

**9. Indicate how and when the facility/equipment was transported and or constructed at the site.**

The present building was modified in 1984 to accommodate UWEF by providing containment and foundations for the pressure vessel and other major systems, as well as specialized computer facilities. The pressure vessel (in pieces) and the system components were constructed in Boston, Massachusetts; Annapolis, Maryland; Decatur, Illinois; and Seattle, Washington and integrated on site at Keyport during the time period 1986 to 1989. Additional components were fabricated in State College, Pennsylvania, and integrated into the system between 1989 and 1993. The remaining components were fabricated on-site.

**10. List the functional support areas (previously provided in Tab A) that this facility/equipment support. Refer to Appendix A for the list of Functional support areas.**

Functional support areas are:

- 2. Weapons Systems
  - 2.4 Torpedoes
- 8. Defense Systems
  - 8.2 Countermeasures

**11. Provide the historical utilization average for the past five fiscal years (1989-1993). Define the unit of measure used.**

The historical utilization average was 15.6 tests per year during a period of system development, integration, and upgrade which restricted UWEF availability for testing.



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**12. Provide the projected utilization data out to FY 1997.**

Projected utilization is 150 tests per year, including both self-powered vehicle tests and un-powered tests through 1997.

**13. What is the approximate number of personnel used to operate the facility/equipment?**

Four people are required to operate the test facility.

**14. What is the approximate number of personnel needed to maintain the equipment?**

Two people are required to maintain the system.

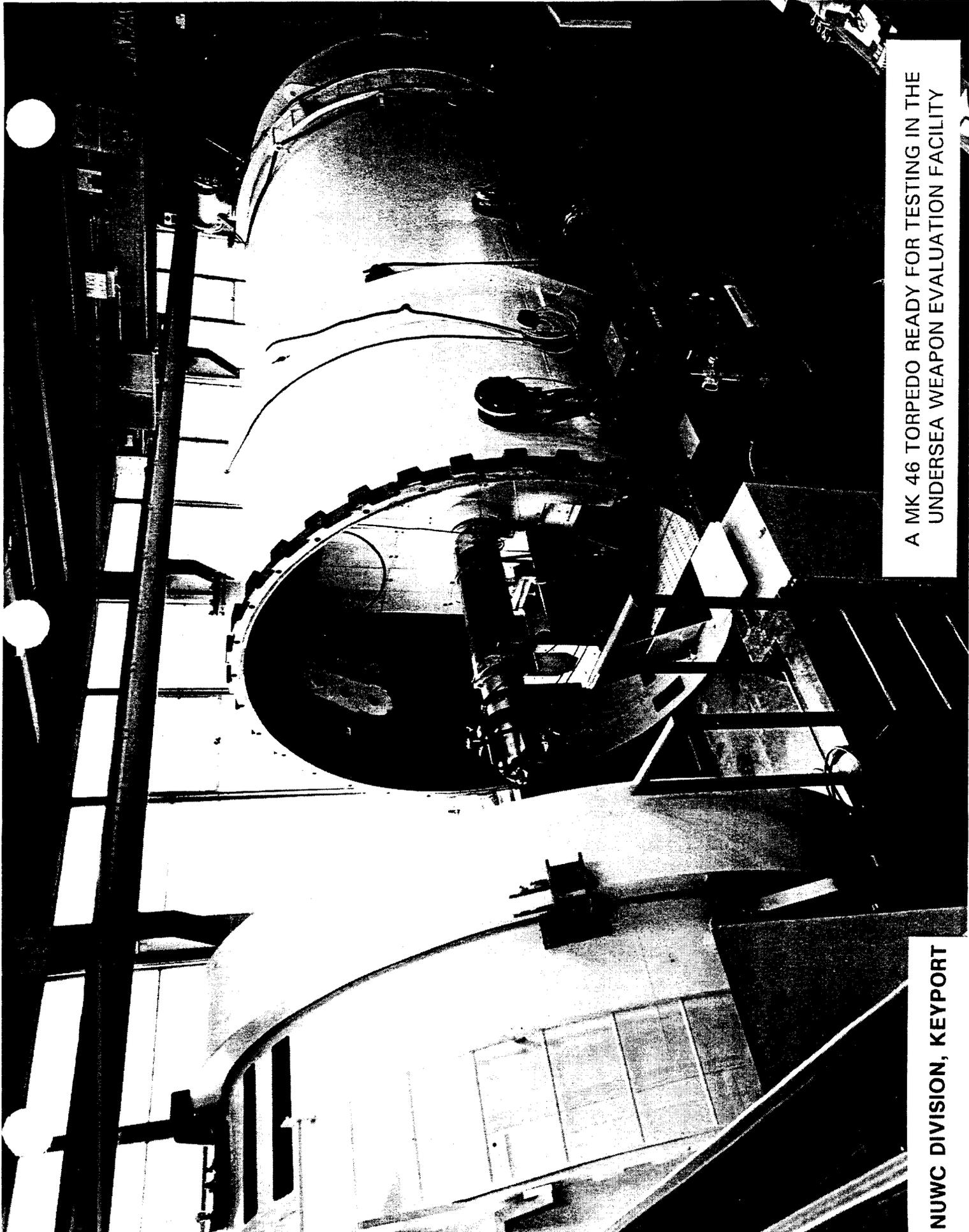
**15. Provide one 8 1/2 X 11 black and white photo of the facility/equipment.**

See Attached.



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A MK 46 TORPEDO READY FOR TESTING IN THE UNDERSEA WEAPON EVALUATION FACILITY

NUWC DIVISION, KEYPORT

**SPECIAL FACILITIES AND EQUIPMENT  
FACILITIES/EQUIPMENT CAPABILITY FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Facility/Equipment Nomenclature or Title	Torpedo Explosive Operating Complex (8 buildings)

**1. State the primary purpose(s) of the facility/equipment.**

This highly specialized Torpedo Explosive Operation Complex provides Ready-For-Issue explosive assembly, disassembly, and repair of all undersea weaponry currently in the active U.S. Naval inventory systems. This complex is an integral part of the Navy's only torpedo repair depot. It is supported by highly skilled technical personnel with over 1280 years of specialized experience in explosive ordnance operations.

These facilities, because of their unique explosive safety requirements, have been sited within the same Explosives Safety Quantity Distance (ESQD) arcs as their adjacent torpedo storage magazines. This provides maximum safety and minimizes the transportation costs associated with the torpedo depot repair process.

**2. Indicate whether the facility/equipment is portable, moveable or fixed as defined by paragraph 6, 12 of this data call.**

All of these facilities are fixed.

**3. Provide the replacement value of the facility/equipment. Report the facility/equipment cost separate from any building and utilities that may be integral to the facility/equipment.**

Facilities - \$6.1M.

Equipment cost exceeding \$500K - \$18.4M.

Note: Facility cost figures do not include land acquisition necessary to support required Explosive Safety Quantity Distance standards (ESQD Arc).

**4. Provide the gross weight and cube of the facility/equipment.**

Total facilities cubic feet - 423,000.



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**5. Indicate any "special" utility support required by this facility/equipment other than normal electrical power.**

- (a) Air Pressure (Low Pressure)
- (b) Ordnance Ground
- (c) Lightning Protection System

**6. Indicate any special budget requirements for the facility/equipment (i.e., special foundations, non-ferrous materials, shielding, hardening, etc.).**

These are explosive operating facilities which require and are constructed to current standards for explosive safety related issues.

**7. State any environmental control requirements for the facility/equipment (i.e., temperature, humidity, air scrubbing).**

Temperature and humidity controlled environment. Air make-up units where required.

**8. Indicate if this facility/equipment would be extremely difficult or impossible to replicate or relocate at another site and the impact to the Department of the Navy if this facility/equipment were lost. Consider existing Government-wide and commercial capabilities as the replication and impact statements are formulated.**

Extremely difficult/costly to relocate. If facility/equipment is lost, the impact would eliminate the Navy's only west coast site capable of handling all explosive operations for associated torpedo and undersea weapons systems. In today's environment, constructing explosive operating facilities elsewhere would be extremely difficult due to Explosive Safety Quantity Distance standards requirements, increasing population, lack of suitable construction sites within a coastal region, lack of deep water pier access, and severe funding constraints. In the event these facilities were lost to the Navy undersea weapons community, transportation costs to/from associated maintenance facilities would be prohibitive and would severely impact Fleet support. No existing commercial capabilities exist.

**9. Indicate how and when the facility/equipment was transported and or constructed at the site.**

Facilities were originally constructed during the 1944 timeframe as explosive storage magazines. Conversion of the magazines to explosive operating buildings began in the mid-1970's and continued until 1990.



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**10. List the functional support areas (previously provided in Tab A) that this facility/equipment support. Refer to Appendix A for the list of Functional support areas.**

- 2. Weapons Systems
  - 2.4 Torpedoes
- 8. Defense Systems
  - 8.2 Countermeasures

**11. Provide the historical utilization average for the past five fiscal years (1989-1993). Define the unit of measure used.**

Historical utilization average for the past five fiscal years (1989 through 1993) is 100%.  
Unit of Measurement: Scheduled Production Time based on 5-day, one-shift operation.

**12. Provide the projected utilization data out to FY 1997.**

Projected utilization to FY 97 is 89% based on current scheduled requirements.

**13. What is the approximate number of personnel used to operate the facility/equipment?**

To operate the identified facilities requires 57 employees.

**14. What is the approximate number of personnel needed to maintain the equipment?**

To provide maintenance support for these facilities requires 4 personnel.

**15. Provide one 8 1/2 X 11 black and white photo of the facility/equipment.**

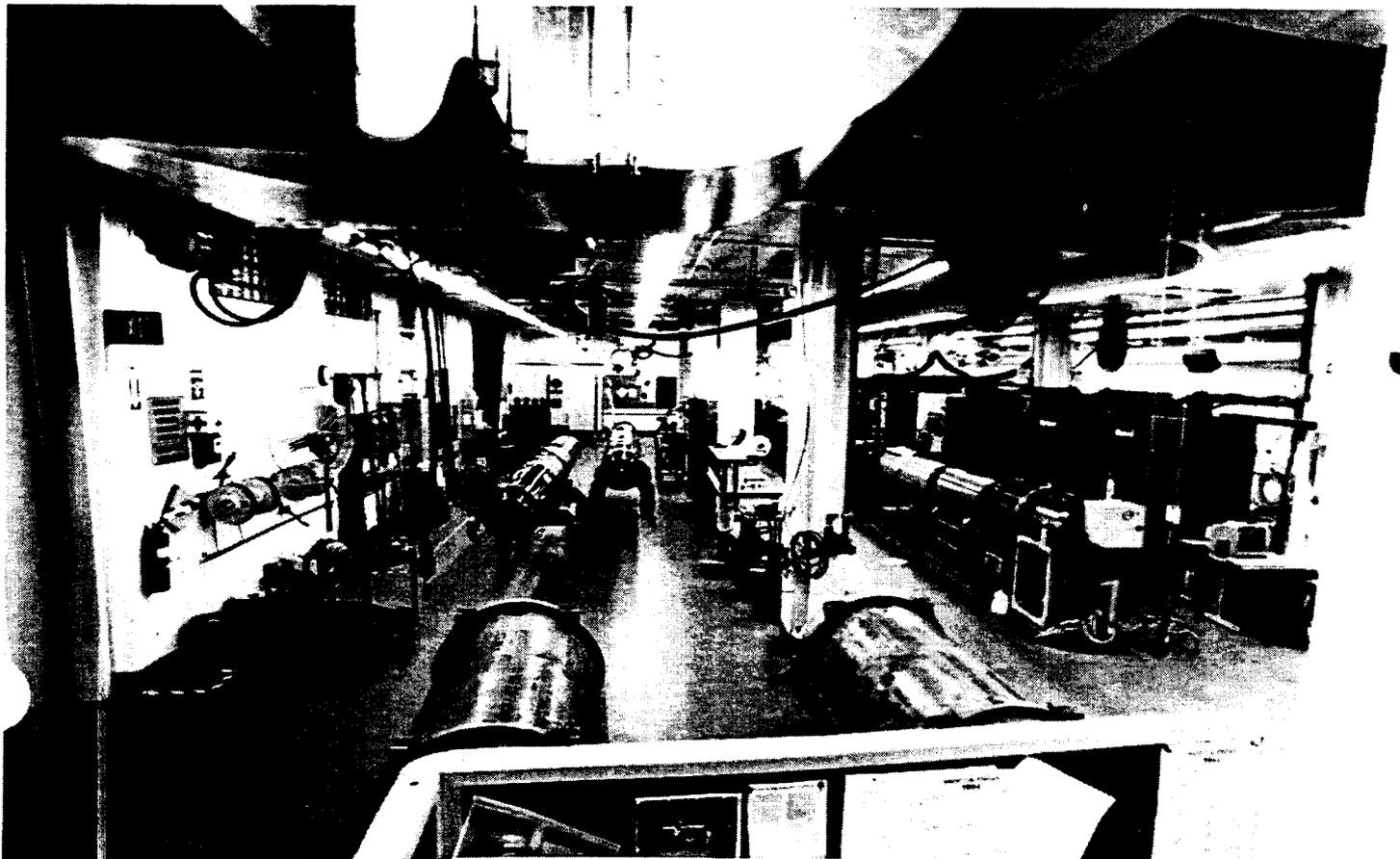
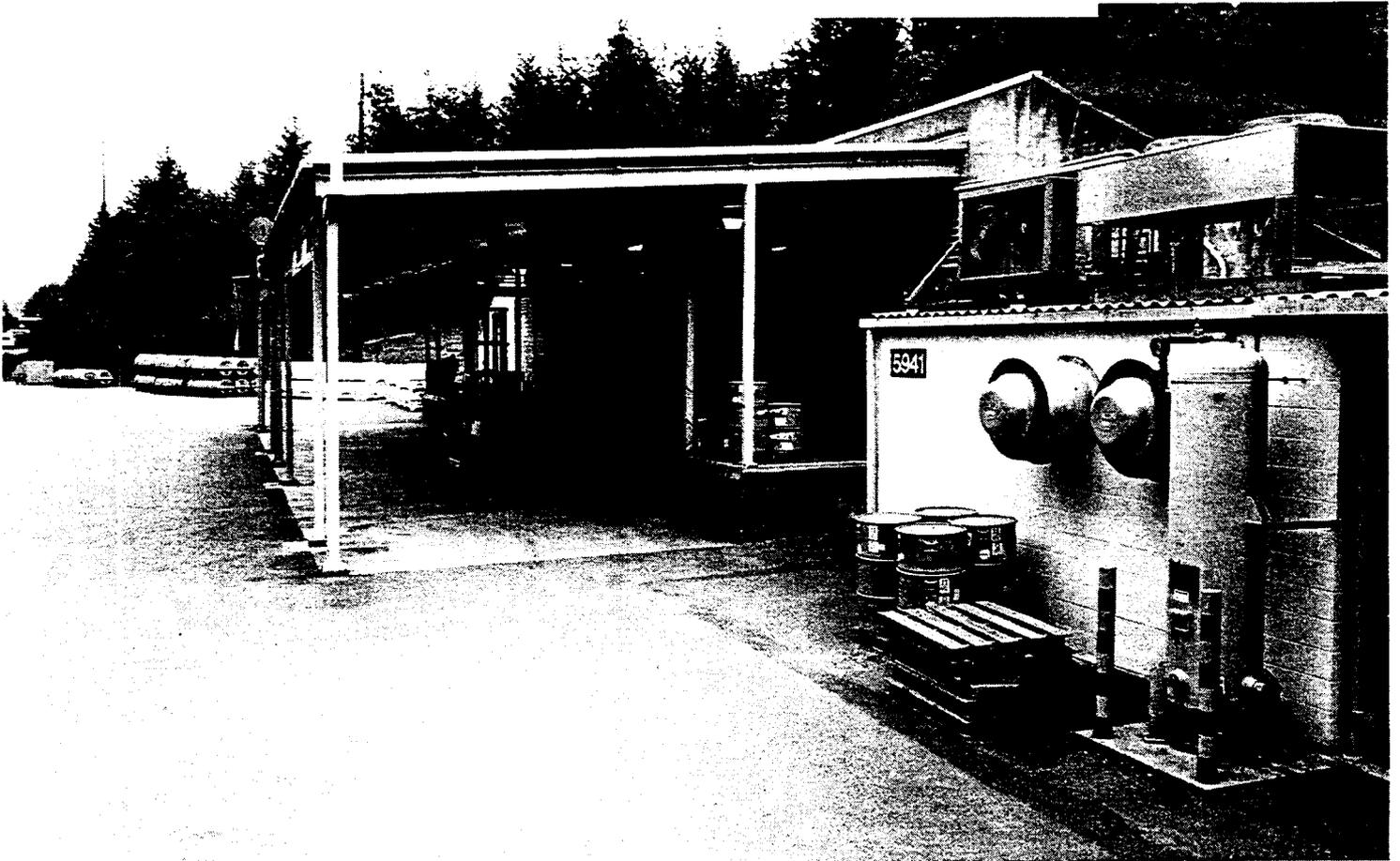
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**TORPEDO EXPLOSIVE OPERATING COMPLEX**



**NUWC DIVISION, KEYPORT**

**SPECIAL FACILITIES AND EQUIPMENT  
FACILITIES/EQUIPMENT CAPABILITY FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Facility/Equipment Nomenclature or Title	Torpedo Storage Magazines  These facilities consist of 72 specially constructed earthcovered unbarricaded, fragmentation hazard magazines

**1. State the primary purpose(s) of the facility/equipment.**

The 72 magazines at the Naval Undersea Warfare Center Division, Keyport's Undersea Warfare Annex constitute the Navy's only resource for consolidation and storage of torpedoes being laid-up or "bunkered" as a result of reductions in Fleet platforms. The storage function is supported by highly skilled technical personnel with a combined total of over 1,175 years of specialized experience in explosive ordnance storage and handling. Of the more than 10,000 MK 46 lightweight torpedoes in the Navy's inventory, approximately 5,000 will be laid-up, stored as piece parts, or undergo conversion in the next few years. Furthermore, the U.S. Navy's entire MK 48 heavyweight torpedo inventory will be "bunkered" or stored in a "not ready for issue" condition in the magazines of the Undersea Warfare Annex. These magazines are dedicated to torpedo storage and as such, represent the only explosive torpedo storage facilities available to accommodate this many torpedoes. In the event of war, the magazines of the Undersea Warfare Annex are colocated with Ready for Issue (RFI) and warhead maintenance facilities and are contiguous to the torpedo depots, torpedo Intermediate Maintenance Activities, and light industrial support facilities of Naval Undersea Warfare Center Division, Keyport. This will allow reconstitution of these torpedo assets, providing the Navy with immediate surge capacity and timely second strike load out capability. The magazines and explosive operating facilities of the Undersea Warfare Annex represent an asset that can not be replicated in the private sector due to: (1) cost to duplicate, (2) lack of waterfront real estate and pier facilities, (3) lack of requisite Explosive Safety Quantity Distance arcs, and (4) lack of required environmental support facilities for fueling and hazardous waste.

**2. Indicate whether the facility/equipment is portable, moveable or fixed as defined by paragraph 6, 12 of this data call.**



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The facilities are fixed.

**3. Provide the replacement value of the facility/equipment. Report the facility/equipment cost separate from any building and utilities that may be integral to the facility/equipment.**

Replacement value is \$47.9M.

Cost does not include land acquisition necessary to support required Explosive Safety Quantity Distances standards (ESQD Arc). Cost does not include permitting and siting.

**4. Provide the gross weight and cube of the facility/equipment.**

Gross Weight - n/a

Total Cubic Feet - 4.7M

**5. Indicate any "special" utility support required by this facility/equipment other than normal electrical power.**

n/a

**6. Indicate any special budget requirements for the facility/equipment (i.e., special foundations, non-ferrous materials, shielding, hardening, etc.).**

These magazines are constructed with grounding protection.

**7. State any environmental control requirements for the facility/equipment (i.e., temperature, humidity, air scrubbing).**

n/a

**8. Indicate if this facility/equipment would be extremely difficult or impossible to replicate or relocate at another site and the impact to the Department of the Navy if this facility/equipment were lost. Consider existing Government-wide and commercial capabilities as the replication and impact statements are formulated.**

In today's environment, constructing explosive storage magazines would be extremely difficult due to increasing population (which precludes siting with appropriate "buffer zones" for explosives safety), lack of suitable construction sites within a coastal region, and severe funding constraints. In the event these facilities were lost to the Navy undersea weapons community transportation costs to/from maintenance facilities would be prohibitive and would severely impact Fleet support. No existing commercial capabilities exist. Government-wide



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capabilities to replace Undersea Warfare Annex explosive magazines is extremely limited due to Explosive Safety Standard requirements as stated above.

**9. Indicate how and when the facility/equipment was transported and or constructed at the site.**

Facilities were constructed from 1944 through 1953.

**10. List the functional support areas (previously provided in Tab A) that this facility/equipment support. Refer to Appendix A for the list of Functional support areas.**

- 2. Weapons Systems
  - 2.4 Torpedoes
  - 2.5 Mines
- 7. Command Control, Communications and Intelligence
  - 7.1 Submarines
- 8. Defense Systems
  - 8.2 Countermeasures

**11. Provide the historical utilization average for the past five fiscal years (1989-1993). Define the unit of measure used.**

Historical utilization average for the past five fiscal years (1989 through 1993.)  
Unit of Measurement: Torpedo storage capacity is 35%.

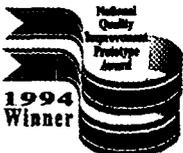
**12. Provide the projected utilization data out to FY 1997.**

Projected utilization to FY 97 is 82% based on projected torpedo storage requirements.

Note: Significant utilization increase in the out-years is based on firm torpedo program plans for bunkering, layup, and deep storage which results from Fleet platform reductions.

**13. What is the approximate number of personnel used to operate the facility/equipment?**

Number of personnel to operate facility: 54.



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**14. What is the approximate number of personnel needed to maintain the equipment?**

Number of personnel to maintain equipment: 2.

**15. Provide one 8 1/2 X 11 black and white photo of the facility/equipment.**

See attached.



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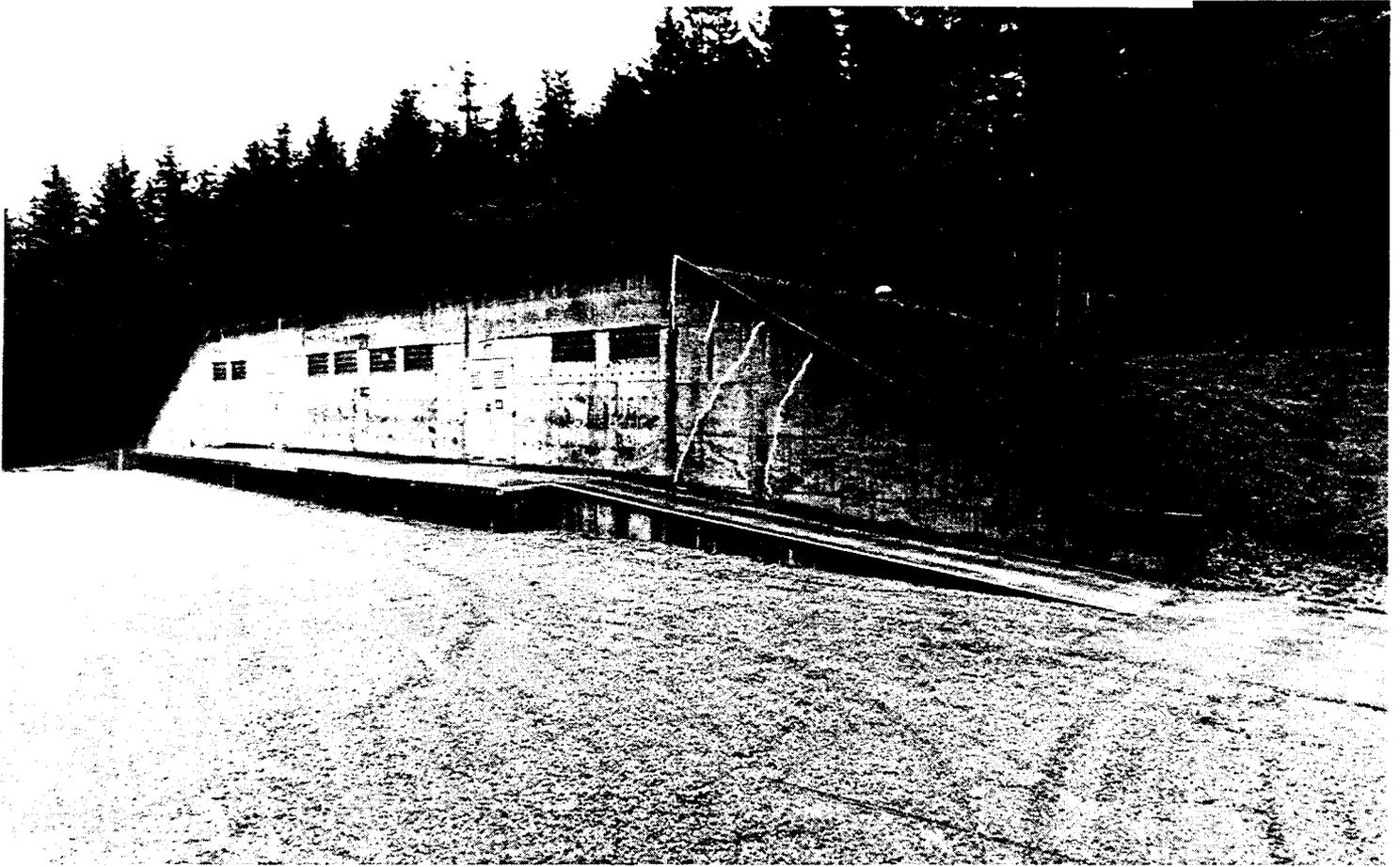
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**TORPEDO STORAGE MAGAZINES NUWC DIVISION, KEYPORT**



**NUWC DIVISION, KEYPORT**

**SPECIAL FACILITIES AND EQUIPMENT  
FACILITIES/EQUIPMENT CAPABILITY FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Facility/Equipment Nomenclature or Title	Hardware Environmental Test Facility

**1. State the primary purpose(s) of the facility/equipment.**

The Hardware Environmental Test Facility consists of four test laboratories, each specifically equipped for one of the four major test functions of dynamic/climatic testing, mechanical testing, electrical testing, and explosive testing. It is supported by skilled engineers and technicians with a combined total of over 750 years of experience in the highly specialized field of hardware environmental stress testing. The primary role of the facility is testing Naval undersea weapons, targets, mines, countermeasures, and combat systems, but the services and equipment provided by the facility also support other agencies and weapon systems. This facility is integral to, and critical in, supporting the Warfare Center mission areas of Depot Repair and Maintenance, Test and Evaluation, and In-Service Engineering for Undersea Weapons and Combat Systems by providing essential test resources.

a. **Dynamic and Climatic Test.** The Hardware Environmental Test Laboratory provides the capability to perform both operational and non-operational testing of hardware combined with shock, vibration, temperature, acceleration, humidity, pressure, and salt spray environments. These services support the Naval Undersea Warfare Center Division, Keyport mission area of underwater weapons systems quality test and evaluation, as well as depot and weapon industrial mission areas. The size and scope of test capabilities of the facility makes it one of the largest and most complete dynamic and climatic testing laboratories in the Navy and gives it the ability to test an extremely wide range of devices from small electronic and mechanical components to All-Up Round (AUR) torpedoes and other weapons and countermeasures. The facility is the only government facility of its kind in the Pacific Northwest. Within a 60-mile radius are many defense activities, contractors, non-defense activities, and private parties who use its services.

Dynamic and Climatic laboratory testing simulates operational conditions experienced by hardware in real-world dynamic and climatic environment. Its purpose is to qualify new hardware designs and systems in development, evaluate procurement production processes, screen depot repairs and upgrades for workmanship defects, and duplicate and diagnose intermittent failures that occur in field operation. The facility includes the only existing



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capability to vibrate an entire heavyweight ADCAP torpedo in its shipping container and to accelerate a MK 46/50 torpedo to 50 g's on a centrifuge having a 25 foot radius arm. Maximum payload for this centrifuge is 1000 pounds.

The dynamic and climatic test laboratory can provide thermal environments ranging from -200 degrees to +400 degrees fahrenheit in chambers as large as 7 ft x 7 ft x 21 ft. Other chambers can provide relative humidities between 10 percent and 95 percent, while facility altitude chambers can replicate altitudes from sea level to 100,000 ft. The vibration test systems (shakers) in this laboratory can provide up to 100 g's and 30,000 pounds over the frequency range of the 5 Hz to 2,000 Hz. Multiple shakers have been successfully used in tandem to excite an entire MK 48 ADCAP torpedo weight over 3,500 pounds. The mechanical shock test capability ranges up to 180,000 g's and payloads range to 4,500 pounds.

The Dynamic/Climatic Test Facility consists of:

- 10 large vibration excitation machines.
- 60 climatic, salt spray, and altitude chambers and pressure vessels.
- 12 mechanical shock testing machines.
- 21 electronic and functional test sets.
- 3 centrifuges for steady-state acceleration testing.

b. **Mechanical Test.** The Mechanical Test Laboratory is used to perform functional (operational) tests on valves, pumps, actuators, alternators, turbines, gearboxes, engines, and other mechanical components, particularly those used in torpedoes and other undersea vehicles. The functional tests can be run at the operational endurance limits of the test items under a variety of environmental conditions to evaluate operability and reliability by simulating actual operating conditions. A wide variety of hardware can be tested using adaptive test stands and computer controls to adapt to variable requirements. The facility includes elaborate systems to measure and record the performance of the items under test. Many of the test systems are automated. All types of fueled torpedo and undersea vehicle engines can be operated and tested in this laboratory, which includes a steam turbine test cell and Otto fuel engine test cells equipped with appropriate dynamometer test stands, energy sources, and by-product handling and disposal systems. The mechanical test laboratory can test open cycle thermal engines ranging to 750 horsepower, steam turbines to 350 horsepower, and pumps to 100 horsepower and 3,400 RPM.

c. **Electric/Electronic Test.** The Electric/Electronic Test Laboratory consists of three test complexes, each specifically equipped for one of the major functions of battery testing, electric motor testing, and electronic circuit components and assembly testing.



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The electric battery testing laboratory has the capability of testing high-performance primary and secondary electro-chemical systems as individual cells or as complete battery systems. Sizes from small AA mercury-oxide/zinc cells to large 24,000 watt-hour silver-chloride/magnesium batteries can be accommodated. Loads can be varied up to 1 megawatt. Testing is performed in explosive-capable test cells with blow-out walls.

The motor test laboratory conducts functional testing of electric motors. Testing is performed on four dual-dynamometer, counter-rotating-shaft test beds of differing power ratings. Test stands are equipped with necessary performance measuring equipment to handle both single and counter-rotating motors up to 350 horsepower and 4,000 RPM.

The electronic circuits testing laboratory conducts functional operational testing of electronic components, subassemblies, and complete assemblies. Computerized test sets control parameters at the margins of endurance and allow electronic operation to be timed for combined environmental test cycles. The laboratory is the only one in the Navy with specialized test sets that combine functional electronic tests on all torpedo assembly components with environments such as vibration, shock, and temperature cycling. Many test sets are one-of-a-kind developed at NUWC Division, Keyport.

d. **Explosive Test.** The Explosive Test Laboratory supports a full spectrum of weapon production and in-service evaluation programs. The primary purpose of this facility is the test and evaluation of explosive devices from small electro-explosive devices and squibs up through and including arming devices, propellant charges, bomb fuzes, and large warheads. This laboratory supports Air Force and Marine Corps, as well as Navy, projects and programs. The explosive test laboratory includes hardened test cells with specialized equipment to test and measure the performance and safety of explosive devices. A specialized cell is equipped to perform remote handling and machining operations for inspection and analysis, including trouble-shooting of explosive devices. This facility also includes a specialized cell and radiation sources for high-energy radiography of very thick, dense items, such as warheads, to determine the physical condition of the explosives.

2. **Indicate whether the facility/equipment is portable, moveable or fixed as defined by paragraph 6, 12 of this data call.**

This facility is 80% fixed and 20% moveable as shown below. Anything beyond this figure would require exorbitant expenses that are beyond budget limitations.

a. **Dynamic and Climatic Test.** Most of the dynamic and climatic test equipment is not portable. However, it could be relocated, which would require special budgets for utilities and construction. Special foundations would be needed to isolate vibration and mechanical



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shock between machines and from the rest of the facility. Noise-suppression construction would be required to isolate shock and vibration systems. The centrifuge system is integrated into a fixed 60 foot diameter permanent structure and cannot be moved.

b. **Mechanical Test.** The mechanical test laboratory structure is fixed. The engine test cells are fixed facilities. The steam turbine test cell requires a fixed, high volume and pressure steam plant with valving and plumbing built into the facility. The Otto fuel test facility includes an integrated high-pressure, temperature-controlled water cooling tank system; pumps, valves, and plumbing; special large foundations; engine test stands; engine exhaust burner; liquid hazardous waste collection system; and integrated data collection system.

c. **Electric/Electronic Test.** The equipment that constitutes the electric/electronic test laboratory is, in and of itself, moveable; however, much of this equipment is used in conjunction with dynamic/climatic test equipment to emulate service-life conditions. Therefore, any relocation must include the dynamic/climatic test laboratory as well.

d. **Explosive Test.** The Explosive Test Laboratory consists of two fixed, non-moveable structures of reinforced concrete walls as much as 16 inches thick. The purpose of one structure is to provide 10 explosive test cells with frangible/blow out walls and explosion proof viewing ports. The purpose of the other structure is to contain high energy x-ray emissions. The facility includes specialized 40-foot drop towers that are fixed. The equipment in this laboratory is considered fixed. An exorbitant expense associated with moving the equipment would be in siting the laboratory and in the construction of the radiation and explosion-resistant structure, as well as the necessity of obtaining new Nuclear Regulatory Commission licenses for the radiographic equipment.

**3. Provide the replacement value of the facility/equipment. Report the facility/equipment cost separate from any building and utilities that may be integral to the facility/equipment.**

The replacement value for all of the equipment and special budget requirements which constitute the Hardware Environmental Test Facility is \$42.2 million plus an additional \$16.5 million for MILCON.

**4. Provide the gross weight and cube of the facility/equipment.**

The buildings housing the Dynamic/Climatic Test Laboratory cover a total of 38,172 square feet. Most of this area is high-bay at an average height of 30 feet. The vibration equipment weighs 10 to 40 tons apiece and measures 250 to 1,000 cubic feet. Climatic chambers weigh 100 to 20,000 pounds and measure 27 to 2,900 cubic feet, and shock machines weigh 1 to 11 tons and measure 60 to 100 cubic feet. The largest of the centrifuges weighs 35 tons and



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occupies a volume of 31,000 cubic feet and an area of 2,600 square feet. The Mechanical Test laboratory equipment encompasses a total volume of 75,000 cubic feet and equipment weight of 62.7 tons. The electric/electronic equipment weight is approximately 14 tons, and the volume is 25,700 cubic feet. The explosive test laboratory equipment weighs approximately 24 tons, occupies roughly 27,000 square feet, and has a volume of 540,000 cubic feet.

**5. Indicate any "special" utility support required by this facility/equipment other than normal electrical power.**

a. **Dynamic and Climatic Test.** The Environmental Test Laboratory requires 500 KVA, 450V, 3-phase electrical power; an average of 25,000 gallons of water per hour and a peak of 50,000 GPH; 120 psi and 3,000 psi air; and air conditioning for 90,000 cubic feet of space. The large centrifuge requires an additional 200 KVA, 450 volt, 3-phase power and 100 GPM cooling water.

b. **Mechanical Test.** The mechanical test laboratory consumes 5,000 gallons of propane per year and 3,000 psig air at low volume.

c. **Electric/Electronic Test.** The electrical test laboratory power requirements are 750 KVA, necessary for the motor test laboratory. Additionally, the availability of natural salt water in large quantities is required to conduct operational tests of batteries which use seawater as the electrolyte.

d. **Explosive Test.** The explosive test laboratory requires an elaborate rounding system for safety while working with explosives, as well as a complete lightning protection system.

**6. Indicate any special budget requirements for the facility/equipment (i.e., special foundations, non-ferrous materials, shielding, hardening, etc.).**

The Hardware Environmental Test Facility has no special budget requirements for present operations. All required permits and special features are in place. However, if the facility were relocated, significant expenses, including MILCON, would accrue for the replacement of these items.

a. **Dynamic and Climatic Test Laboratory.** Special budget requirements for the relocation of Dynamic/Climatic laboratory include isolation foundations for each shock and vibration machine. The foundations are made of reinforced concrete that average 10x15x5 feet and are mounted on air supports. Also required is noise suppression for an average of 105 ADB continuous noise from vibration testing and 82 ADB of impact noise from shock



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testing. The entire centrifuge building is a functional part of the centrifuge. Extensive building foundation is required to anchor the centrifuge arm during operation.

b. **Mechanical Test.** For the mechanical test laboratory, the engine exhaust burner requires, and has in place, an environmental permit and a double-walled waste/hazardous liquid handling and collection system with leak sensors. The Otto fuel engine test system resides in a hardened site, with a secondary containment system for Otto fuel handling, storage, and containment. Ordnance grounds are required and also are in place. Water tanks must be kept in an area above freezing temperatures.

c. **Explosive Test.** The explosive test laboratory requires hardening and shielding which is provided by high density walls, and over-pressure relief as provided by blowout walls. The radiography cell must also provide appropriate levels of protection to personnel against high-energy radiation. The fuze test drop tower must be constructed completely of non-magnetic materials with a special grid system target area. The impact pad on the 40 ft. drop tower is required to have a 3 inch minimum thickness steel plate of a specified hardness attached to a special concrete foundation at least 18 inches thick. The test cell contains inner walls that consist of 16 inch heavily reinforced concrete, and corresponding heavy foundations. The walls are also covered on the inside with steel plate to prevent spalling in the event of an explosion.

**7. State any environmental control requirements for the facility/equipment (i.e., temperature, humidity, air scrubbing).**

The dynamic/climatic test laboratory requires air conditioning for 70,000 cubic feet of computer and functional test set spaces and chilling for cooling water in high volumes to cool vibration systems and climatic test chambers. The Dynamic/Climatic Test Laboratory requires special permits for testing components containing small amounts of energetic material, as well as for handling residual air and waste water contaminated with oils, solvents, fuels, and materials such as lithium by-products. The Mechanical Test Laboratory requires air conditioning and a fluid heating and cooling system for many tests. Environmental permits and controls are also necessary for properly disposing of engine exhaust products and hazardous liquid residuals. The Electric/Electronic Test Laboratory test cells require the capability of containing the by-products of batteries which become thermally unstable, resulting in rapid discharge, physical cell separation, and conflagration. The Explosive Test Laboratory requires fume hoods for some explosive analysis procedures and hazardous waste disposal equipment for certain explosive operations.

**8. Indicate if this facility/equipment would be extremely difficult or impossible to replicate or relocate at another site and the impact to the Department of the Navy if this**



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**facility/equipment were lost. Consider existing Government-wide and commercial capabilities as the replication and impact statements are formulated.**

a. **Dynamic and Climatic Test.** Most of the Dynamic/Climatic Test Laboratory and equipment would be extremely difficult to relocate to another site and would require special site modifications, utilities, and environmental permits mentioned above and in number 9 below. Relocation costs would be at least \$5 million dollars, not including the cost to construct a building to house the equipment. That construction cost would add \$5 million. The impact to the Navy during the 18-24 month period for relocation would be the temporary loss of one of its largest and most capable Dynamic/Climatic Test Laboratories and the only Hardware Environmental Test Facility that is locally available to support NUWC Division, Keyport in the evaluation of undersea weapons and related parts procured by the Navy. Loss of the facility would be severe to Navy. This is the only Dynamic/Climatic Test Facility in the nation for torpedoes. Therefore, its loss would have severe consequences for the torpedo industry with respect to acceptance testing and for future acceptance testing of major torpedo modification programs. There is no other general-purpose centrifuge with as large a test package capacity as the 25-foot unit at Keyport. In addition to its normal work load, this equipment has been used to test packages for military aircraft hardware, NASA space programs systems, and commercial aviation equipment.

b. **Mechanical Test.** Parts of the Mechanical Test Laboratory would be extremely difficult to relocate due to the environmental controls and safety and technical integration considerations required. Some of the test cells must be of hardened construction for propulsion system testing. Replicating existing environmental operating permits would be increasingly difficult given heightened national environmental regulations for engine exhaust treatment/discharge systems and for waste water treatment/reclamation. The cost to relocate this laboratory would be approximately \$2.8 million. The impact to the Navy if this laboratory were lost is severe in that NUWC Division, Keyport is the only Navy torpedo depot in the nation.

c. **Explosive Test.** Aside from the cost of the structure itself, which would be approximately \$4.5 million, the major difficulties associated in relocating the existing Explosive Test Laboratory would be the necessary site approval for the explosives being tested. This is a long and involved process that requires extensive studies to be completed. There are very few sites that meet the operational requirements. In addition to site approval requirements are the associated NRC regulations. The impact to the Navy if this laboratory were lost is severe in that NUWC Division, Keyport is the only Navy torpedo depot in the nation.



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**9. Indicate how and when the facility/equipment was transported and or constructed at the site.**

The Hardware Environmental Test Facility is located primarily in two buildings at NUWC Division, Keyport. One building was modified exclusively for environmental testing in 1960, and the other building was modified and upgraded exclusively for environmental testing in 1971. The bulk of the equipment located in these two buildings was originally procured between 1960 and 1972 and sited in tailor-made test cells and/or on special foundations. The equipment has been completely replaced or upgraded in-place since originally installed. The centrifuge was constructed in 1968. The mechanical test laboratory is housed in two building complexes. One building was constructed and equipped in 1987 specifically for steam propulsion testing. The other is a concrete building constructed in 1972 specifically for Otto fuel engine testing. It has been upgraded several times since 1972, and the environmental controls were completely replaced or upgraded in 1993. The electric/electronic test laboratory became operational in 1962. The explosive test laboratory was built in 1975.

**10. List the functional support areas (previously provided in Tab A) that this facility/equipment support. Refer to Appendix A for the list of Functional support areas.**

- 2. Weapons Systems
  - 2.4 Torpedoes
  - 2.5 Mines
  - 2.9 Fire Control
- 8. Defense Systems
  - 8.2 Countermeasures

However, the facility is capable of supporting all functional areas 1.1 through 8.3 and has supported most of those areas in the past.

**11. Provide the historical utilization average for the past five fiscal years (1989-1993). Define the unit of measure used.**

Historical utilization average of the Hardware Environmental Test Facility has exceeded 100 percent of its single-shift rated capacity with a workload of 35,900 tests per year.

**12. Provide the projected utilization data out to FY 1997.**



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Projected utilization of the Hardware Environmental Test Facility is expected to be 20,000 single-shift tests per year by 1997. The facility will be available to accommodate additional new work.

**13. What is the approximate number of personnel used to operate the facility/equipment?**

Sixty-two people are presently required to operate the Hardware Environmental Test Facility at maximum capacity, excluding staff and management.

**14. What is the approximate number of personnel needed to maintain the equipment?**

The equipment is maintained by the same people who operate it. Maintenance is a 7 workyear effort.

**15. Provide one 8 1/2 X 11 black and white photo of the facility/equipment.**

See Attached.



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**SPECIAL FACILITIES AND EQUIPMENT  
FACILITIES/EQUIPMENT CAPABILITY FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Facility/Equipment Nomenclature or Title	Transducer Automated Test Facility

**1. State the primary purpose(s) of the facility/equipment.**

The primary purpose of the Transducer Automated Test Facility (TATF) is to conduct rapid, automated in-water acoustic testing of Department of the Navy torpedo transducers. TATF is a land-based acoustic test facility specifically developed for high volume testing of torpedo planar arrays. It is operated and maintained by highly skilled technical personnel with a combined total of over 65 years of specialized acoustical testing experience. TATF is the U.S. Navy's newest, most automated torpedo nose array calibration facility, placed into operation in June 1992. TATF gives NUWC Division, Keyport a total repair capability for torpedo transducers, providing this Division's customers with a single activity meeting all of their needs in the area of torpedo transducer repair and test/calibration. NUWC will now be able to meet increased Fleet turnaround demands and effectively stabilize testing costs. TATF will provide production quantity testing of MK 46, MK 48, MK 48 ADCAP, and MK 50 Torpedo transducers into the 21st century.

Acoustic tests are conducted at TATF in accordance with the applicable weapons specifications. The automated system acquires data which includes transmit and receive beam patterns, receive sensitivities, stiffness parameters, and other acoustic and non-acoustic properties; computes and analyzes the various parameters; and compares the acquired data with the limits from the weapon specifications. A test report is generated by the computer at the completion of the test, defining all parameters compared to specification requirements; plotting all beam patterns, impedance curves, and sensitivities over the operating spectrum; and providing a summary of out-of-tolerance parameters. The complete report can be printed automatically at the conclusion of the test. Passing transducers can be placed in service in the Fleet, while failing transducers can be handled appropriately.

TATF testing supports depot-level production, range proofing and testing, and specialized testing of torpedo transducers to support other departments of NUWC Division, Keyport in its mission of undersea warfare. TATF also supports the Foreign Military Sales Office by conducting production-level testing of MK 46 and MK 48 Torpedo transducers for allied navies. Tests have already been conducted for the Canadian and Israeli Navies, and future



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plans include testing for countries such as Egypt, Australia, Brazil, France, Saudi Arabia, and others.

The acoustic tests are conducted in a 30-foot diameter by 30-foot high freshwater-filled, redwood tank. The water in the tank is filtered and conditioned. Temperature varies seasonally from about 12° C to 22° C. The structure above the tank houses the computer test suite areas, the assembly and storage area, and the operational area. MK 46, MK 48, and MK 50 nose arrays are mounted on a common positioning arm, which lowers the nose to a 15-foot depth for testing. Spacing between the test unit and standard is fixed at 5.1 meters. Alignment of the test hoist is achieved using a red laser mounted above the array with a target above the standard, providing a rotational accuracy of  $\pm 0.1^\circ$ .

Once the transducer is mounted and positioned in the tank, the entire test sequence is under automatic computer control, including the report preparation and printing. This high degree of automation has significantly reduced the time and cost of this type of standard calibration operation.

Instrumentation is centered around a Real Time Systems (RTS) three channel data acquisition system. Test signals are generated by the RTS, routed to an Instruments Incorporated L-10 power amplifier, and then either to the torpedo planar array or the standard as required by the test.

A 4-foot diameter graphite-epoxy pod is available for high pressure testing. The TATF pressure testing system is designed to test at pressures up to 2,000 lbs/in<sup>2</sup>. This gives the TATF the capability of testing MK 46, MK 48, and MK 50 Torpedo transducers at high pressure, simulating performance at extreme ocean depths.

TATF is very responsive to the testing needs of the depot and range testing due to its proximity to the depot and ranges. One day turnaround times on most tests are possible.

**2. Indicate whether the facility/equipment is portable, moveable or fixed as defined by paragraph 6, 12 of this data call.**

TATF is not readily portable, but it is moveable. Moving costs are estimated at over \$3 million. Moving TATF would require draining, disassembling, and reassembling a 160,000 gallon redwood tank; removing and reinstalling a robotic computer controlled transducer positioning arm and all hydraulic support systems; removal and installation of numerous delicate electronic instruments and software suites, other test equipment, and the entire Nose Array Test Set and manipulator arm. Relocation costs would include construction of a new suitable building to accommodate the 30-foot test tank, special utilities, and new foundation.



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**3. Provide the replacement value of the facility/equipment. Report the facility/equipment cost separate from any building and utilities that may be integral to the facility/equipment.**

The replacement cost of this test capability is estimated at \$5M, excluding building construction costs. Construction costs for a suitable building are estimated at \$500,000.

**4. Provide the gross weight and cube of the facility/equipment.**

The volume of the facility is 115,200 cubic feet (60x48x40). The weight (concrete pad + tank + buildings) is approximately 1.4M pounds.

**5. Indicate any "special" utility support required by this facility/equipment other than normal electrical power.**

The electrical power requirements are 44 KVA, 450 volts, 3 phase - 3 KVA of which is provided by uninterruptable power supply to the test equipment in the computer room.

**6. Indicate any special budget requirements for the facility/equipment (i.e., special foundations, non-ferrous materials, shielding, hardening, etc.).**

The 40-foot square concrete base foundation of the facility must support 1.4 million pounds. A 6-ton bridge crane and 15-foot robotic arm capable of two axes of rotation and lifting capacity of 600 pounds is required. A 30 foot diameter x 30 foot tall redwood tank with filter system is also needed. The facility must be hardened to allow testing and handling of SECRET hardware and data.

**7. State any environmental control requirements for the facility/equipment (i.e., temperature, humidity, air scrubbing).**

The computer room must have temperature and humidity control. Electrical power must be conditioned and uninterruptible. Water filtration systems are required for chemical and volume control of the 160,000 gallon test tank.

**8. Indicate if this facility/equipment would be extremely difficult or impossible to replicate or relocate at another site and the impact to the Department of the Navy if this facility/equipment were lost. Consider existing Government-wide and commercial capabilities as the replication and impact statements are formulated.**

Relocation of TATF would not be impossible, but it would be very difficult, time-consuming, and expensive. TATF could be relocated in a 2-3 year span at great costs to the Navy and at



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a loss of torpedo transducer testing capability during the time span of relocation. If lost, the DON would lose a one-of-a-kind, high volume, acoustic test facility that is capable of testing all of the DON torpedo types. If lost, depot level production testing of MK 46 and MK 48 torpedo transducers would not be possible, and torpedoes delivered to the Fleet that are not tested acoustically would reduce the reliability or performance of the torpedoes. If the torpedo transducers are not tested, units that do not meet weapons specifications for performance would end up in a Naval vessel's torpedo arsenal.

**9. Indicate how and when the facility/equipment was transported and or constructed at the site.**

The facility was constructed on site. The redwood tank was purchased from National Tank & Pipe Company, Clackamas, OR and assembled on site. Building construction started in 1989, and the facility was opened two years later. Software development for control of the test facility required 8 man years of effort. Various support electronics and hardware were purchased from a number of vendors, delivered to the site, and installed. The ADCAP Nose Array Test Set was developed and manufactured by the Hughes Aircraft Corporation and delivered in March 1994. Support structures for the ADCAP test set were designed and built at NUWC Division, Keyport and assembled on site.

**10. List the functional support areas (previously provided in Tab A) that this facility/equipment support. Refer to Appendix A for the list of Functional support areas.**

Functional Support provided by TATF is:

- 2. Weapons Systems
  - 2.4 Torpedoes

**11. Provide the historical utilization average for the past five fiscal years (1989-1993). Define the unit of measure used.**

Testing began at TATF in June 1992. Over 2,000 torpedo transducers have been tested at TATF since opening for business. Historical data shows over 1,000 tests per year (primarily MK 46 and MK 48) for the first two years of operation. The unit of measure is one complete torpedo transducer acoustic test as defined by the applicable weapons specification.



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**12. Provide the projected utilization data out to FY 1997.**

Torpedo transducer acoustic testing is projected to increase during the next few years as testing of MK 50 and MK 48 ADCAP will increase. Projected utilization to FY1997 is 1,200-1,300 tests per year.

**13. What is the approximate number of personnel used to operate the facility/equipment?**

Two people are required to operate the facility/equipment.

**14. What is the approximate number of personnel needed to maintain the equipment?**

Two people are required to maintain the equipment in conjunction with software and hardware maintenance contracts.

**15. Provide one 8 1/2 X 11 black and white photo of the facility/equipment.**



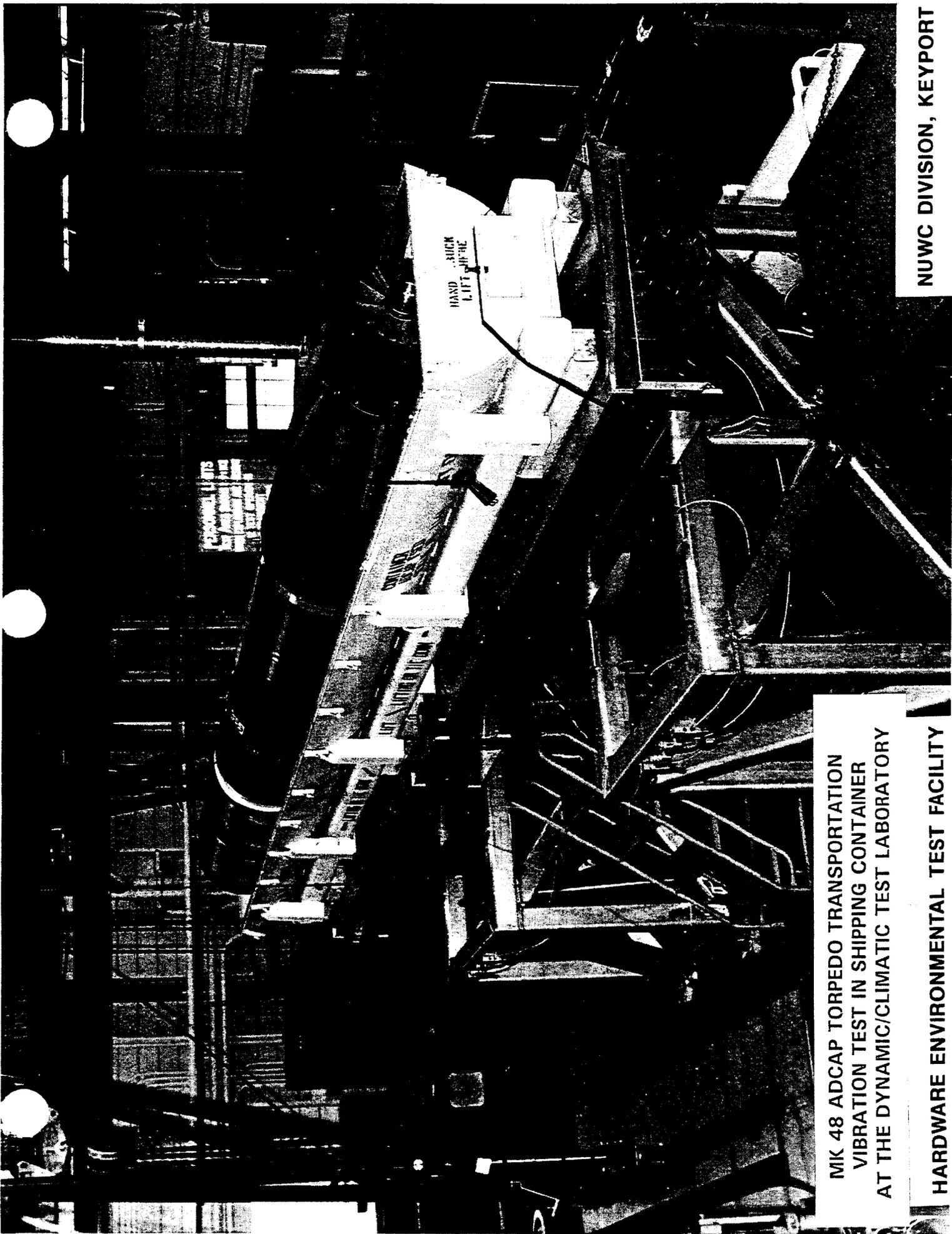
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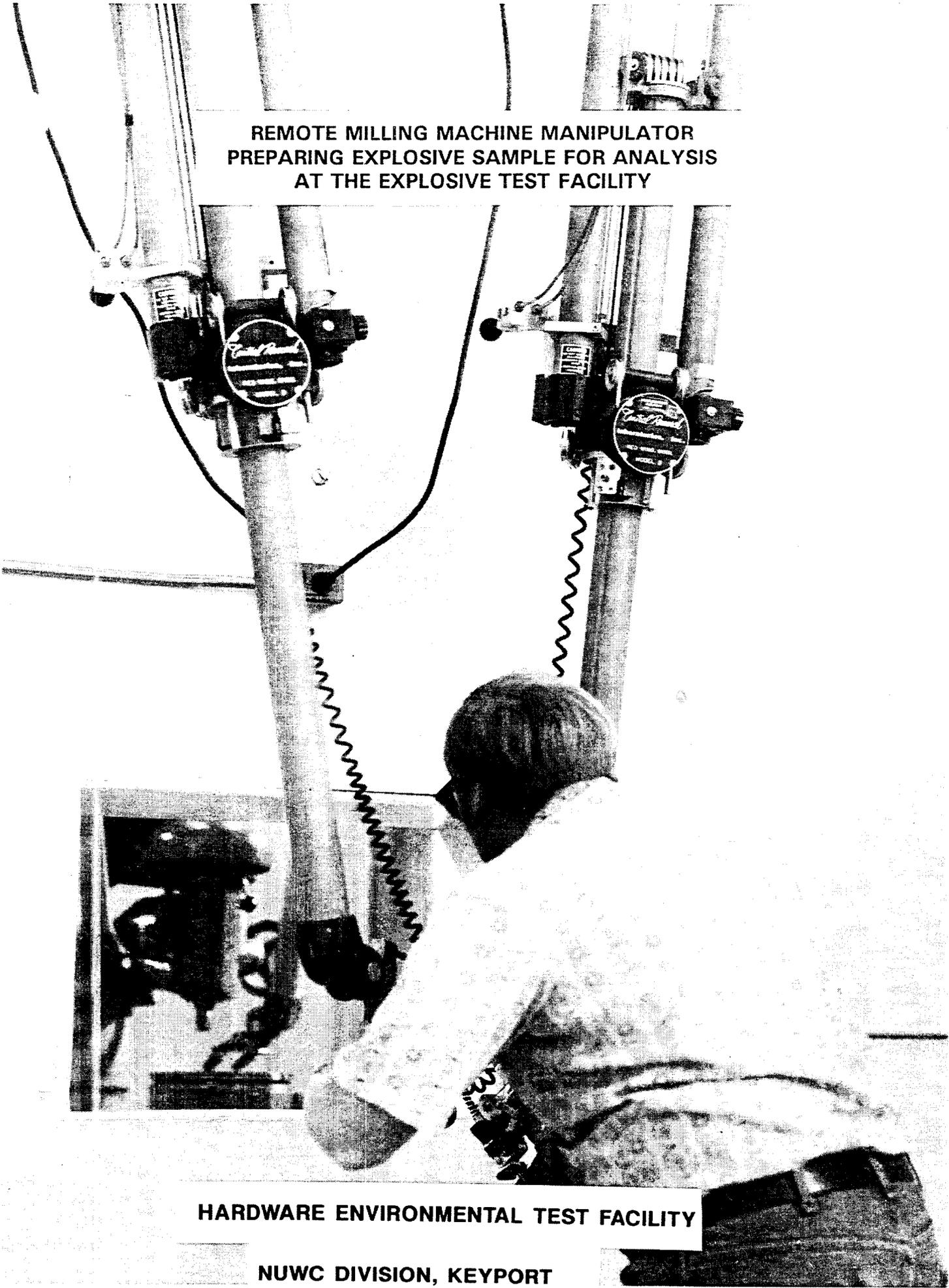
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**MK 48 ADCAP TORPEDO TRANSPORTATION  
VIBRATION TEST IN SHIPPING CONTAINER  
AT THE DYNAMIC/CLIMATIC TEST LABORATORY**

**HARDWARE ENVIRONMENTAL TEST FACILITY**

**NUWC DIVISION, KEYPORT**



**REMOTE MILLING MACHINE MANIPULATOR  
PREPARING EXPLOSIVE SAMPLE FOR ANALYSIS  
AT THE EXPLOSIVE TEST FACILITY**

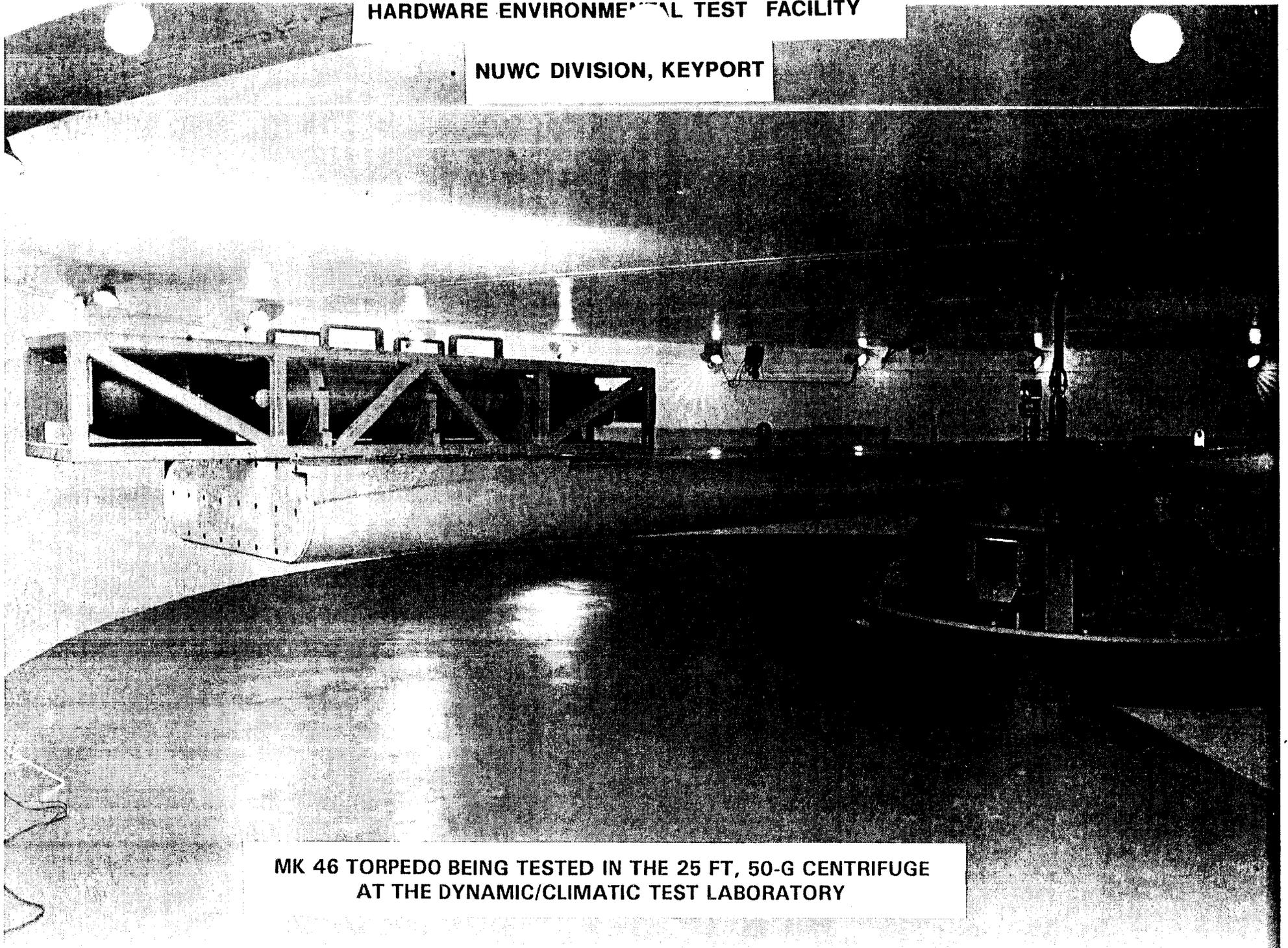
**HARDWARE ENVIRONMENTAL TEST FACILITY**

**NUWC DIVISION, KEYPORT**

**HARDWARE ENVIRONMENTAL TEST FACILITY**

**NUWC DIVISION, KEYPORT**

**MK 46 TORPEDO BEING TESTED IN THE 25 FT, 50-G CENTRIFUGE  
AT THE DYNAMIC/CLIMATIC TEST LABORATORY**



**SPECIAL FACILITIES AND EQUIPMENT  
FACILITIES/EQUIPMENT CAPABILITY FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Facility/Equipment Nomenclature or Title	Range Craft

**1. State the primary purpose(s) of the facility/equipment.**

Three large Yard Torpedo Test (YTT) craft are vital, integral parts of the range operations required for both U.S. and Canadian range tests. These unique, highly specialized vessels provide vital launch, fire control, and bottom recovery for the full spectrum of the Navy's undersea weapons, targets, and countermeasures. The YTT's were designed and built to Keyport's demanding technical requirements specifically for use on the Navy's Pacific Northwest Range System. Highly advanced technical and navigational features are employed in the torpedo recovery, fire control, launch, and ship-propulsion systems that make these craft uniquely suited to highly efficient range operation. The ability of the specially designed torpedo recovery systems installed on these craft to recover, intact and undamaged, torpedoes that have become embedded in the soft mud bottoms of the Northwest Range System is a unique and very valuable Navy asset. Small support craft satisfy other specialized range needs such as torpedo surface retrieval, acoustic measurement, and target deployment. Fundamental to the successful operation and maintenance of these unique range craft and related equipment are the highly skilled and trained technical personnel with a combined total of over 750 years of specialized experience.

The YTT fire control/launch systems were designed with virtually unlimited flexibility to accommodate not only the Navy's standard torpedoes, but also any Research and Development (R&D) underwater vehicle launch requirement. The heavyweight torpedo fire control/launch system includes two underwater MK 59 Torpedo Tubes (which emulate the firing capability of Fleet submarines), weapons handling equipment, and fire control equipment fully capable of launching the latest technology torpedoes. This system is capable of launching salvo shots necessary to investigate mutual interference in the acoustic systems of two torpedoes fired simultaneously. It provides realistic underwater launch conditions which could otherwise be achieved only through the employment of a Fleet submarine at commensurate cost. The lightweight torpedo fire control/launch system includes above-water MK 32 Torpedo Tubes. In addition to normal presetting and launching all MK 46 and MK 50 Torpedoes, this system is also capable of supporting specialized R&D requirements (such as launching pre-chilled "environmental" torpedoes), as well as other prototype units requiring



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surface launch. Other specialized YTT systems support the unique requirements of R&D underwater vehicles and vehicles with towed arrays, including a side-rail swimout launcher and a stern target launcher.

The YTT's are outfitted with permanent recovery support equipment required to operate Keyport's Remote Operated Vehicles (ROV's). Each YTT has a control center and specialized deployment system that can accommodate any of the three main Keyport ROV's -- SORD IV, CURV II, and TROV-N. The ROV's are capable of recovering torpedoes without damage from the soft bottom of Northwest range sites, even when the torpedo is buried up to 30 feet deep in the mud. This Navy-unique ability is extremely desirable for weapon research and development. The capability to reliably recover production test or R&D torpedoes undamaged is only available on the Northwest Range System with Keyport recovery systems. Not only is the hardware saved for future tests, but equally important, the data contained in the onboard recorder is recovered to determine the cause of the failure that sent the torpedo to the range bottom. Further, the costs of torpedo refurbishment are minimized by eliminating damage during recovery. Keyport's ROV's have reliably recovered more than \$300M worth of torpedoes and one-of-a-kind, R&D prototype vehicles in the last five years--and over \$1.5 billion worth in the last 25 years. Keyport's ROV's are used for many other applications, including range maintenance and deep submergence/ salvage operations. Some of the diverse recovery operations include installation of special sensors on the ocean bottom, running specially configured underwater fiber-optic cable systems, assisting in bottom-mounted instrument repair, investigating aircraft crashes, and locating and recovering items lost at sea.

The YTT's also provide general range maintenance (e.g., setting and retrieving buoys and their anchors, laying underwater cables, placing tracking arrays on the sea floor, etc.), and have a full complement of deck hardware to accomplish this. Each YTT has a crane capable of 8.5 tons, a heavy-lift capstan capable of 10 tons, and a large working deck that is used for a variety of special applications. Ship maneuverability is unlimited, with both a bow thruster and twin trainable stern thrusters to permit turning 360 degrees in place or holding any desired firing heading while maintaining position in windy weather. The craft have state-of-the-art navigation systems to provide range and bearing data automatically from their current position to any desired point on the range.

The modern, state-of-the-art YTT's were outfitted specifically for use on the Northwest Range System and are an essential part of the range. The recovery, launch, fire control, and maneuvering capabilities of these craft are one of the key reasons the Northwest Range System is a unique asset for torpedo proofing and undersea RDT&E/DT&E vehicle testing.

The Naval Sea Systems Command has identified the Northwest Range System facility as having unique and essential capabilities in recent studies, and it is in direct support of the policy imperative to maintain organic capability to provide fleet maintenance.



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**2. Indicate whether the facility/equipment is portable, moveable or fixed as defined by paragraph 6, 12 of this data call.**

The three YTT Range Craft are an essential and integral part of the Northwest Range System. These craft are the primary platforms for conducting new torpedo procurement acceptance tests, as well as conducting underwater weapon and vehicle developmental tests. The launch systems, recovery systems, and other important onboard systems were developed specifically to support underwater weapon test requirements. These expensive and complex craft systems are integrated and used with the shore-based range control systems as the mobile part of the Northwest Range System. Although the craft are self-propelled and could be moved, once outside the Northwest Range System, they would have a reduced capability since this is the Navy's only range system with bottom depths "above crush pressure," thereby allowing intact recovery of tested hardware. Without these craft and special onboard systems, NUWC Division, Keyport would be unable to launch torpedoes, support special projects, or conduct range maintenance.

**3. Provide the replacement value of the facility/equipment. Report the facility/equipment cost separate from any building and utilities that may be integral to the facility/equipment.**

The three YTT's totally outfitted including recovery equipment represent an \$80.5M investment. Each craft's replacement value is \$15M for a total craft replacement costs of \$45M. The fire control and permanent onboard recovery support equipment replacement cost represent an additional \$25M. The underwater recovery vehicles are another \$10.5M.

**4. Provide the gross weight and cube of the facility/equipment.**

Each YTT, identical in design, is 186' 6" in overall length, has a 40' beam, and has a full-load displacement of 1,200 tons.

**5. Indicate any "special" utility support required by this facility/equipment other than normal electrical power.**

n/a

**6. Indicate any special budget requirements for the facility/equipment (i.e., special foundations, non-ferrous materials, shielding, hardening, etc.).**



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Following delivery, each YTT was outfitted at Keyport to meet special range requirements. Recovery equipment and fire control equipment were installed. Total cost of equipment and installation was \$25M.

**7. State any environmental control requirements for the facility/equipment (i.e., temperature, humidity, air scrubbing).**

The craft have installed waste Collecting, Holding, and Transfer (CHT) tanks and oily bilge water separators which are fully compliant with U.S. and Canadian environmental requirements.

**8. Indicate if this facility/equipment would be extremely difficult or impossible to replicate or relocate at another site and the impact to the Department of the Navy if this facility/equipment were lost. Consider existing Government-wide and commercial capabilities as the replication and impact statements are formulated.**

The YTT craft could be relocated, but they are an essential and integral part of the Northwest Range System. Since they serve as the launch platforms for torpedoes for both the U.S. and Canada, they are required to remain available as long as the formal International Agreement to share the Nanoose Range remains in force. Recovery System capabilities, such as load capacity, depth capability, weapon interfaces, and special tooling, have been developed specifically for use on the Northwest Ranges. Similarly, Fire Control and Launch subsystems have been designed and built to provide versatile capabilities. Various support systems, such as communications, tracking, and launch attitude measurement, have direct interfaces with shore-site facilities that would minimize their usefulness elsewhere. No other resource exists that could take the place of the YTT craft in Government or private industry.

These craft are the primary platforms for conducting underwater weapon and vehicle developmental tests for both the U.S. Navy and for Canada. The launch systems, recovery systems, and other important onboard systems were developed specifically to support underwater weapon test requirements. These high-value, complex craft systems are integrated with, and used with, the shore-based range control systems as the mobile part of the Northwest Ranges.

The equipment found on YTT craft along with the personnel expertise, is equaled no where else in the Government or in private industry. The Fire Control Systems, Recovery Systems, and other shipboard systems are highly specialized for Naval undersea ordnance work. Even the ROV frame configuration is substantially different from commercial vehicle frames. Our ROV's are required to lift 4,000 pound torpedoes in sea state 3. Because of routine, day-in and day-out operations, Keyport Recovery Systems have been developed to allow for operation with at least one or two fewer crew members than would be found in private



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industry. These systems could not be replicated in industry without many false starts and trial and error attempts. Keyport's Fire Control and Launch Systems provide a unique, dual-torpedo, launching system that controls, monitors, and records the signals passed across the vehicle electronic interface. No other systems like this exist in the world.

**9. Indicate how and when the facility/equipment was transported and or constructed at the site.**

The three YTT's were delivered to Keyport in 1990 and 1991.

**10. List the functional support areas (previously provided in Tab A) that this facility/equipment support. Refer to Appendix A for the list of Functional support areas.**

This equipment is integral to the YTT range craft, and the Northwest range. Programs supported include:

- 2. Weapons Systems
  - 2.4 Torpedoes
  - 2.5 Mines
- 8. Defense Systems
  - 8.2 Countermeasures (CM) (Also Submarine Torpedo Defense)
- 10. General Mission Support
  - 10.4 Diving, Salvage, and Ocean Engineering
  - 10.7 Major Range Development and Operation

**11. Provide the historical utilization average for the past five fiscal years (1989-1993). Define the unit of measure used.**

Although the first YTT was placed in service in 1991, utilization is similar to the previous Keyport range craft. The annual average underway hours per craft was 1,600 hours per year based upon the YTT log books. Considering that additional time was necessarily consumed in maintenance and holidays, this equates to an average of 100 percent utilization for the past five fiscal years.

**12. Provide the projected utilization data out to FY 1997.**

Three YTT's are 100 percent utilized through FY 95. In FY 96, due to a projected decrease in range workload, one YTT will be kept in a "ready operate" status 50 percent of the time to support the two active YTT's.

FY94      100      percent utilization (three craft average)



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FY95	100	percent utilization (three craft average)
FY96	83	percent utilization (three craft average)
FY97	83	percent utilization (three craft average)

**13. What is the approximate number of personnel used to operate the facility/equipment?**

There are 25 U.S. Navy military personnel per craft for a total of 75. During range operations, two civilian technicians for fire control systems or two civilian technicians for recovery systems are required, depending upon the range requirements.

**14. What is the approximate number of personnel needed to maintain the equipment?**

The U.S. Navy military operating crew also performs preventive maintenance and routine upkeep. In addition, there are five civilian maintenance personnel for each YTT to provide depot level maintenance. Maintenance of fire control systems and recovery systems are provided by the respective operators.

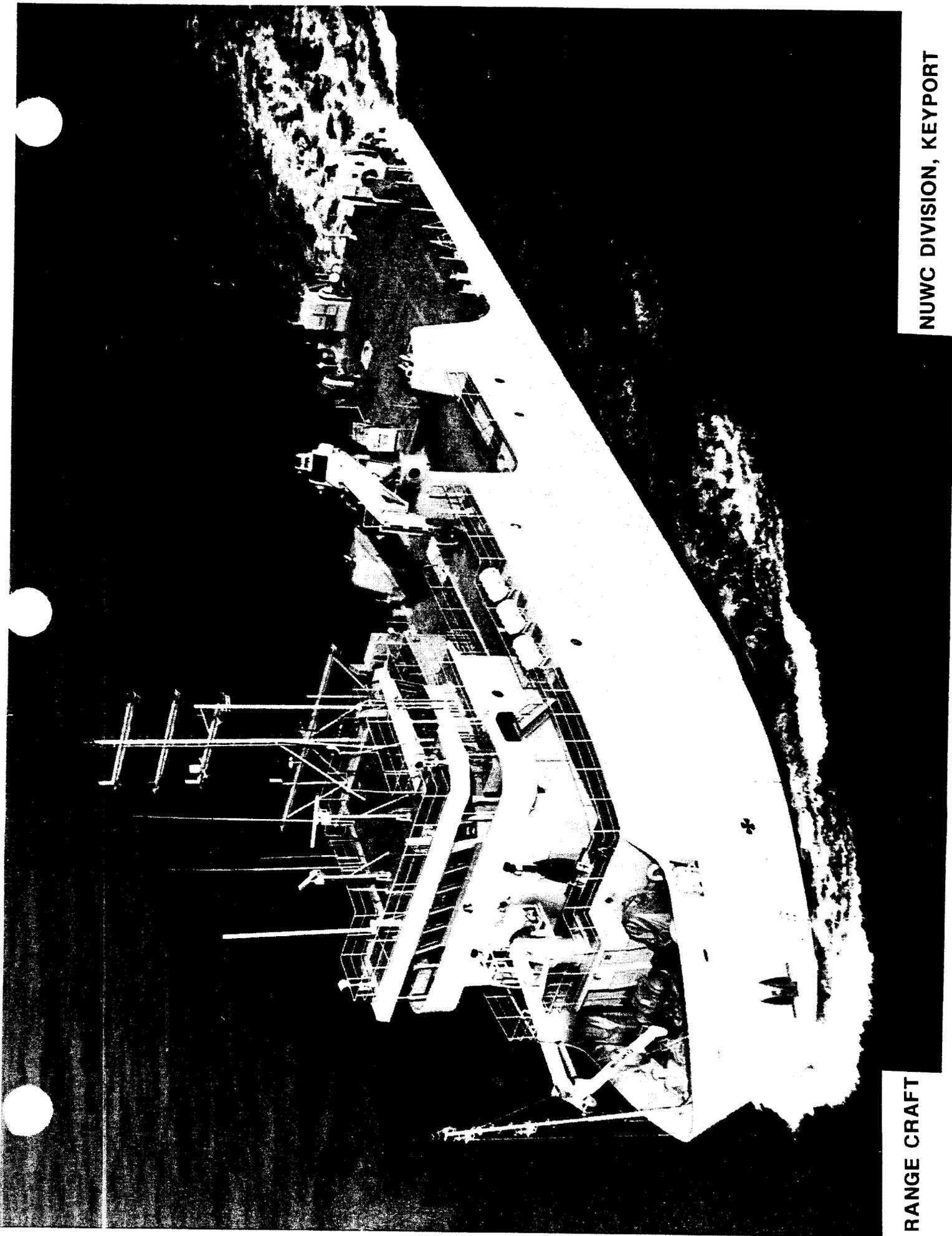
**15. Provide one 8 1/2 X 11 black and white photo of the facility/equipment.**

See Attached.



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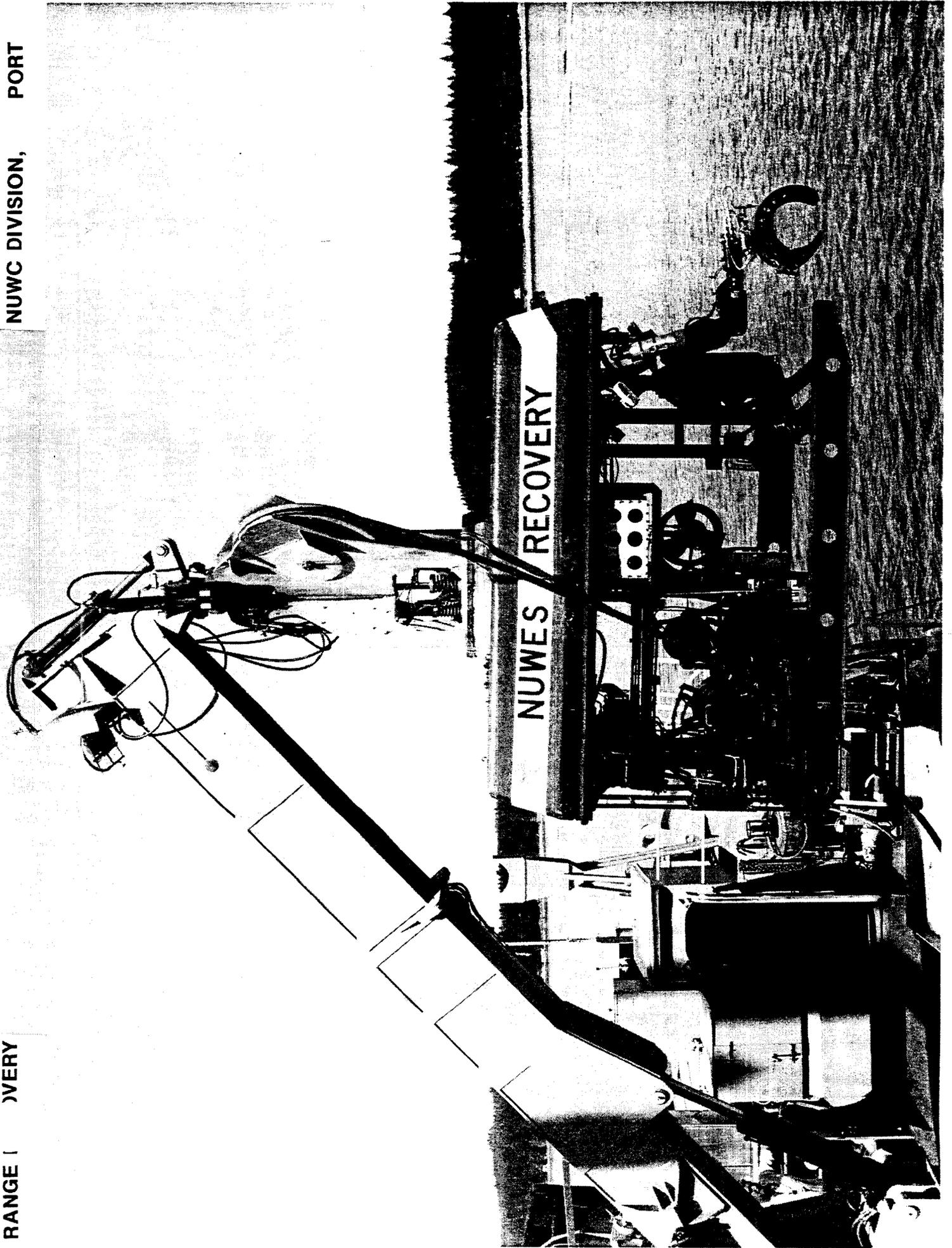


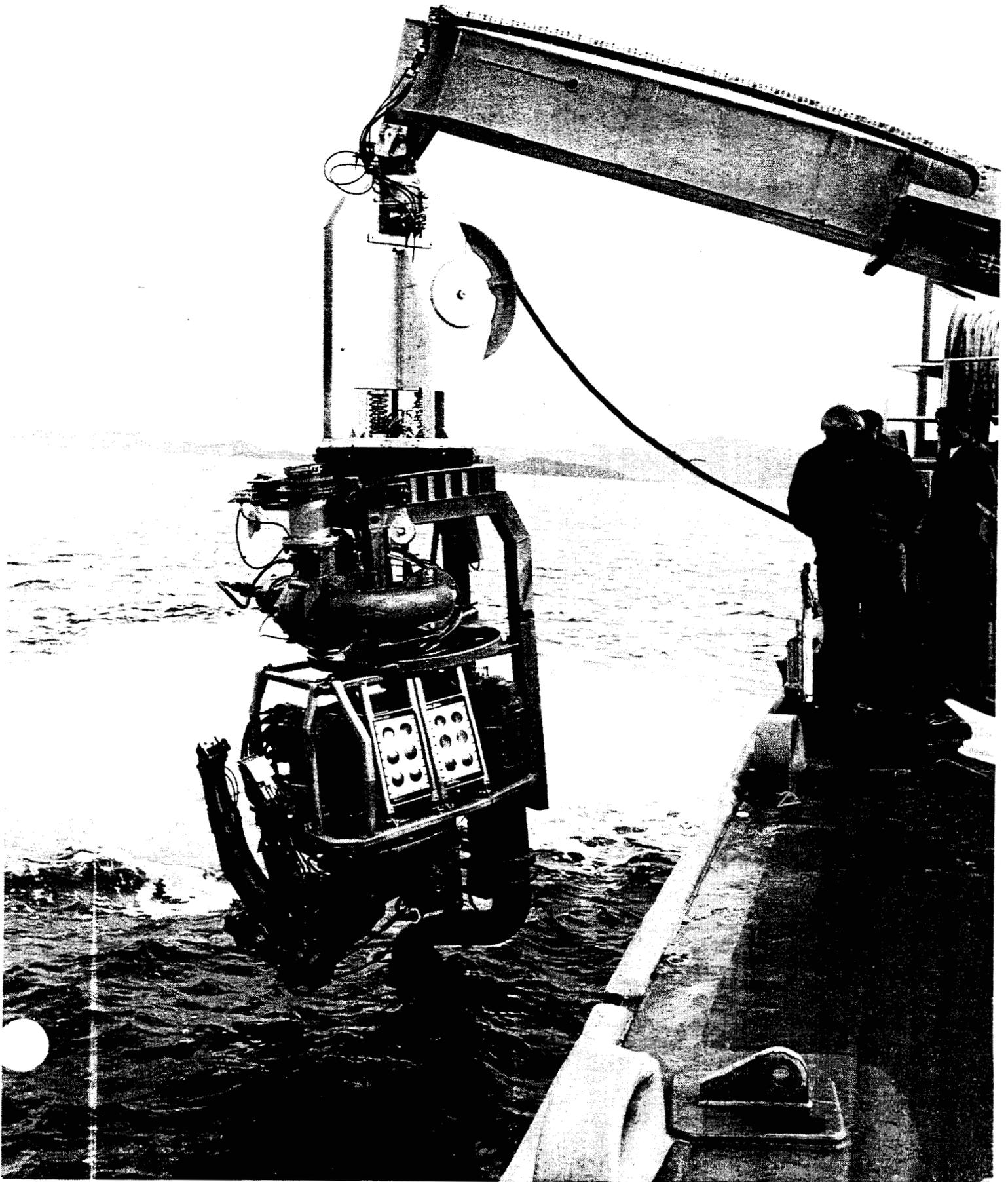
RANGE CRAFT

NUWC DIVISION, KEYPORT

RANGE I RECOVERY

NUWC DIVISION, PORT





SPECIAL FACILITIES AND EQUIPMENT  
FACILITIES/EQUIPMENT CAPABILITY FORM

Technical Center Site	NUWC Division, Keyport Keyport, WA
Facility/Equipment Nomenclature or Title	Target MK 30 and Range Tracking Pinger Intermediate Maintenance Activities (IMAs)

**1. State the primary purpose(s) of the facility/equipment.**

The primary purpose of the Target MK 30 IMA's and the Pinger IMA's are to perform target and pinger "turnaround" processing in support of Department of the Navy Fleet undersea warfare exercises at the PACMISRANFAC and SCORE/SCIUR ranges. Target and pinger processes are performed in accordance with applicable technical manuals and procedures. Support test equipment measure and compare the acquired data against acceptable test parameters/limits specified in the applicable technical documents. Mobile target services are required for Fleet USW readiness/training exercises conducted on the underwater ranges. Pingers (underwater range tracking systems) are required in underwater weapons, targets, and submarines in order to track these units on the Fleet underwater ranges. Fleet USW testing and training are essential for operational readiness. Training facilities are needed in close proximity to Fleet home-porting areas.

NUWC Division, Keyport operates and maintains two target facilities that are located at Barking Sands, Kauai, Hawaii and at North Island, San Diego, California, and two pinger facilities that are located at Lualualei, Oahu, Hawaii and at North Island. The Navy's only pinger repair depot is located with the pinger IMA at Lualualei, Hawaii. These facilities are in close proximity to Fleet facilities at Pearl Harbor, Hawaii, and at San Diego, California, and ideally situated to support Fleet USW customers through FY99 and beyond. They are supported by highly skilled technical personnel with a combined total of over 670 years of specialized experience in target and pinger turnaround processing.

In-house support engineering capabilities, as well as support infrastructure available among the Hawaii, San Diego, and Keyport facilities, make it possible to provide timely, cost-effective support to meet customer requirements.



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2. Indicate whether the facility/equipment is portable, moveable or fixed as defined by paragraph 6, 12 of this data call.

The buildings comprising the facilities are of both the fixed and relocatable types. The fixed buildings are made of concrete; the other structures are pre-engineered, relocatable buildings with poured concrete slab floors. Moving costs are anticipated to be in the order of \$1M per site, while replacement MILCON buildings to house the function at other locations would entail a construction cost of approximately \$8M per site.

However, while the function is relocatable, replication of the facilities is difficult. At present the facilities are located with access to landing strips (helo pads for helicopter deployment/retrieval of the target), access to pier berthing (surface ships for deployment/retrieval), and easy transportation from shop to any other points of pinger installation (military air and Navy bases). Given these features, the relocation of the function is possible, but difficult.

3. Provide the replacement value of the facility/equipment. Report the facility/equipment cost separate from any building and utilities that may be integral to the facility/equipment.

The cost of replacing the buildings at new sites is estimated at \$8M per site. Replacement costs of the equipment is estimated at \$25M per site if all new support equipment is procured. However, the bulk of the equipment could be relocated from the old location.

4. Provide the gross weight and cube of the facility/equipment.

The facilities are estimated to be 240,000 cubic feet (180,000 cubic feet - target shop, 60,000 cubic feet - pinger shop). Weight of the structures/equipment is estimated at 10 million pounds.

5. Indicate any "special" utility support required by this facility/equipment other than normal electrical power.

450V, 3 phase, 400 amp electrical service is required for high current battery charging requirements. No special uninterruptable power is available nor required. However, fire alarm/intrusion systems are required due to classified equipment stored within these facilities. In addition, a large-diameter (2-inch) water supply pipe is required.



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6. Indicate any special budget requirements for the facility/equipment (i.e., special foundations, non-ferrous materials, shielding, hardening, etc.).

Special budgeting requirements for each facility are the footing - floor slabs for forklift loads/ special heavy water tanks; special venting and fire extinguisher systems for battery charging and electronic equipment; washdown areas with holding tank for hazardous material rinse water; venting for battery charging gases; physical security construction and outside lighting; large (22-ft) rollup door; overhead crane (4-ton capacity); and provisions for clean, quiet computer lines.

7. State any environmental control requirements for the facility/equipment (i.e., temperature, humidity, air scrubbing).

These facilities must be air-conditioned for both humidity and temperature control for protection of the electronic equipment. Venting provisions are required for the gases that battery charging/discharging generates; some holding tanks for rinse water of hazardous material-contaminated items are required.

8. Indicate if this facility/equipment would be extremely difficult or impossible to replicate or relocate at another site and the impact to the Department of the Navy if this facility/equipment were lost. Consider existing Government-wide and commercial capabilities as the replication and impact statements are formulated.

The relocation of the equipment is possible, but it would be costly and difficult to provide suitable facilities that would not only provide sufficient spaces but also be located in the close proximity to the range facilities to which these IMAs support. The limited availability and transportation/logistics cost of providing target and pinger support elsewhere (other than from present locations) would be prohibitive.

9. Indicate how and when the facility/equipment was transported and or constructed at the site.

The facilities are a combination of pre-engineered and constructed on-site buildings. The concrete buildings were built on site, while the pre-engineered buildings were manufactured elsewhere and assembled on site. In all cases the concrete flooring was poured on site. The facilities were built and/or refurbished for the present use from 1950 through 1994.

10. List the functional support areas (previously provided in Tab A) that this facility/equipment support. Refer to Appendix A for the list of Functional support areas.



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The target and pinger IMAs support the following functional support areas:

2. WEAPON SYSTEMS

- 2.4 Torpedoes
- 2.5 Mines
- 2.9 Fire Control

5. SENSORS & SURVEILLANCE SYSTEMS

- 5.1 Sonar Systems

10. GENERAL MISSION SUPPORT

- 10.1 Personnel and Training
  - 10.1.1 Submarine-Related Training Systems
  - 10.1.4 Weapons-Related Training Systems

11. Provide the historical utilization average for the past five fiscal years (1989-1993). Define the unit of measure used.

Some 4,043 MK 30 Target turnarounds/preparations and 12,197 pinger turnarounds were performed by the NUWC Division, Keyport's target and pinger IMA's in Hawaii and San Diego during 1989-1993. An annual average number supported were 809 MK 30 Target turnarounds and 2,439 pinger turnarounds.

12. Provide the projected utilization data out to FY 1997.

MK 30 Target turnarounds and pinger turnarounds for the Hawaii and San Diego IMAs are projected to remain relatively level for the next few years. Projected utilization to FY 1997 are 738 MK 30 Target turnarounds and 1,960 pinger turnarounds per year.

13. What is the approximate number of personnel used to operate the facility/equipment?

Thirty-three (33) people are required to operate the pinger and target IMAs at Hawaii and San Diego as outlined in the following table:

	Hawaii <u>Operations</u>	San Diego <u>Operations</u>	Total <u>Operations</u>
Target IMA's	10	10	20
Pinger IMA's	<u>7</u>	<u>6</u>	<u>13</u>
Total	17	16	33

14. What is the approximate number of personnel needed to maintain the equipment?



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Twenty-two (22) people are required to maintain the pinger and target IMAs in Hawaii and San Diego as outlined in the following table:

	Hawaii Maintenance	San Diego Maintenance	Total Maintenance
Target IMA	6	6	
Pinger IMAs	5	5	
Total	11	11	22

15. Provide one 8 1/2 X 11 black and white photo of the facility/equipment.

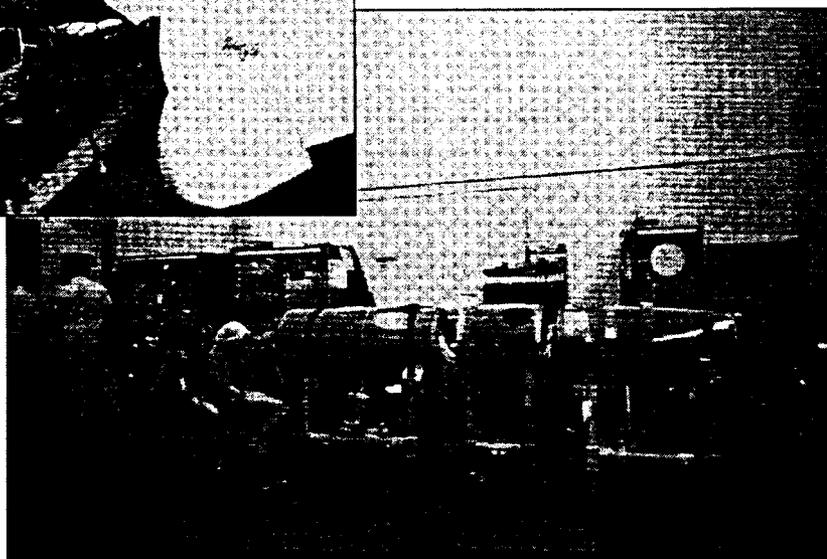
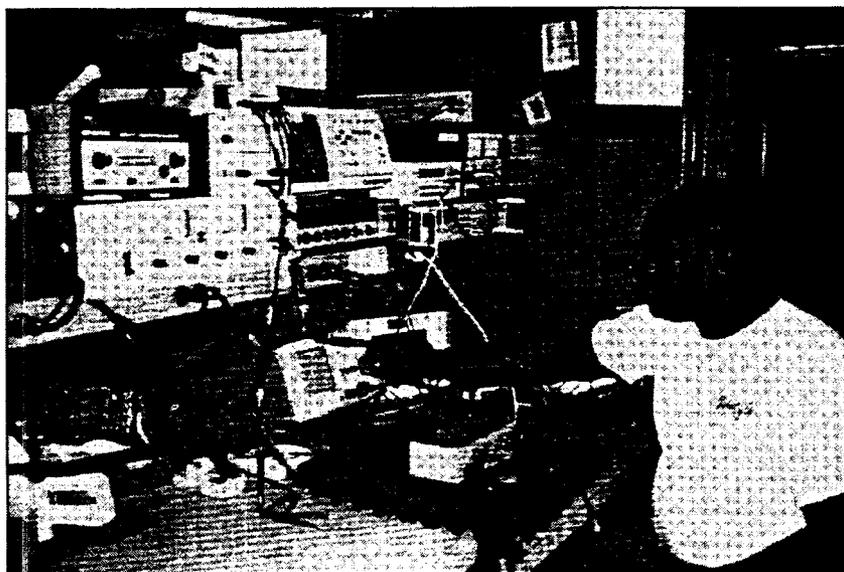
One composite photo for the Hawaii and San Diego Target IMA's and Pinger IMA's is attached.



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# TARGET AND PINGER FACILITIES



**FLEET OPERATIONAL SUPPORT DEPARTMENT**

**NUWC DIVISION, KEYPORT**

**SPECIAL FACILITIES AND EQUIPMENT  
FACILITIES/EQUIPMENT CAPABILITY FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Facility/Equipment Nomenclature or Title	Shipboard Electronic Systems Evaluation Facilities (SESEF)

**1. State the primary purpose(s) of the facility/equipment.**

The primary purpose of the Shipboard Electronic Systems Evaluation Facility (SESEF) is to improve Fleet readiness by providing Fleet units with an operational and material evaluation of all shipboard electromagnetic radiating and receiving systems. NUWC Division, Keyport operates and maintains three SESEF sites located in Southern California at Point Loma, San Diego; in MIDPAC at Barbers Point, Hawaii; and in PACNORWEST at Ediz Hook, Washington. Each SESEF site was strategically located next to a major Fleet concentration in order to maximize Fleet utilization with minimal or no steaming requirements. Site upgrades are provided to match Fleet requirements, assuring Fleet compatibility into the future. Value added benefits are evident by a continuing growth in Fleet utilization from 400 ship tests in FY89 to over 1,600 ship tests in FY93.

Each SESEF site is capable of supporting submarines, surface ships, and aircraft, both dockside and underway, and land based facilities, as well as "roof-top trainers." Testing is inter-service related, providing support to Navy, Air Force, and Marine Corps units. Feedback is in real time for most tests, permitting equipment repair (when needed) and verification prior to departure from the range. Testing is conducted in accordance with applicable equipment specifications (material readiness) and Fleet instructions (operational readiness). Systems that can be tested and evaluated by SESEF include all communication equipment, Tactical Air Navigation (TACAN) systems, Identification Friend or Foe (IFF), radar and communication antennas (antenna radiation patterns), Electronic Surveillance Measurement (ESM), Electronic Countermeasure (ECM), Radio Direction Finder (RDF), and Tactical Data System. SESEF sites are operated and maintained by highly skilled technical personnel with a combined total of over 80 years of specialized experience.

SESEF is in tune with the Fleet requirements and is used extensively to determine the operability and material readiness under at-sea conditions of combat systems electromagnetic radiating and receiving equipment; support INSURV testing during at-sea Acceptance Trials, Final Contract Trials, and Underway Material Inspections; identify major deficiencies to the ship's combat systems configuration; and to validate engineering design.



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**2. Indicate whether the facility/equipment is portable, moveable or fixed as defined by paragraph 6, 12 of this data call.**

These facilities are not portable, but can be moved. The moving costs are anticipated to be in the order of one million dollars to relocate into relocatable vans for temporary operation. Permanent relocation would require MILCON buildings at estimates of \$1.5 million per site.

However, while physically moveable, the testing function is "locked-in" to the present geographical locations. These locations (as further reiterated in question # 8 on the following page) were chosen to be free of electromagnetic transition interference and having the ability of testing the naval vessel "on the fly" during their normal transit routes through the area.

**3. Provide the replacement value of the facility/equipment. Report the facility/equipment cost separate from any building and utilities that may be integral to the facility/equipment.**

The replacement value of NUWC Division, Keyport's SESEF facilities and equipment (Ediz Hook, Point Loma, Barbers Point) is estimated to be \$19.5 million.

**4. Provide the gross weight and cube of the facility/equipment.**

The volume of the facilities is 48,000 cubic feet (40 x 40 x 10 per site.) The weight (concrete pads + equipment + building + antenna towers) is approximately three million pounds (1 million pounds per site.)

**5. Indicate any "special" utility support required by this facility/equipment other than normal electrical power.**

These facilities are fed by 208V, 3 phase, 150 amps electrical service. The facilities have a special ground grid buried around the perimeter of the vans housing the equipment. Ground rods are buried and hooked to the antenna tower. Remote fire alarm/intrusion systems are required due to classified equipment stored within these facilities.

**6. Indicate any special budget requirements for the facility/equipment (i.e., special foundations, non-ferrous materials, shielding, hardening, etc.).**

Special budgeting requirements for each facility are the pier/footing foundations to support the two 40-foot vans housing the equipment, a 100-foot antenna tower, a 23.5 foot square, 3.5 foot thick concrete pad foundation for the antenna tower, four 5 x 3 x 5 foot concrete antenna foundations, a TEMPEST survey, a electromagnetic field survey, and security fencing and lighting.



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**7. State any environmental control requirements for the facility/equipment (i.e., temperature, humidity, air scrubbing).**

These facilities must be air-conditioned for both humidity and temperature control for protection of the electronic equipment. Positive pressure, dry air is required for proper transmission of the high frequency electromagnetic signals through the waveguides.

**8. Indicate if this facility/equipment would be extremely difficult or impossible to replicate or relocate at another site and the impact to the Department of the Navy if this facility/equipment were lost. Consider existing Government-wide and commercial capabilities as the replication and impact statements are formulated.**

The replication/relocation of the equipment is possible; however, the location of each site would be highly difficult to replicate. These sites were specifically chosen for two parameters: the ability to electronically "see" the naval vessels under test while they transit from point to point, and the location of the site as to not interfere with (or be interfered by) existing radio-frequency (RF) signals in the area. The subcriterion in the electronic "seeing" of the vessel was the testing of the vessel in the least disruptive manner to their normal routine, i.e., testing/monitoring the vessel as it normally transverses the area, leaving or entering the port.

Without these sites, routine operational testing of shipboard electronic systems to ensure readiness/functionality would be available only on a haphazard basis and at considerably more cost.

**9. Indicate how and when the facility/equipment was transported and or constructed at the site.**

SESEF Hawaii. The facility was constructed on site at Barbers Point. A 100 foot antenna tower was purchased from MICROFLECT Company, Salem, Oregon, and assembled on site. Building construction started in 1991, and the facility was opened in July 1992. Support electronics and hardware were provided by the NAVSEA Field Technical Design Agent and also purchased from various vendors, delivered to the site, and installed.

SESEF San Diego. The facility and 50 foot antenna tower was constructed on site at Point Loma. Building construction started in 1985, and the facility was opened in 1987. Support electronics and hardware were provided by the NAVSEA Field Technical Design Agent and also purchased from various vendors, delivered to the site, and installed.



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SESEF Ediz Hook. The facility was constructed on site at Ediz Hook and opened in 1989. Support electronics and hardware were provided by the NAVSEA Field Technical Design Agent and also purchased from various vendors, delivered to the site, and installed.

**10. List the functional support areas (previously provided in Tab A) that this facility/equipment support. Refer to Appendix A for the list of Functional support areas.**

Functional Support provided by SESEF:

- 7. Command, Control, Communications, and Intelligence (C3I)
  - 7.1 Submarine
- 8. Defense Systems
  - 8.2 Countermeasures
- 10. General Mission Support
  - 10.1 Personnel and Training
    - 10.1.1 Submarine-Related Training Systems

**11. Provide the historical utilization average for the past five fiscal years (1989-1993). Define the unit of measure used.**

There have been approximately 12,000 ship/aircraft system tests by NUWC Division, Keyport SESEF's over the FY 1989-1993 period for an average of 2,400 per year. The unit of measure is systems tested.

**12. Provide the projected utilization data out to FY 1997.**

SESEF testing is projected to remain relatively flat for the next few years. Projected utilization to FY 1997 is 2,200-2,300 system tests per year.

**13. What is the approximate number of personnel used to operate the facility/equipment?**

A total of eight people are required to operate the facilities/equipment at all three sites (an average of 2.7 per site).

**14. What is the approximate number of personnel needed to maintain the equipment?**

Three workyears of effort are required to maintain the equipment at all three sites (an average of one workyear per site).

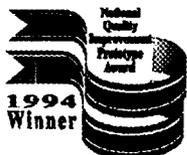


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15. Provide one 8 1/2 X 11 black and white photo of the facility/equipment.

See attached.



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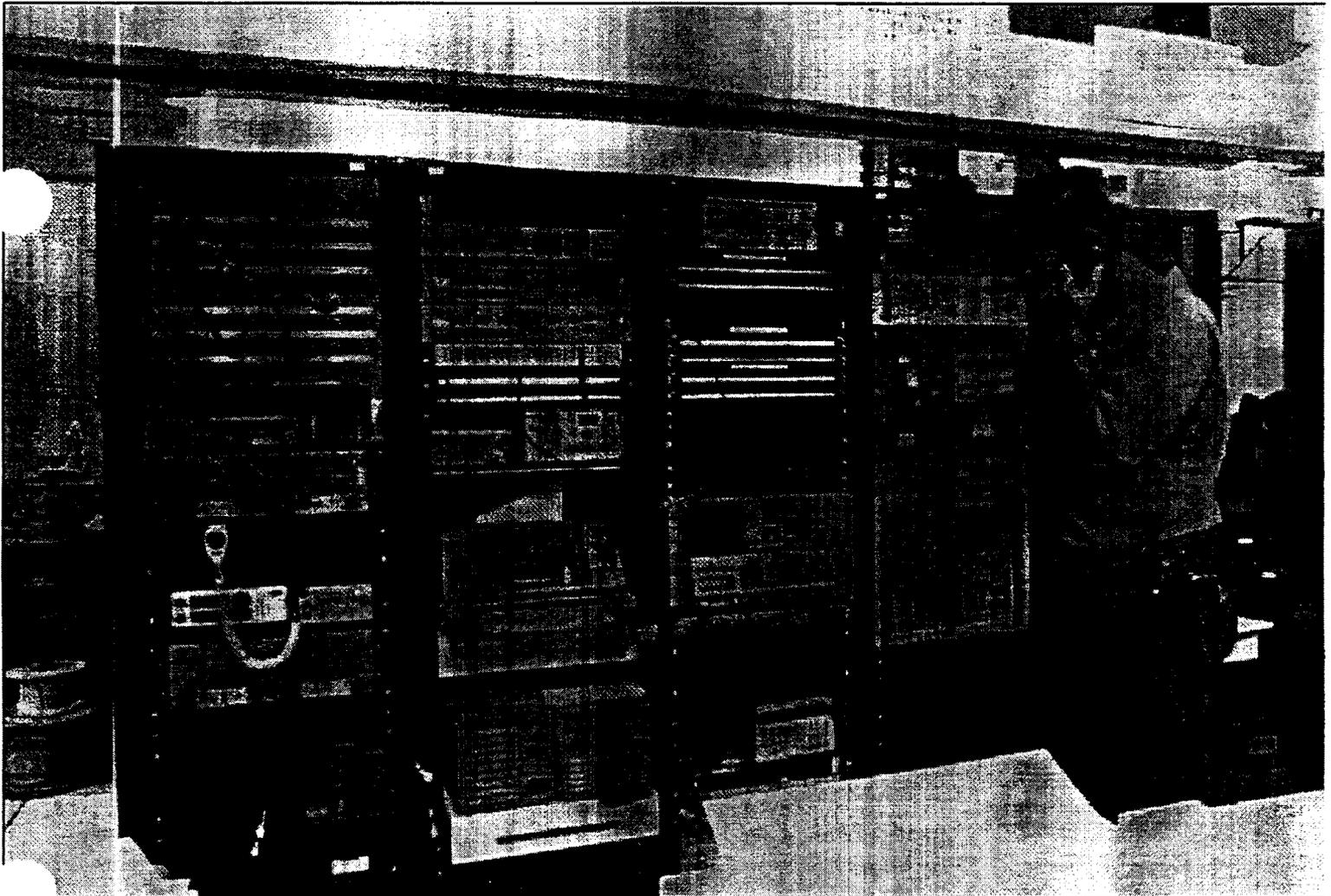
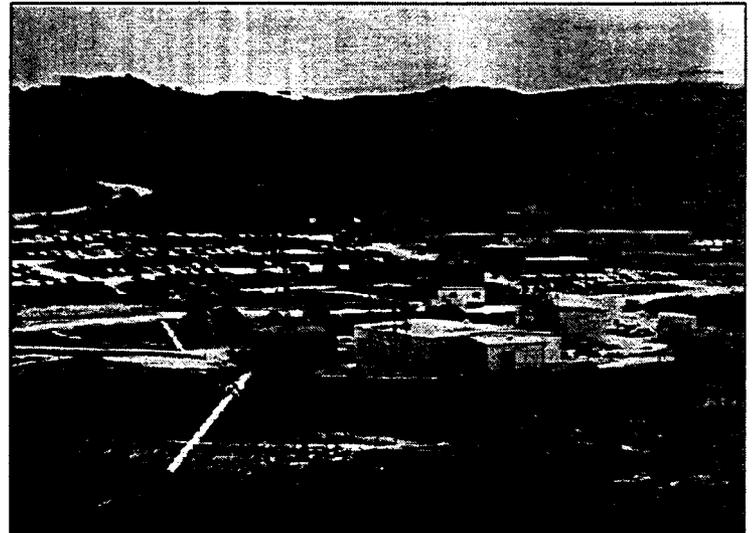
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# SESEF FACILITIES/OPERATIONS

HAWAII SITE



SAN DIEGO SITE



EDIZ HOOK SITE - (INTERIOR)

SHIPBOARD ELECTRONIC SYSTEM EVALUATION FACILITY, NUWC DIVISION, KEYPORT

**SPECIAL FACILITIES AND EQUIPMENT  
FACILITIES/EQUIPMENT CAPABILITY FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Facility/Equipment Nomenclature or Title	Combat Systems Facility

**1. State the primary purpose(s) of the facility/equipment.**

The Combat Systems Facility at NUWC Division, Keyport is a one of a kind facility focused on providing cost-effective solutions to maintain operational Fleet combat systems in a state of high readiness through the application of in-service support. This facility is dedicated to operational systems with the primary purposes to (1) extend service life of systems, (2) ensure continued supportability of system components, (3) restore equipment to ensure continued readiness, (4) provide obsolete equipment replacement, and (5) ensure the technical data meets Fleet needs to enable sustainment at sea. This is accomplished through a synergistic linkage of depot, engineering, and industrial processes.

This facility is comprised of a newly constructed two story MILCON (Building 1050) of 74,000 square feet designed and built specifically to meet the needs of operational Combat Systems. By allowing this MILCON Project to proceed in a very restrictive MILCON environment, the Navy and Congress confirmed the importance of this facility. Within this building are the three primary components of this facility. The first component is the integrated labs, comprised of Fast Attack Submarine (SSN) Combat Systems, Fleet Ballistic Missile Submarine (SSBN) Combat Systems, Aircraft Carrier, and ancillary equipments. These labs are the same equipment installed on the various Naval platforms with limited modifications to allow for shorebased utilization. This installed Fleet hardware is an embedded component of the facility, providing the means to test and evaluate the various products of the facility.

The second component of the facility are specialized systems comprised of high technology electronic hardware and commercial software applications and are categorized into automated and manual test systems, electronic data systems, and electronic circuit technology systems. Used in conjunction with the Fleet hardware, these systems provide the technological means to create the products of the facility.

The third and last component of the facility are the processes which fully maximize the capability of the two other components and are comprised of depot, engineering, and



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industrial. The depot processes provide for the restoration of Fleet hardware utilizing the specialized systems for hardware specifications and drawings and for specialized diagnosis and test capability. The system laboratories are used as the final test before shipment to the Fleet to ensure a fully operational and stable system. Engineering processes provide the solutions to extend the service life of Fleet systems, ensure continued supportability of system components, provide for obsolete equipment replacement, and to ensure that the Fleet operation and maintenance manuals meet Fleet needs to enable sustainment at sea. These processes utilize the specialized systems and utilize the facilities combat systems lab for evaluation of these solutions. The final process, industrial, overlays all other processes in this facility by providing those industrial processes, such as fabrication, painting, electrical assembly, and parts warehouse functions, as a common resource not only to the Combat Systems Facility but elsewhere at NUWC Division, Keyport.

Essential to the successful accomplishment of the vital work performed in this facility in support of the Fleet, are the highly skilled personnel with a combined total of over 2,700 years of specialized combat systems experience.

**2. Indicate whether the facility/equipment is portable, moveable or fixed as defined by paragraph 6, 12 of this data call.**

Because of the dedicated nature of this facility - focused on maintaining readiness of Fleet operational systems with the resulting extensive set of combat system labs integrated with Fleet readiness process labs - and because the building was designed specifically to meet this requirement, this facility is moveable but only at very substantial cost. To relocate this facility would require the construction of a similar facility, as no other exists today with this dedicated and necessary purpose.

**3. Provide the replacement value of the facility/equipment. Report the facility/equipment cost separate from any building and utilities that may be integral to the facility/equipment.**

The replacement value of the Combat Systems Facility is \$164M, of which \$10.5M is for the building.

**4. Provide the gross weight and cube of the facility/equipment.**

The Combat Systems Facility occupies 390,000 cubic feet of space and weighs 311,000 pounds (excluding the building).



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**5. Indicate any "special" utility support required by this facility/equipment other than normal electrical power.**

The Combat System Facility requires special foundations which are individually customized to allow the installation of the combat systems to this specific building, as well as special cableways and water cooling and non-typical shorebased power requirements, including 400 Hz, 3-phase power. Open SECRET control is required. The Combat System Facility is also equipped with a single point digital ground which is critical for the operation of highly complex digital electronic combat systems. A high bandwidth computer networking is required both internal and external to the facility for electronic transfer of data. Compressed air is required to all shop areas as well as ceiling cranes. A subfloor fire suppression system (vice the more common overhead sprinkler system) is required in all system labs.

**6. Indicate any special budget requirements for the facility/equipment (i.e., special foundations, non-ferrous materials, shielding, hardening, etc.).**

Budget requirements to maintain this facility are very low as most costs were up front to establish the facility and have been incurred. Budget requirements based on a relocation of this facility are extensive to meet the requirement of Question 5 above.

**7. State any environmental control requirements for the facility/equipment (i.e., temperature, humidity, air scrubbing).**

The Combat Systems Facility requires a temperature and humidity controlled environment for operation of system labs. Additionally, air scrubbers are required for depot repair operations to remove and clean the air from depot and industrial operations.

**8. Indicate if this facility/equipment would be extremely difficult or impossible to replicate or relocate at another site and the impact to the Department of the Navy if this facility/equipment were lost. Consider existing Government-wide and commercial capabilities as the replication and impact statements are formulated.**

Building 1050 in which the Combat Systems Facility is located was designed and constructed specifically for the purpose of providing cost-effective solutions to maintaining Fleet combat systems in a state of high readiness through in-service support. The specific nature of the building makes relocation of this facility not feasible. The relationship of this facility with other processes performed locally at NUWC Division, Keyport further reduces the feasibility of a relocation. Industrial processes, such as minor fabrication, painting, welding, electrical assembly, and DBOF storerooms, are important and necessary processes in combat system depot operations and are provided outside of this facility. This facility was a MILCON approved for the purpose of consolidating in-service combat systems. By the end of FY94



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and through FY95, this consolidation will be approximately 85% complete. The remaining consolidation, expected to bring this to 90%, is expected to occur early FY96. The facility is fully environmentally compliant and meets or exceeds all current and expected regulations. Because of the specific design and purpose of this facility, relocation is not feasible.

The cost of this building alone was \$10.5M. The cost to install and make operational all labs within this building costs \$1.9M. Replication of this facility would therefore be costly.

The loss of this facility would greatly impact the Department of Navy. Combat systems today are being held in the Fleet past the life they were originally programmed for, creating a greater need now and an increasing need in the future for this facility. Technology is not only advancing, it is accelerating, making obsolete at a greater rate the electronic components used in the combat systems deployed in the Fleet. Providing cost effective solutions is critical in the budget environment that exists and that is forecasted to persist in DoN for the foreseeable future. Returning equipment to the Fleet in a restored condition allows the Fleet to maintain on station without constant failure and burdensome workload. Ensuring continued sources of spare parts and accurate technical manuals allow the Fleet to repair failures quickly. Without this facility, costs to support Fleet systems will increase significantly, and extensive downtime of Fleet systems at sea will occur.

**9. Indicate how and when the facility/equipment was transported and or constructed at the site.**

Building 1050 was a MILCON approved in the FY91 MILCON program. Due to the DoD MILCON moratorium placed prior to the decisions of BRAC91, the requirement for this MILCON was carefully reviewed by the Secretary of Defense and certified as essential in Spring of 1992. The requirement for this facility underwent BRAC review, and the requirement has continually been ratified based on the importance and need for this facility. Construction began in June of 1992, with a BOD occurring in January of 1994. Facility labs are currently in process of installation, with an estimated completion of August 1994 when full capability will be available.

**10. List the functional support areas (previously provided in Tab A) that this facility/equipment support. Refer to Appendix A for the list of Functional support areas.**

- 2. Weapons Systems
  - 2.9 Fire Control
- 5. Sensors & Surveillance Systems
  - 5.1 Sonar Systems



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**11. Provide the historical utilization average for the past five fiscal years (1989-1993). Define the unit of measure used.**

Fiscal Year 1994 will be the first year of operation for this facility.

**12. Provide the projected utilization data out to FY 1997.**

The Combat Systems Facility is projected at the following utilization based on the continued consolidation of combat systems into this facility.

<u>FY94</u>	<u>FY95</u>	<u>FY96</u>	<u>FY97</u>
35%	85%	90%	90%

**13. What is the approximate number of personnel used to operate the facility/equipment?**

There are currently 241 government full-time personnel assigned to this facility.

**14. What is the approximate number of personnel needed to maintain the equipment?**

<u>Lab</u>	<u>Number of personnel</u>
Submarine systems	2
Surface systems	1
Process systems	2

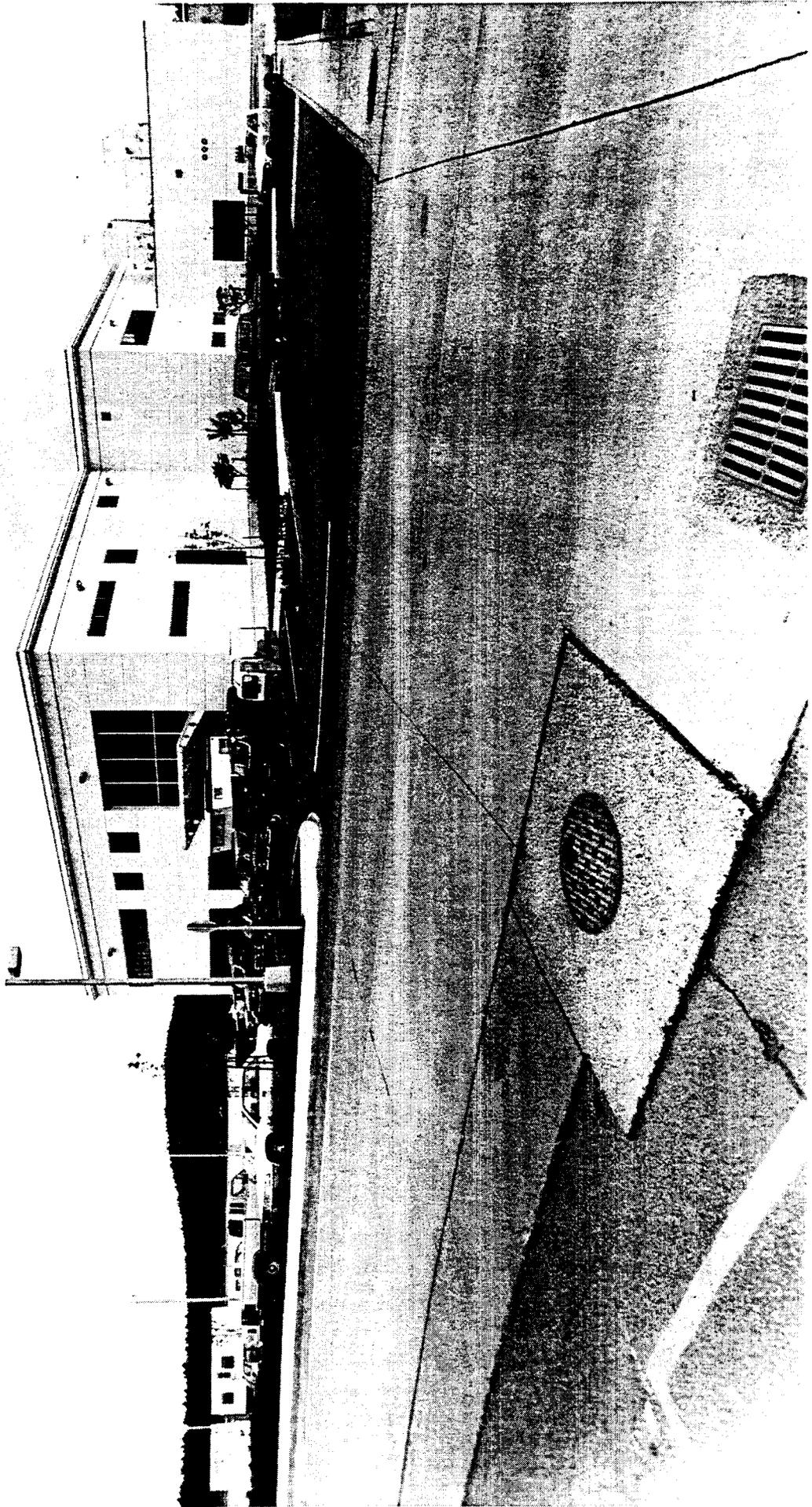
**15. Provide one 8 1/2 X 11 black and white photo of the facility/equipment.**

See attached.



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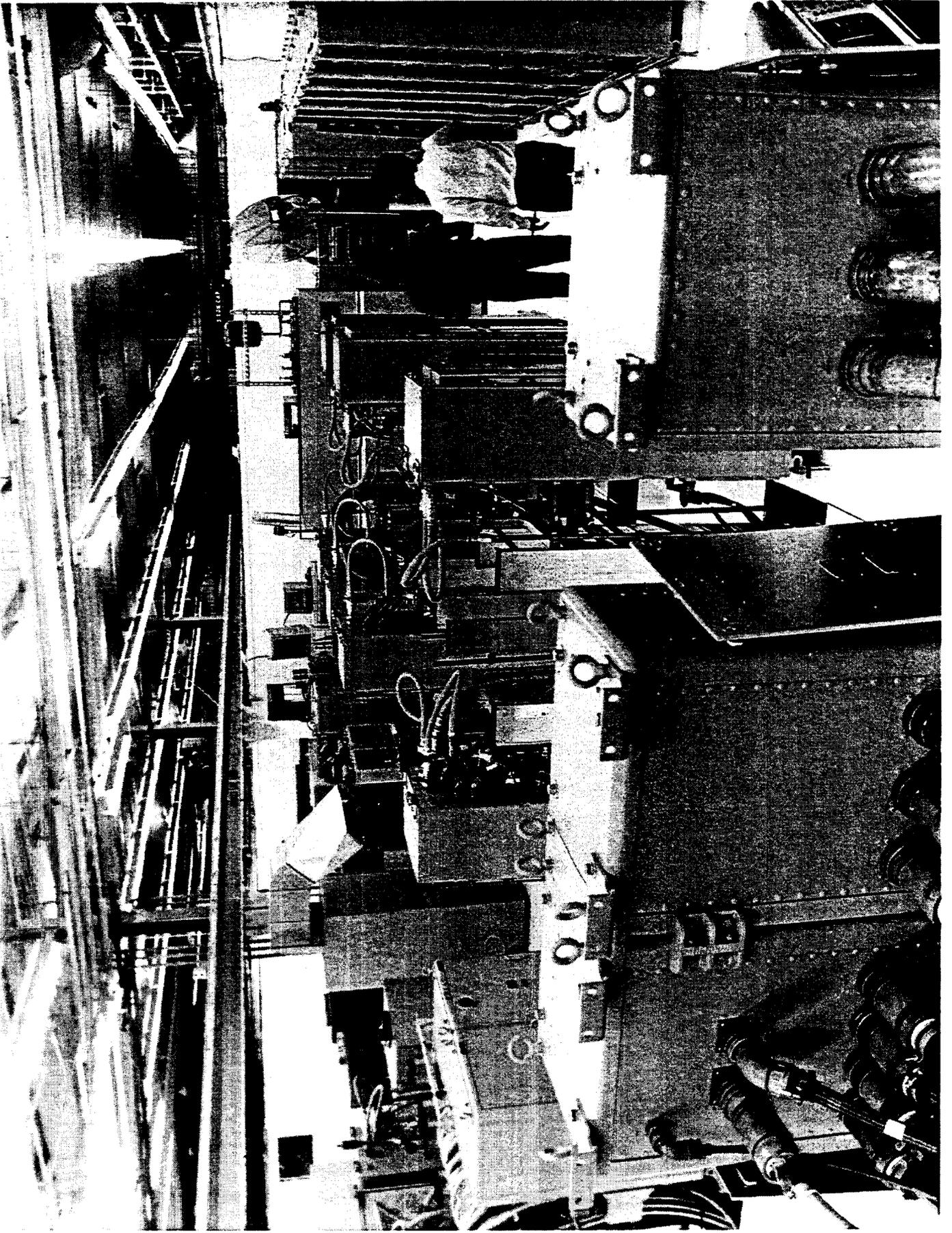


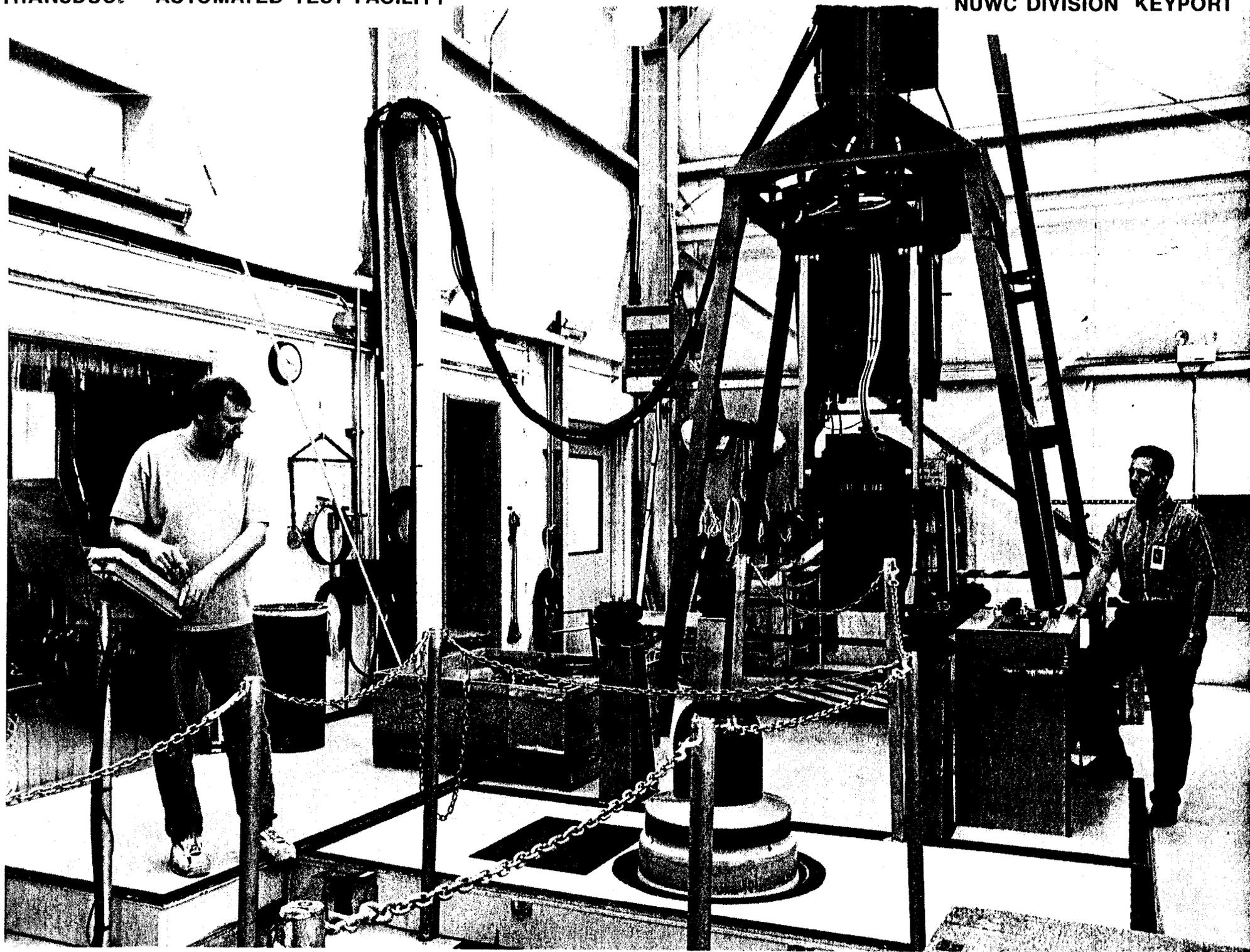
**COMBAT SYSTEMS FACILITY**

**NUWC DIVISION, KEYPORT**

COMBAT SYSTEMS FACILITY

NUWC DIVISION, KEYPORT





**SPECIAL FACILITIES AND EQUIPMENT  
FACILITIES/EQUIPMENT CAPABILITY FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Facility/Equipment Nomenclature or Title	Weapon Acceptance and Operational Test Facility

**1. State the primary purpose(s) of the facility/equipment.**

The primary purpose of this facility is to provide data reduction and analysis capability for weapon acceptance testing (Proofing), R&D testing, and Operational Testing (conducted by COMOPTEVFOR) for underwater weapons and vehicles. The facility provides state-of-the-art data collection, data reduction, data archiving, and data analysis software and hardware support for analysis and assessment of undersea weapons, vehicles, sensors, and platforms tested on Navy underwater and open ocean ranges. It supports Flagship IMA, Depot, and Weapons Acceptance Testing, and provides a secure network linking the various engineering activities of this Division with the secure computer facility. The facility is housed in the NUWC Division, Keyport's Naval Undersea Warfare Engineering Building, a recently completed major MILCON. By allowing this MILCON project to proceed in a very restrictive MILCON environment, the Navy and Congress confirmed the importance of this effort. The facility is operated and maintained by highly skilled technical personnel with a combined total of over 380 years of specialized experience in computer-aided analysis.

**2. Indicate whether the facility/equipment is portable, moveable or fixed as defined by paragraph 6, 12 of this data call.**

The Weapon Acceptance and Operational Test Facility consists primarily of main-frame computers clustered together, associated mass storage and magnetic tape subsystems, lab equipment for data reduction and data extraction, and analysis workstations networked together in a cohesive environment. This facility, according to the definition, can be relocated without damage and is therefore considered "moveable." However, moving this facility will impact existing production and destroy the synergism between the multiple functions utilizing this facility.



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**3. Provide the replacement value of the facility/equipment. Report the facility/equipment cost separate from any building and utilities that may be integral to the facility/equipment.**

The replacement value of the Weapon Acceptance and Operational Test Facility is \$5,903,000. This includes the cost of the data distribution/storage facility, the computer room/environment, the analysis workstations, and the FDDI network that connects them. This cost includes the necessary construction costs of fabricating the network cabling and creating the computer cluster environment within the present building (assuming it remains one central building).

**4. Provide the gross weight and cube of the facility/equipment.**

The Weapon Acceptance and Operational Test Facility occupies 100,600 cubic feet of space and has a gross weight of 95 tons.

**5. Indicate any "special" utility support required by this facility/equipment other than normal electrical power.**

The Weapon Acceptance and Operational Test Facility must reside in a temperature and humidity controlled environment. Also, to reliably maintain optimum analysis capacity, the facility must be electrically connected to an Uninterruptable Power Supply.

**6. Indicate any special budget requirements for the facility/equipment (i.e., special foundations, non-ferrous materials, shielding, hardening, etc.).**

The Weapon Acceptance and Operational Test Facility is a secure facility operating in a classified SECRET environment. The facility must operate in a TEMPEST certified activity.

**7. State any environmental control requirements for the facility/equipment (i.e., temperature, humidity, air scrubbing).**

The Weapon Acceptance and Operational Test Facility requires a temperature and humidity controlled environment for sustained operation.

**8. Indicate if this facility/equipment would be extremely difficult or impossible to replicate or relocate at another site and the impact to the Department of the Navy if this facility/equipment were lost. Consider existing Government-wide and commercial capabilities as the replication and impact statements are formulated.**



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**Replication/relocation:** This facility and equipment are unique in that it provides synergism between the various Navy ranges, and the Pacific Northwest ranges in particular, and the engineers involved in the programs utilizing these ranges. Data becomes available in nearly realtime for analysis and assessment, providing rapid turnaround of hardware and optimizing the "test to decision" evolution. Replication or relocation would destroy gains in data and hardware throughput and productivity, which are directly related to the physical proximity between the test ranges, this facility, the program engineering areas, and the secure data network which links them all together. The proprietary nature of the data analyzed for COMOPTEVFOR requires "trusted agents," which would be a difficult operation to duplicate in a commercial facility.

**Impact if facility lost:** There is no other Government or commercial facility which has the capability to provide the same support over the same scope of programs as this facility. The data necessary to be evaluated to support decision making processes for weapon acceptance testing, research and development, and other programs would not be available. Currently, this facility and equipment are provided to the multiple programs on a cost-sharing basis, which allows even small programs to take advantage of the state-of-the-art data processing and analysis capabilities that otherwise they could not afford or that would cause significant program impact to reproduce.

**9. Indicate how and when the facility/equipment was transported and or constructed at the site.**

The transportation and construction of the facility has been incremental. The facility was started in 1983 as a pilot project in support of the MK 48 ADCAP Torpedo program. The pilot project was successful, such that the facility was expanded to support additional projects including the MK 46, MK 48, and the MK 50 Torpedo programs. The additional projects the facility attracted; the evolving requirements for more thorough, integrated analyses; rapidly developing computer technology; and the need to avoid expensive maintenance of obsolete equipment lead to three major revisions starting in 1984, 1987, and 1992. The 1992 revision is currently being concluded.

**10. List the functional support areas (previously provided in Tab A) that this facility/equipment support. Refer to Appendix A for the list of Functional support areas.**

- 2. Weapon Systems
  - 2.4 Torpedoes
  - 2.5 Mines
  - 2.9 Fire Control
- 5. Sensors & Surveillance Systems



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- 5.1 Sonar Systems
- 7. Command, Control, Communications and Intelligence
  - 7.1 Submarine
- 8. Defense Systems
  - 8.2 Countermeasures (CM)
- 10. General Mission Support
  - 10.7 Major Range Development and Operation

**11. Provide the historical utilization average for the past five fiscal years (1989-1993). Define the unit of measure used.**

The Weapon Acceptance and Operational Test Facility has been utilized at the rate of approximately 95 percent from 1989 to 1993. This statistic is based upon the average number of underwater vehicle runs per year since 1989. That average is 1,196 runs. The utilization measurement was based upon the number of runs being analyzed and evaluated.

**12. Provide the projected utilization data out to FY 1997.**

The utilization of this system is projected to be approximately 85 percent out to 1997.

**13. What is the approximate number of personnel used to operate the facility/equipment?**

The number of people required to operate the facility is 21.

**14. What is the approximate number of personnel needed to maintain the equipment?**

The number of people required to maintain the equipment is five.

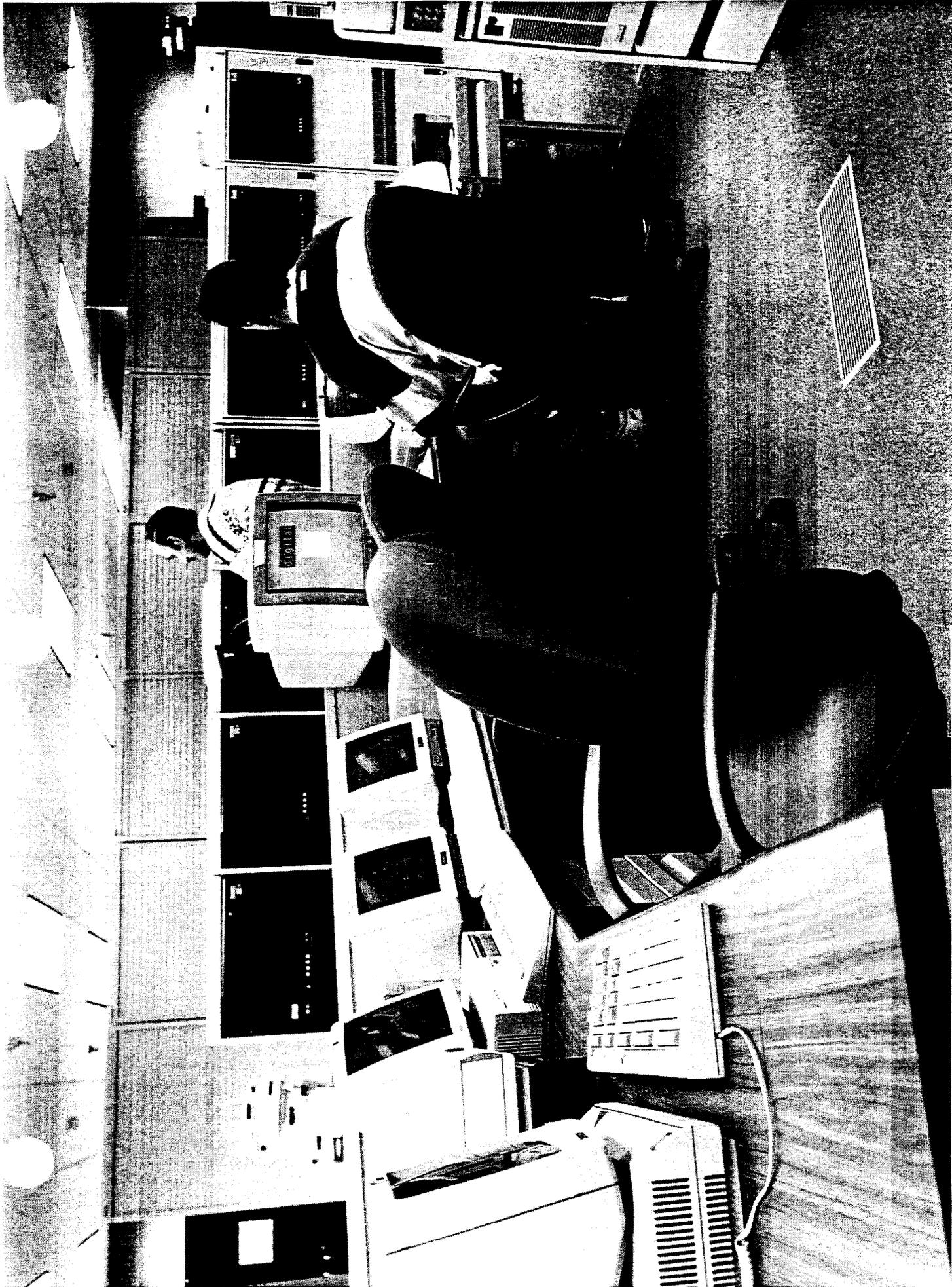
**15. Provide one 8 1/2 X 11 black and white photo of the facility/equipment.**

Attached is the photo depicting only part of the facility. The facility occupies several thousand square feet of floor space, and it is impossible to capture the entire facility in one photo. The one attached shows the operator's station with part of the magnetic tape subsystem in the background.



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WEAPON ACCEPTANCE AND OPERATIONAL TEST FACILITY

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**SPECIAL FACILITIES AND EQUIPMENT  
FACILITIES/EQUIPMENT CAPABILITY FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Facility/Equipment Nomenclature or Title	Underwater Noise Analysis Facility (UNAFAC)

**1. State the primary purpose(s) of the facility/equipment.**

The Underwater Noise Analysis Facility (UNAFAC) comprises state-of-the-art signal playback, processing, and analysis systems used in the assessment of the acoustic performance of torpedoes, countermeasures, acoustic targets, and other autonomous underwater vehicles (AUV). It is operated and maintained by highly skilled engineers and technicians with unique expertise and a combined total of 174 years of specialized experience in underwater noise analysis. This highly specialized, technical facility is operated in conjunction with several acoustic acquisition systems which are deployed at range sites and provide data recordings of active and passive acoustic events. Typical applications include:

**Production Acceptance (Proofing):** The radiated noise signature from an individual vehicle or torpedo is determined and statistically compared to class signatures derived for a given production lot. As one of several measures, this data is used when deciding to accept or reject the particular unit from the manufacturer. Emphasis is on obtaining a highly controlled measurement in which conditions vary as little as possible from one unit to the next. Elaborate hardware and software systems are employed in UNAFAC to compensate for the complex effects of multipath acoustic propagation and Doppler effects. This type of work constituted the major portion on the workload of UNAFAC during the past decades.

**Radiated Noise Silencing:** In addition to the need to provide the high accuracy measurements of the radiated noise signature as described above, special capabilities are employed to obtain valid data in low signal-to-noise conditions, measure structureborne vibration levels and resulting transfer functions for radiated noise, and diagnose the sources of particular signature components. This work requires a great deal of expertise on behalf of the acoustic analysts, consisting primarily of master's level engineers, to interpret data and report on acoustic findings. This work currently represents the largest portion of the UNAFAC workload, supporting both torpedo and AUV silencing programs within the Navy.

**Special Analysis:** Several special purpose analysis functions are supported within the UNAFAC. First is the measurement and analysis of signal energy and worst-case detectability



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of transient events for such events as torpedo launches and manned-activity aboard ships. Another capability is the measurement of acoustic signals to frequencies as high as 400 kHz. Also supported are frequency-versus-time characterizations of active acoustic signal, echo returns, and corresponding target strength.

**Support Functions:** Special support functions existing within UNAFAC include recording reproduction, on-site data review, and signal synthesis. The recording reproduction includes extensive analog-to-analog and analog-to-digital recording reproduction capabilities to allow additional data analysis at remote sites. Synthesis of acoustic waveforms can be produced from both predefined and measured signatures to support decoys such as the Mobile Submarine Simulator (MOSS) and evaluation of acoustic detection systems. Finally, the UNAFAC provides for coordinated playback and display of vehicle track, acoustics, and spectra to provide weapons engineers working at the UNAFAC, a cohesive assessment of their vehicle's acoustic performance.

The UNAFAC is colocated in the computer facility within the new Naval Undersea Warfare Engineering building at Keyport, a recently completed major MILCON. By allowing this MILCON project to proceed in a very restrictive MILCON environment, the Navy and Congress confirmed the importance of this effort. This site supports the central analysis of data acquired at each of the Pacific Northwest Range sites and is efficiently located proximate to weapons test engineers for both the design of weapons test scenarios and the subsequent data analysis. UNAFAC supports the weapon upgrade initiatives of NAVSEA and its contractors' research and development efforts in silencing, AUV guidance and control technologies, and any other applications in which underwater radiated noise is a concern.

**2. Indicate whether the facility/equipment is portable, moveable or fixed as defined by paragraph 6, 12 of this data call.**

The UNAFAC is a moveable facility. It is comprised mainly of rack-mounted instrumentation and computer systems and computer workstations. However, the heavy reliance on analog signals requires a significant amount of facility preparation and diagnostics after moving to achieve electrical noise levels which do not interfere with UNAFAC operations. Total costs for facility preparation, systems installation, and electrical noise mitigation are estimated at \$500K exclusive of personnel moving costs.

**3. Provide the replacement value of the facility/equipment. Report the facility/equipment cost separate from any building and utilities that may be integral to the facility/equipment.**

The total systems inventory associated with UNAFAC is estimated at \$2.6M. This estimate is broken down as follows:



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Tape playback and recorders	\$1,000K
Spectral analysis instrumentation	\$ 500K
Computer workstations	\$ 150K
Vector processing system	\$ 500K
General purpose test equipment	\$ 350K
Support hardware	\$ 100K

**4. Provide the gross weight and cube of the facility/equipment.**

The volume associated with the UNAFAC is 40,000 cubic feet. The gross weight, excluding structure, is estimated to be 16,500 pounds.

**5. Indicate any "special" utility support required by this facility/equipment other than normal electrical power.**

The UNAFAC requires special power distribution, grounding, and shielding systems. The ground reference between any racks within the facility must not exceed 5 millivolts total voltage difference in order to maintain the -90 dBv electrical noise floor required for analysis of recorded data. Additionally, electromagnetic influence (EMI) on low-level signals must be held to comparably low levels.

**6. Indicate any special budget requirements for the facility/equipment (i.e., special foundations, non-ferrous materials, shielding, hardening, etc.).**

Optimal performance of systems within the UNAFAC are achieved with an isolated, single-point grounded power distribution system and a shielded enclosure for EMI protection. Adequate physical security, including audio isolation, must be achieved to support work at the SECRET level.

**7. State any environmental control requirements for the facility/equipment (i.e., temperature, humidity, air scrubbing).**

The computer room must have temperature and humidity control. Electrical power must be conditioned and uninterruptible.

**8. Indicate if this facility/equipment would be extremely difficult or impossible to replicate or relocate at another site and the impact to the Department of the Navy if this**



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**facility/equipment were lost. Consider existing Government-wide and commercial capabilities as the replication and impact statements are formulated.**

Relocation of UNAFAC would not be impossible, but it would be extremely difficult, time-consuming, and expensive. During the period of the move, the Navy would lose much of its acoustic analysis capacity.

**9. Indicate how and when the facility/equipment was transported and or constructed at the site.**

The UNAFAC was moved to a new site at Keyport and became operational in January 1994. The move was accomplished using contracted movers with the computer equipment being moved and checked-out by the vendor, Hewlett Packard. The UNAFAC was installed within a newly built computer facility that required substantial modifications to meet UNAFAC requirements. A specially built wall has been built around the UNAFAC area to provide the acoustic attenuation necessary to safeguard the SECRET-level audio work.

**10. List the functional support areas (previously provided in Tab A) that this facility/equipment support. Refer to Appendix A for the list of Functional support areas.**

2.4 Torpedoes  
10.7 Major Range Development and Operation

**11. Provide the historical utilization average for the past five fiscal years (1989-1993). Define the unit of measure used.**

It is difficult to quantify the work in terms of the number of tests supported or reports produced because the magnitude of work involved in each case varies dramatically from as little as 4 to as high as 500 hours of work. The total workload, on an annual basis, has reduced slightly from a level of roughly eleven work years to 9.5 work years over this 5-year period.

**12. Provide the projected utilization data out to FY 1997.**

The acoustic measurement workload of the UNAFAC is expected to hold steady or decrease slightly through 1997. Upgrade programs involving both the heavyweight ADCAP torpedo and the lightweight torpedoes, as well as continuing work in the AUV area, will provide for most of the workload. While the total number of runs is lower than prior years, the amount of technically specialized work associated with each has increased in proportion to the importance of the acoustic data for these programs.



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**13. What is the approximate number of personnel used to operate the facility/equipment?**

Eight engineers and two technicians operate the systems within the UNAFAC and produce the acoustic measurement data products. Data interpretation and subsequent direction for processing methods generally require master's degree level of education.

**14. What is the approximate number of personnel needed to maintain the equipment?**

Two people are required to provide the hardware maintenance.

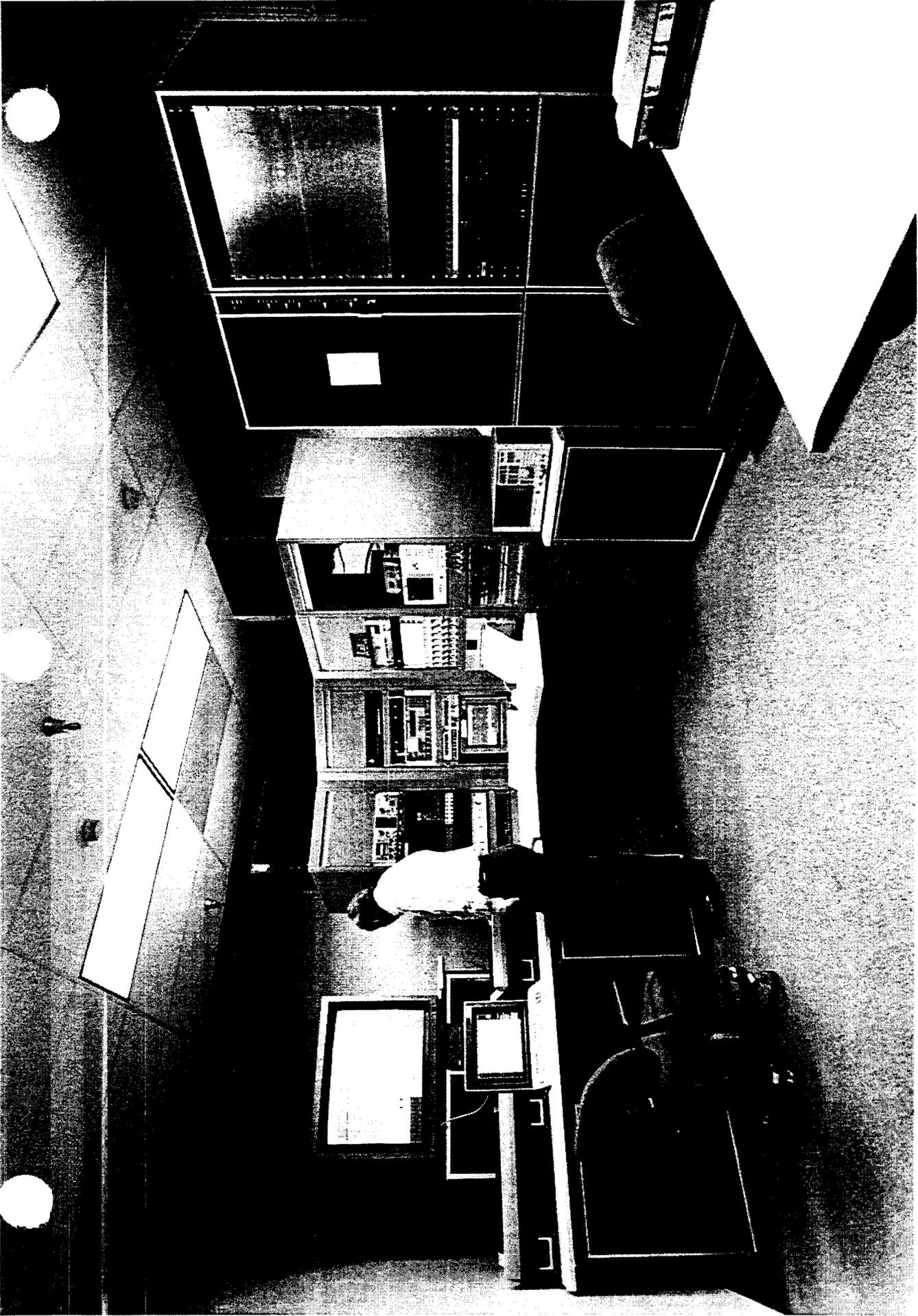
**15. Provide one 8 1/2 X 11 black and white photo of the facility/equipment.**

Attached.



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**UNDERWATER NOISE ANALYSIS FACILITY**

**NUWC DIVISION, KEYPORT**

**SPECIAL FACILITIES AND EQUIPMENT  
FACILITIES/EQUIPMENT CAPABILITY FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Facility/Equipment Nomenclature or Title	Light Industrial Support Facility

**1. State the primary purpose(s) of the facility/equipment.**

The Keyport Division of the Naval Undersea Warfare Center has unique industrial capabilities established for fabrication, assembly, and test of electrical/electronic/mechanical components and assemblies of undersea weapons, countermeasures, targets, combat systems, and similar products. This is the Navy's only organic Light Industrial Support Facility for USW torpedoes, countermeasures, targets, and undersea combat systems. This is in support of Fleet maintenance, depot, and repair operations. In addition, these capabilities support fabrication of parts and components for R & D and prototype hardware. Keyport fabricates hardware to drawings for obsolete parts and for last-source and small-lot quantities of electrical/electronic/mechanical components to maintain Fleet readiness. Keyport fabricates Fleet hardware on short notice when other sources fail to deliver in time for deployment.

This Light Industrial Support Facility supports Keyport depot operations to ensure repaired items are delivered to the Fleet on time. This facility is essential for supporting Fleet needs in the event of war. It provides a surge capability for emergency repairs, enhances the depot's capability to maintain Fleet weapon system readiness, and ensures sustainability of Fleet readiness in the future. The successful production history and this Division's leadership role in the development and application of new technologies for industrial processes such as Robotics, Computer Aided Design, Computer Aided Manufacturing, Flexible Computer Integrated Manufacturing, and Electronic Data Interchange demonstrates Keyport's capability to economically fabricate hardware quickly to military standards and specifications. Keyport has facilities in place for machining, heat-treating, anodizing, plating, flow soldering, electronic assembly, electronic component insertion, conformal coating, cable manufacturing, molding, hydrostatic testing, welding, epoxy and powder painting, and other industrial processes. Keyport also has comprehensive facilities required for environmental testing (shock, vibration, hot, cold, humidity, salt spray) and non-destructive testing of production hardware. These facilities and equipment contribute synergistically to USW repair/depot functions to provide a comprehensive industrial capacity with the skilled work force necessary to maintain a high quality torpedo light industrial base at a competitive cost. This workforce



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is essential to the Light Industrial capability and provides a combined total of over 4,700 years of applicable specialized experience in the skills needed to support this vital function.

**2. Indicate whether the facility/equipment is portable, moveable or fixed as defined by paragraph 6, 12 of this data call.**

Most of the facilities and equipment in this Light Industrial Facility are fixed due to their size, weight, and need for special mounting platforms, ventilation, lighting, and electrical power. Hazardous waste considerations further fix the location of equipment due to the requirement of containment, filters, hard piping, etc. Many of the small items that could be considered portable are in reality fixed, since they are integral to the processes and are used and needed near the fixed equipment.

**3. Provide the replacement value of the facility/equipment. Report the facility/equipment cost separate from any building and utilities that may be integral to the facility/equipment.**

Keyport has an extensive Light Industrial Support Facility with substantial investments in a wide variety of specialized equipment and computer controlled machinery. The facility comprises many buildings which, in some cases, are specially designed for specific equipment and/or processes. The replacement value of these facilities is approximately \$20M. The replacement value of the equipment in this Light Industrial Support Facility is approximately \$40M. Of this equipment, 19 items have replacement values of over \$500K. These pieces of equipment alone represent a total replacement cost of approximately \$16 million (including tooling, installation, and setup). These costs are based on FY 94 dollars.

**4. Provide the gross weight and cube of the facility/equipment.**

Keyport's Light Industrial Support Facility comprises various buildings that buildings represent in excess of 100,000 square feet of industrial shop space. The weight and size information for equipment with replacement costs of over \$500K is 395 tons and 77K cubic feet.

**5. Indicate any "special" utility support required by this facility/equipment other than normal electrical power.**

The facility/equipment requires many "special" utilities in addition to normal electrical power. Most of the expensive heavy equipments require specially designed foundations, multiphased high wattage power, environmentally compliant ventilation systems compatible to the surroundings, waste piping and reservoirs, lighting, and gas/fluid filters.



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**6. Indicate any special budget requirements for the facility/equipment (i.e., special foundations, non-ferrous materials, shielding, hardening, etc.).**

There are no additional special budget requirements for these facilities. A comprehensive review of future requirements has verified that these facilities have been sufficiently maintained/upgraded to ensure mission and compliance requirements are supported well into the future.

**7. State any environmental control requirements for the facility/equipment (i.e., temperature, humidity, air scrubbing).**

Environmental/process control equipment is an integral part of many of the manufacturing processes. Specialized equipment requires general and/or controlled exhaust systems, temperature controllers, and humidity control.

Air-emission control equipment is installed and in use in all production areas that could potentially release heavy metal dust and solvent fumes. NUWC Division, Keyport meets or exceeds all EPA and Washington State environmental requirements.

**8. Indicate if this facility/equipment would be extremely difficult or impossible to replicate or relocate at another site and the impact to the Department of the Navy if this facility/equipment were lost. Consider existing Government-wide and commercial capabilities as the replication and impact statements are formulated.**

The Keyport Light Industrial Support Facility would be extremely difficult and costly to replicate or relocate at another site. This is the Navy's only Organic Light Industrial Support Facility for torpedoes, countermeasures, targets, and undersea combat systems. Many of the buildings housing the unique machines and equipment to provide this capability have been built and/or configured with unique environmental attributes and construction amenities to support their use. The facilities are environmentally compliant with extensive exhaust, ventilation, and hazardous waste containment systems. They are integrated with NUWC Division, Keyport's Industrial Waste Treatment Facility for efficiencies and environmental compliance. The facilities include special foundations and mounting platforms for equipment accommodation. Most of these machines and equipment can not be relocated without extensive construction or reconfiguration. The financial investment by the Navy to create these capabilities has been extensive. In some cases, capabilities were specifically sited at Keyport to provide an assured source of supply when the original equipment manufacturer no longer was able or willing to provide support. The facilities and equipment are synergistic with the existing depot, range, and environmental test capabilities.



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Loss of these facilities and equipment would result in severe and immediate adverse impacts on Fleet readiness, and would hinder our nation's ability to reconstitute its USW torpedo inventory should such action be required.

**9. Indicate how and when the facility/equipment was transported and or constructed at the site.**

In general, large equipment was installed by the vendor over the last 20+ years. Many of the installations required extensive facility modifications and new foundations to accommodate the equipment. For safety and environmental compliance, many machines require installation of extensive hazardous waste containment and exhaust/ventilating systems.

**10. List the functional support areas (previously provided in Tab A) that this facility/equipment support. Refer to Appendix A for the list of Functional support areas.**

The NUWC Division, Keyport Light Industrial Support Facility supports the following functional support areas:

- 2. Weapons Systems
  - 2.2 Guided Missiles
  - 2.4 Torpedoes
  - 2.5 Mines
  - 2.9 Fire Control
- 5. Sensors & Surveillance System
  - 5.1 Sonar Systems
- 8. Defense Systems
  - 8.2 Countermeasures (CM)
- 10. General Mission Support
  - 10.2 Logistics Planning and Implementation

**11. Provide the historical utilization average for the past five fiscal years (1989-1993). Define the unit of measure used.**

Over the past five fiscal years, much of the Light Industrial Support Facility has been utilized between two and three shifts. The utilization average based on one shift over the last five years has been approximately 180 percent.



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**12. Provide the projected utilization data out to FY 1997.**

The projected utilization of the Light Industrial Support Facility based on single-shift operation through FY 97 is as follows:

<b>FISCAL YEAR</b>	<b>PROJECTED % UTILIZATION</b>
94	168%
95	142%
96	130%
97	128%

**13. What is the approximate number of personnel used to operate the facility/equipment?**

Based on existing workload, it takes approximately 415 people to operate Keyport's Light Industrial Support Facility.

**14. What is the approximate number of personnel needed to maintain the equipment?**

NUWC Division, Keyport has made substantial investments in specialized equipment and computer controlled machinery to support its Light Industrial Support Facility and to maintain readiness. The Division has invested in new and advanced technology to improve productivity, enhance quality, decrease costs, and reduce hazardous waste. This state-of-the-art unique equipment requires specialized maintenance personnel to maintain efficient operations. Approximately 15 full-time maintenance personnel are required for proper maintenance of this equipment.

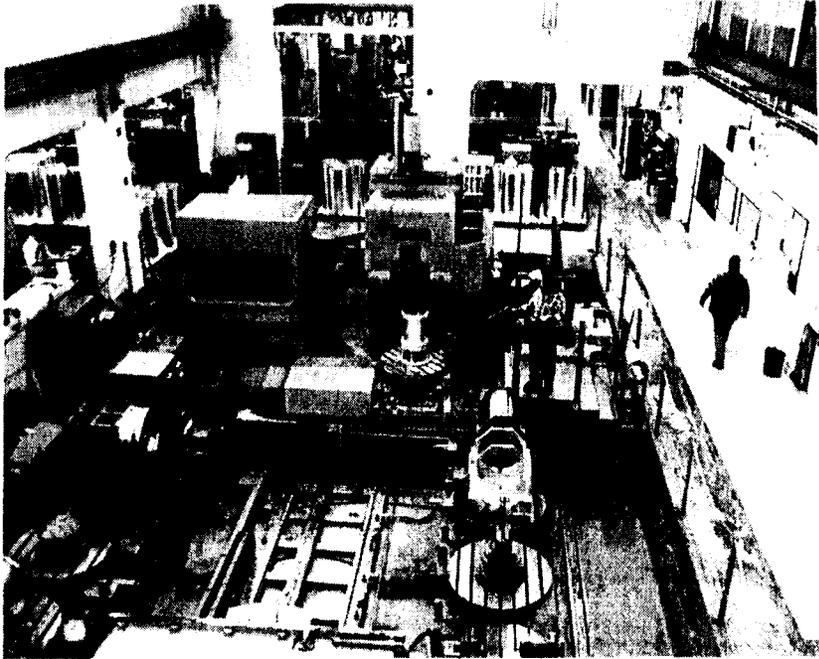
**15. Provide one 8 1/2 X 11 black and white photo of the facility/equipment.**

See attached photos.



**ADMINISTRATIVE SENSITIVE**

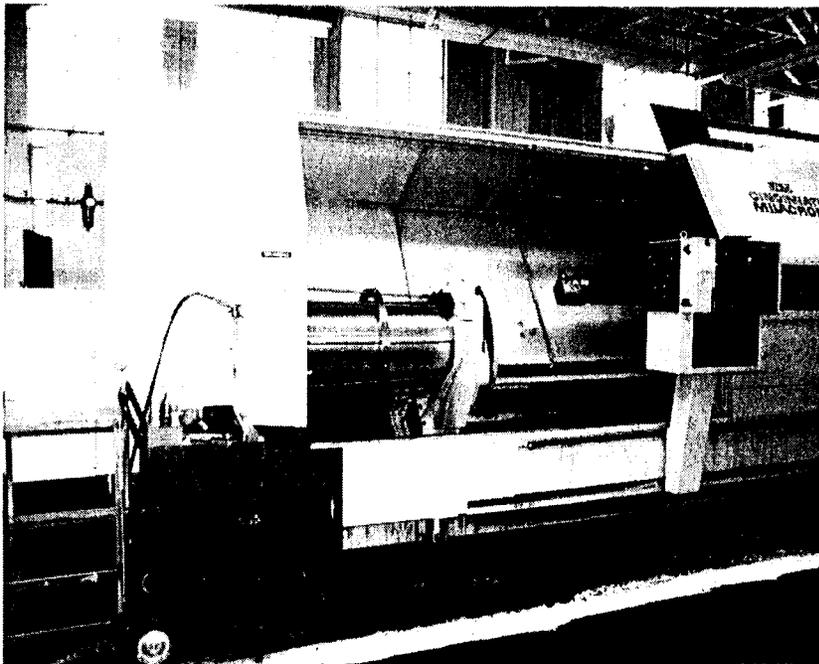
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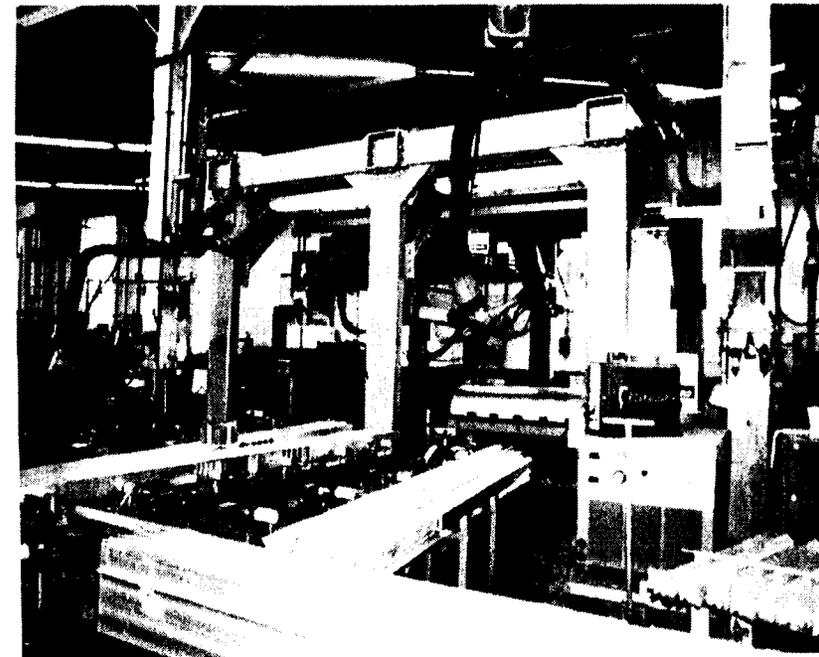
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NUMERICAL CONTROL PUNCH



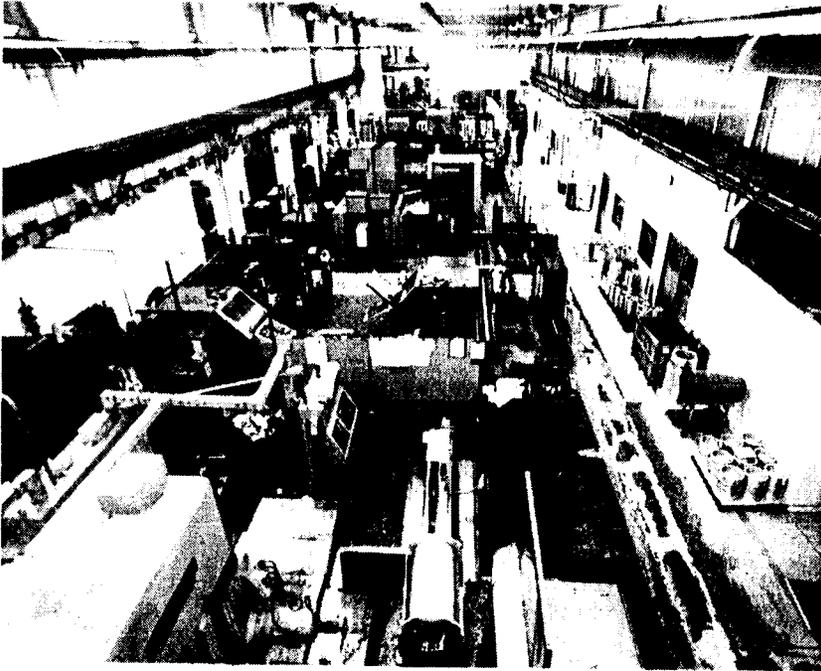
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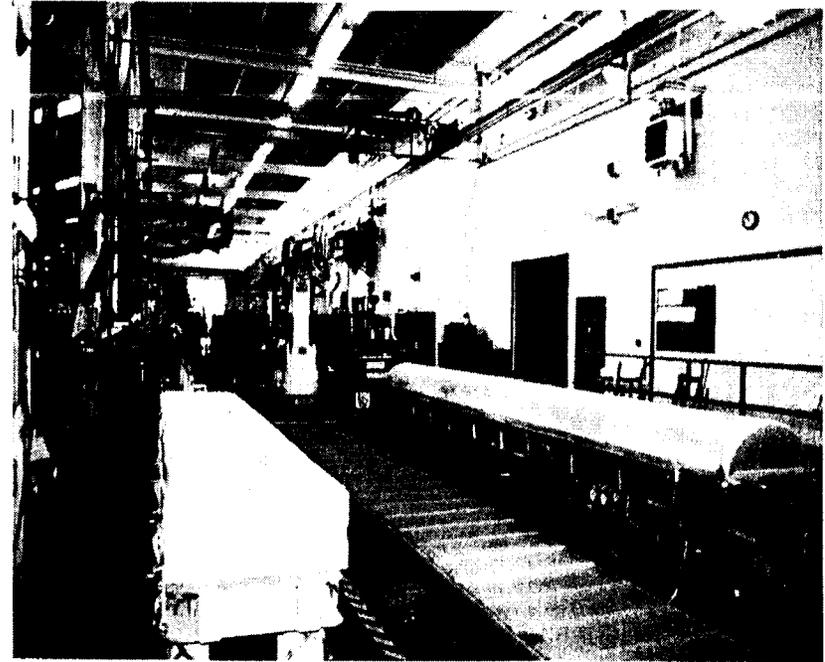
WELDING ROBOT

**LIGHT INDUSTRIAL SUPPORT FACILITY**

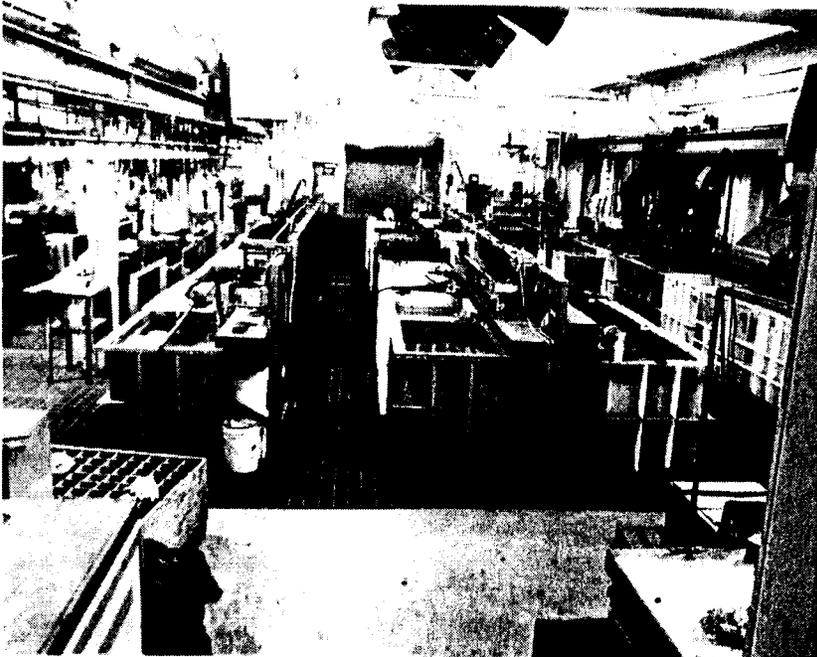
**NUWC DIVISION, KEYPORT**



**MACHINE SHOP**



**WELDING ROBOT**



**PLATING PLANT**



**AUTOMATED PLATING**

**SPECIAL FACILITIES AND EQUIPMENT  
FACILITIES/EQUIPMENT CAPABILITY FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Facility/Equipment Nomenclature or Title	Industrial Waste Treatment Facility

**1. State the primary purpose(s) of the facility/equipment.**

This unique, highly advanced facility was developed to treat complex waste waters generated from the underwater weapons industrial processes used at NUWC Division, Keyport. These facilities treat industrial waste waters from Bldg. 72 (Plating Shop), Bldg. 38 (Metal Shop), Bldg 134 (Photo Lab), Bldg 514 (Refueling Room), Bldg. 84 (Soda Blast Paint Strip Facility), Bldg. 85 (Battery Shop), Bldg. 509 (Oil Tank Pit), Bldg. 820 (Alodine Shop), Bldg. 209 (Otto Fuel Reclamation Facility), and oily bilge water from range craft. This facility reduces 5 million gallons of contaminated waste waters per year into clean water which is then discharged to the Brownsville Sewage Treatment Plant. The facility, staffed by highly skilled, state-licensed, utility system operators with a total of 80 years of specialized experience, is a major, integral part of this Division's Pollution Prevention Program and provides essential support to this Division's mission.

**2. Indicate whether the facility/equipment is portable, moveable or fixed as defined by paragraph 6, 12 of this data call.**

The Industrial Waste Treatment Facility (IWTF) is an extensive combination of fixed buildings, tanks, and double-wall underground piping system. Buildings include the main treatment plant, an adjacent oil/water separation facility, and an Otto Fuel separation facility. These facilities contain tank systems, piping, pumps, valves, alarms, and monitors to efficiently move and control waste water throughout the treatment process. These semi-automated facilities have secondary containment which ensure the protection of human health and preclude the environment from coming into contact with contaminated waste water. The facilities also contain ventilation equipment to maximize worker safety. The state-of-the-art double-walled piping extends throughout most of the industrial section of the base.

**3. Provide the replacement value of the facility/equipment. Report the facility/equipment cost separate from any building and utilities that may be integral to the facility/equipment.**



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These unique facilities are tied together through a network of state-of-the-art double-wall underground piping system. The systems are interdependent to function effectively. The buildings which house these facilities are part of the secondary containment and control systems of the treatment process.

Industrial Waste Treatment Facility - \$3,500K; Oil/Water Separator - \$600K; Otto Fuel Separator - \$400K; Double-wall Underground Piping System - \$1,000K; Total - \$5,500K.

**4. Provide the gross weight and cube of the facility/equipment.**

Industrial Waste Treatment Facility - 250,000 cu. ft.; Oil/Water Separator - 21,000 cu. ft.; Otto Fuel Separator - 15,000 cu. ft.; Double-wall Underground Piping System - 2,500 linear ft.

**5. Indicate any "special" utility support required by this facility/equipment other than normal electrical power.**

This facility uses station air, steam heat, 450 volt electrical service, and water. The facility was designed to existing and available utility services. To reduce costs of operation, the facility utilizes existing waste water sources for additional process water in lieu of using fresh process water. The facility maximizes utilization of service utilities, treatment chemicals, and labor by holding the waste water for bulk storage and treatment.

**6. Indicate any special budget requirements for the facility/equipment (i.e., special foundations, non-ferrous materials, shielding, hardening, etc.).**

There are no additional special budget requirements for these facilities. A comprehensive review of future requirements has verified that these facilities have been sufficiently maintained/upgraded to ensure mission and compliance requirements are supported well into the future.

**7. State any environmental control requirements for the facility/equipment (i.e., temperature, humidity, air scrubbing).**

These facilities handle highly complex contaminated wastes. In order to maintain tight control over the transfer, storage, and treatment of these waste streams, several environmental controls are required to ensure worker safety, protection of the environment, and proper control of the treatment processes. These controls are built into the facilities and do not require any special external support. The following controls are unique to the system:



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- a. Internal leak detection/alarm system within the double-wall piping network and above ground double-wall transfer tanks.
- b. Secondary containment for all treatment process tanks.
- c. Special gas room for housing 1-ton cylinders of chlorine and sulfur dioxide gases. This facility is designed with special sensors and ventilation equipment to ensure prompt warning and response in the event of a gas release.
- d. Freeze protection on all external exposed systems.
- e. Corrosion resistant materials are used throughout the system.
- f. Special sensors and monitors to control chemical reaction rates, chemical feed rates, and sludge-pressure pressures.
- g. Special gas sensors for cyanide, chlorine and sulfur dioxide releases to ensure immediate detection and early warning for worker response and safety.
- h. Self contained, fully closed-loop systems to ensure zero exposure to workers and eliminate risk of releases into the environment.

**8. Indicate if this facility/equipment would be extremely difficult or impossible to replicate or relocate at another site and the impact to the Department of the Navy if this facility/equipment were lost. Consider existing Government-wide and commercial capabilities as the replication and impact statements are formulated.**

The complex integration of these facilities into the mission-essential industrial processes would make it extremely difficult and cost prohibitive to replicate or relocate these facilities elsewhere. These facilities are uniquely designed to handle the waste stream from torpedoes, (i.e., Otto fuel, lithium, cyanide, etc.) and therefore do not exist elsewhere, as Keyport is the Navy's only torpedo depot. The network of double-wall piping and storage system is a unique design which safely transports and stores waste waters from processes to the treatment facilities. The treatment processes are unique to the industrial processes and mission at this Division. Loss of these facilities would require labor intensive transport and storage of 5 million gallons of waste water annually. The costs would exceed ten times the existing operational costs. There are no commercial facilities available locally or nationally which combine the capabilities of Otto fuel separation, chrome reduction, cyanide destruction, oil/water separation, and heavy metals removal in an integrated system such as these facilities. This combination of processes allows NUWC Division, Keyport to handle and treat unique waste streams as well as conventional wastes.



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**9. Indicate how and when the facility/equipment was transported and or constructed at the site.**

The original treatment facility (Bldg. 825) and piping system network was constructed and put into operation in 1982. Upgrades and additions to the basic facility have occurred to support mission requirements and maintain full compliance. These upgrades and additions include:

Otto Fuel Separation Facility - 1983; Oil/Water Separation Facility - 1992; Double-Wall Piping Network - 1993; Above Grade Sump (B489) - 1990; Above Grade Sump (B514) - 1992; Above Grade Sump (B72) - 1993; Sludge Press replacement (B825) - 1992; NFESC Treatment Upgrade (B825) - 1994.

**10. List the functional support areas (previously provided in Tab A) that this facility/equipment support. Refer to Appendix A for the list of Functional support areas.**

- 2. Weapons Systems
  - 2.4 Torpedoes
  - 2.5 Mines
  - 2.9 Fire Control
- 5. Sensors and Surveillance Systems
  - 5.1 Sonar Systems
- 8. Defense Systems
  - 8.2 Countermeasures (CM)
- 10. General Mission Support
  - 10.7 Major Range Development and Operation
  - 10.9 Activity Mission and Function Support

**11. Provide the historical utilization average for the past five fiscal years (1989-1993). Define the unit of measure used.**

The facility operates at 100% utilization with the exception of 2 days every 5 years to perform maintenance and replace filter media. The unit of measure is the percentage of operation based on the number of operating days per 365 days per year. Normal operation is characterized by 24 hours per day, 7 days per week, 365 days per year.

**12. Provide the projected utilization data out to FY 1997.**

Projected utilization remains 100% in the outyears.



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**13. What is the approximate number of personnel used to operate the facility/equipment?**

The appropriate number of personnel required to operate the facility is four. This work is performed by highly skilled, state licensed, utility system operators.

**14. What is the approximate number of personnel needed to maintain the equipment?**

Only one person is required to maintain the equipment.

**15. Provide one 8 1/2 X 11 black and white photo of the facility/equipment.**

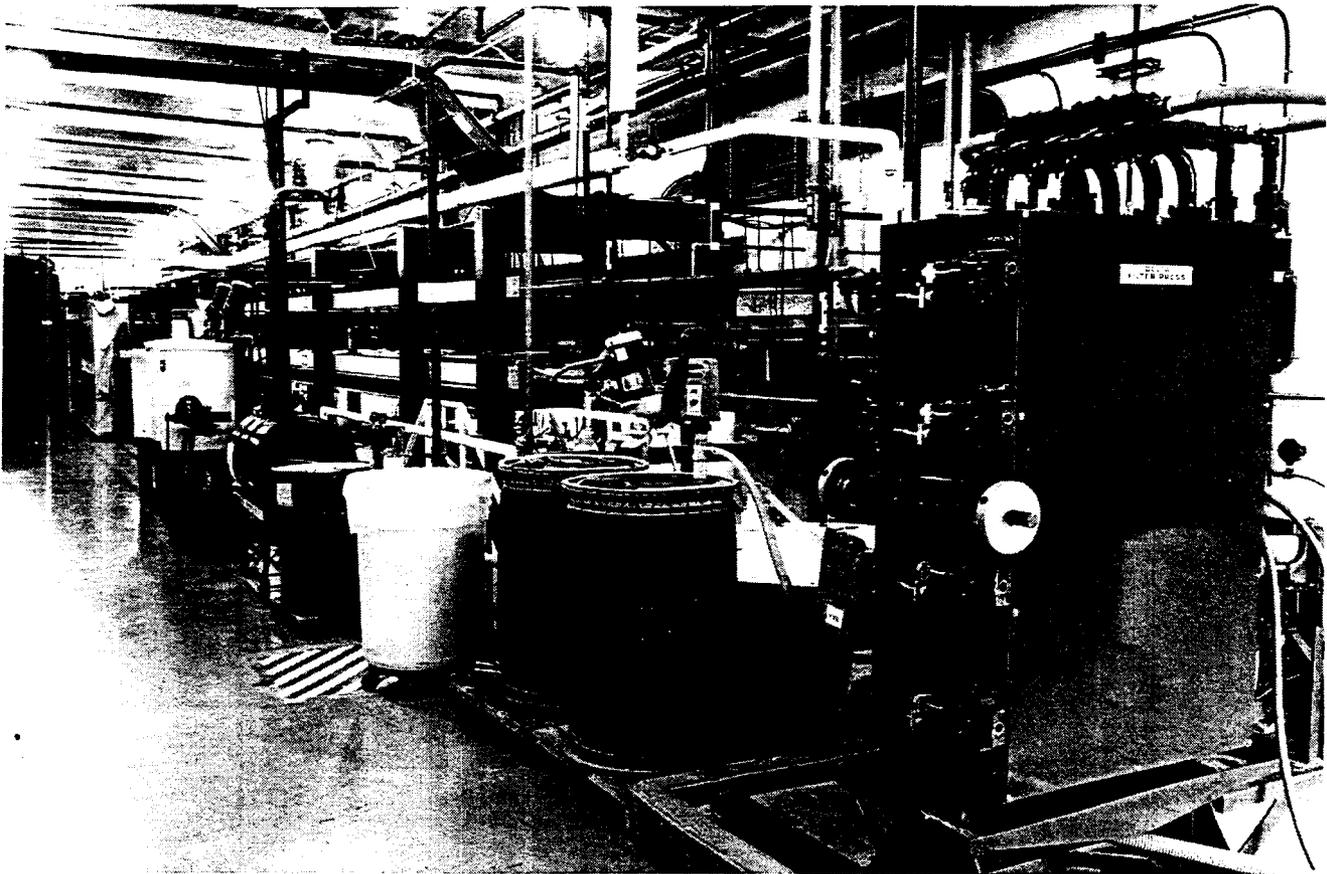
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**ADMINISTRATIVE SENSITIVE**

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**INDUSTRIAL WASTE TREATMENT FACILITY**



**NUWC DIVISION, KEYPORT**

**SPECIAL FACILITIES AND EQUIPMENT  
FACILITIES/EQUIPMENT CAPABILITY FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Facility/Equipment Nomenclature or Title	Hazardous Waste Treatment, Storage, and Disposal Facility

**1. State the primary purpose(s) of the facility/equipment.**

The primary purpose of this new state-of-the-art treatment, storage, and disposal facility is to store and treat hazardous waste from process operations at specialized Depot-Maintenance work sites at NUWC Division, Keyport and from off-site Naval facilities. This facility processes waste streams from over 500 unique depot-level operations at Keyport, and receives generated waste from numerous other naval activities. The Facility is operated and maintained by highly skilled technical personnel who have the necessary skills and expertise to support this state-of-the-art capability. This facility supports the MK 50 Torpedo program with the Navy's only permitted, long-term storage capability for lithium waste. It also provides fully compliant, permitted treatment and storage of Otto fuel waste from the MK 46 and MK 48 Torpedo programs.

**2. Indicate whether the facility/equipment is portable, moveable or fixed as defined by paragraph 6, 12 of this data call.**

This facility is fixed. The Treatment, Storage, and Disposal Facility (TSDF) is a 52,000 sq. ft. building consisting of specialized separate storage and process areas for acids, caustics, contaminated waste oil, flammables, combustibles, Lithium waste, oxidizers, reactives, and organic peroxides. This facility is totally enclosed with non-combustible and fire-rated construction throughout.

**3. Provide the replacement value of the facility/equipment. Report the facility/equipment cost separate from any building and utilities that may be integral to the facility/equipment.**

<u>Facility/Equipment</u>	<u>Replacement Value</u>
Treatment, Storage, and Disposal Facility	\$7,900K
Drum Crushers, Shredders, and Environmental Process Equipment	500K



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**4. Provide the gross weight and cube of the facility/equipment.**

<u>Facility/Equipment</u>	<u>Measure</u>
Treatment, Storage, and Disposal Facility	2,080,000 cu. ft.

**5. Indicate any "special" utility support required by this facility/equipment other than normal electrical power.**

Natural gas and emergency generator.

**6. Indicate any special budget requirements for the facility/equipment (i.e., special foundations, non-ferrous materials, shielding, hardening, etc.).**

This facility is constructed on a pile-driven concrete foundation, with non-combustible material throughout, water sealed in all areas, and special floor materials and coatings in each separate area of the building.

There are no additional special budget requirements for these facilities. A comprehensive review of future requirements has verified that these facilities have been sufficiently maintained/upgraded to ensure mission and compliance requirements are supported well into the future.

**7. State any environmental control requirements for the facility/equipment (i.e., temperature, humidity, air scrubbing).**

Mechanical ventilation in all areas, spill containment in all storage areas, special coatings on wall and floors, fire flow containment, emergency power, trench drains and sumps at all truck load areas, storm water retention ponds, tank leak detection and secondary containment, personnel decontamination facilities, automatic fire suppression, and spill/fire alarms throughout the facility.

**8. Indicate if this facility/equipment would be extremely difficult or impossible to replicate or relocate at another site and the impact to the Department of the Navy if this facility/equipment were lost. Consider existing Government-wide and commercial capabilities as the replication and impact statements are formulated.**

This facility will be the only Treatment, Storage, and Disposal Facility in the Navy permitted to accept Otto fuel waste and lithium boilers from off-site generators. It would be virtually impossible to attempt the permitting process at any other site due to ever-increasing restrictions by state and federal regulators. NUWC Division, Keyport has endeavored to



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relocate the Navy's (MK 50 Torpedo) lithium boilers to another permitted facility for the past 3 years and has found no other site capable of storing them within existing regulations. This includes government and commercial facilities throughout the U.S.

**9. Indicate how and when the facility/equipment was transported and or constructed at the site.**

The facility is currently under construction.

**10. List the functional support areas (previously provided in Tab A) that this facility/equipment support. Refer to Appendix A for the list of Functional support areas.**

This facility will primarily support the following Functional Support Areas:

- 2. Weapons Systems
  - 2.4 Torpedo Weapons Systems
  - 2.5 Mine Weapon Systems
  - 2.9 Fire Control
- 5. Sensors & Surveillance Systems
  - 5.1 Sonar Systems
- 8. Defense Systems
  - 8.2 Countermeasures
- 10. General Mission Support
  - 10.9 Activity Mission and Function Support

**11. Provide the historical utilization average for the past five fiscal years (1989-1993). Define the unit of measure used.**

The predecessor facility has averaged 2 million pounds of hazardous waste per year over the past 5 years.

**12. Provide the projected utilization data out to FY 1997.**

The projected utilization will be at least 1.7 million pounds per year through FY97.

**13. What is the approximate number of personnel used to operate the facility/equipment?**

Nine personnel are currently assigned to the operation.



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**14. What is the approximate number of personnel needed to maintain the equipment?**

Approximately two full-time personnel.

**15. Provide one 8 1/2 X 11 black and white photo of the facility/equipment.**

See attached photo.



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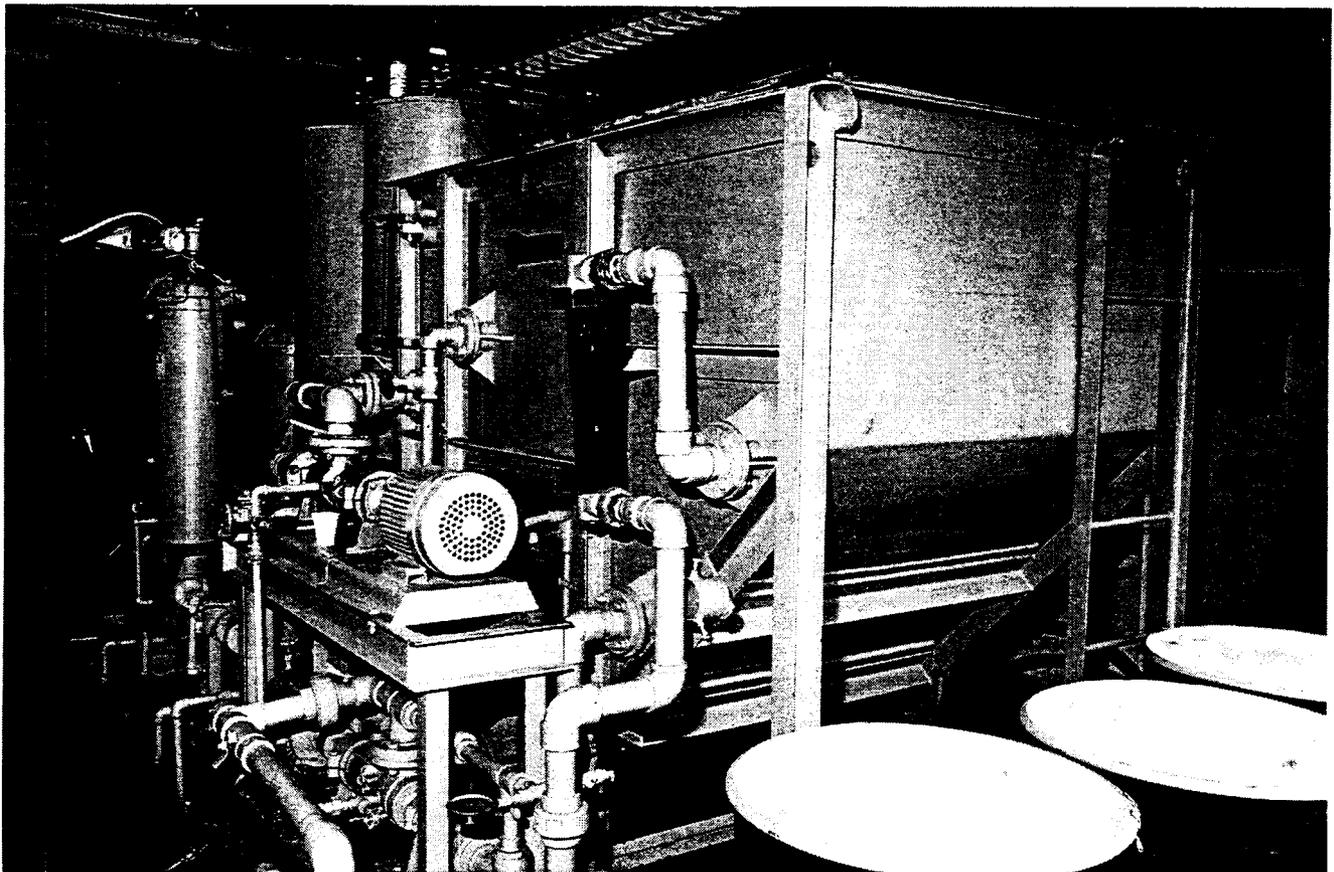
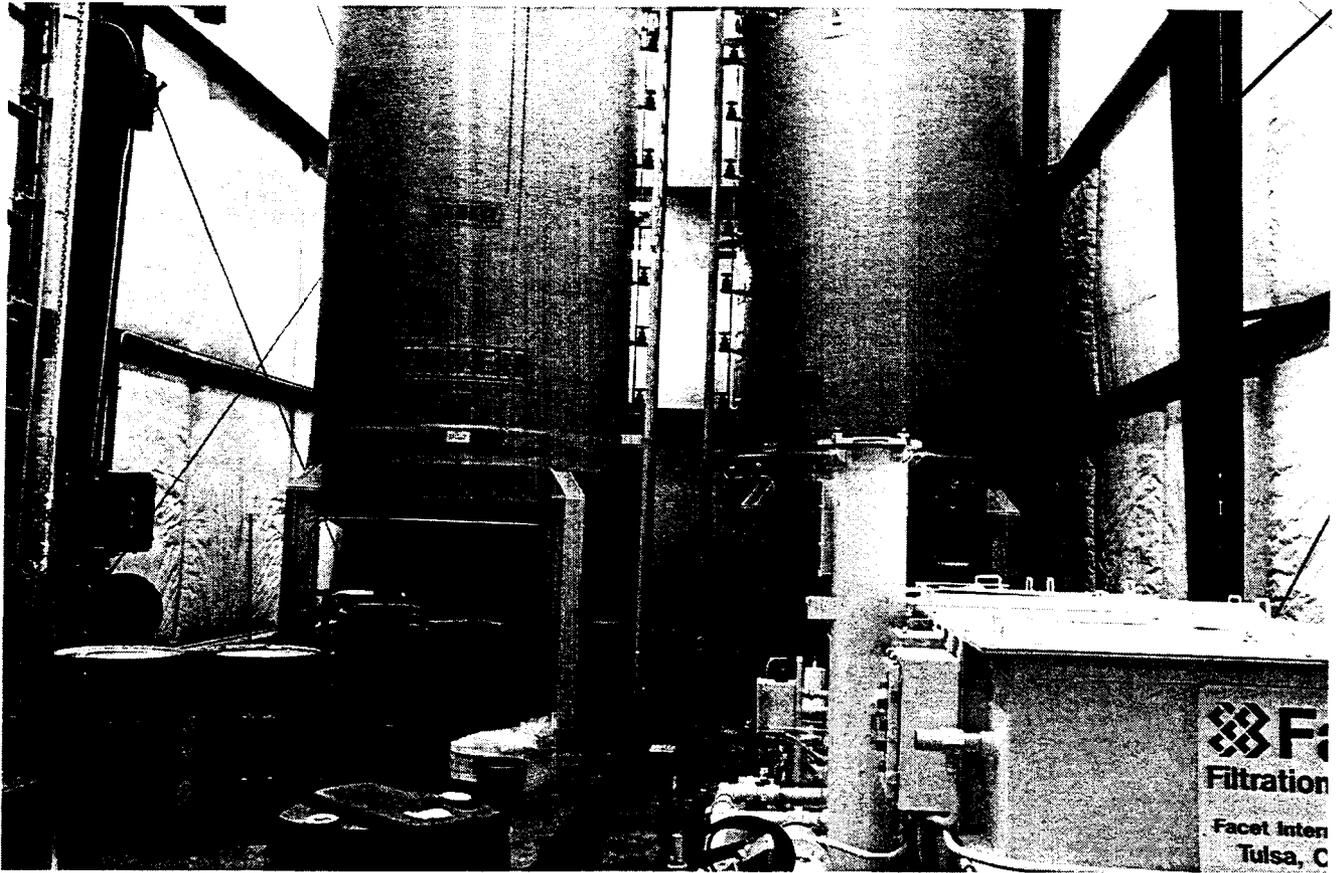
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NUWC DIV KEYPORT

**HAZARDOUS WASTE, TREATMENT, STORAGE, AND DISPOSAL**



**NUWC DIVISION, KEYPORT**

**SPECIAL FACILITIES AND EQUIPMENT  
FACILITIES/EQUIPMENT CAPABILITY FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Facility/Equipment Nomenclature or Title	Otto Fuel II Reclamation Plant

**1. State the primary purpose(s) of the facility/equipment.**

NUWC Division, Keyport's Otto Fuel II Reclamation Plant is unique in the world. Naval Sea Systems Command has identified this facility as having unique and essential capabilities in recent studies, and it is in direct support of the policy imperative to maintain organic capability to provide Fleet maintenance. This facility recovers torpedo monopropellant fuel from Depot, development laboratory, contractor, and Fleet IMA operational waste which otherwise would require disposal as hazardous chemical waste. The nitrogen-based fuel contains its own oxidizer for thermal reaction and is classified as a Group I Propellant (low fire hazard, non-explosive). Highly skilled operators are required, and the current operators average 11 years of applicable specialized experience. By avoiding new fuel procurement and waste disposal costs, the facility more than pays for itself each year.

In FY93, the plant recovered 351K pounds of "A" Condition fuel at a plant operating cost of \$390K. This fuel represented 47 percent of all torpedo "A" fuel used at Keyport. If the fuel recovered had been procured instead of recovered from waste, its new procurement value (at \$2.38 per pound) would have been \$835K -- **a savings of \$445K**. Without this facility that fuel would have required disposal as liquid hazardous waste (at \$3.20 per pound), an **additional cost of \$1,123K per year**. The **annual savings was \$1,568K**, a return-to-operations cost ratio of 4 to 1.

**2. Indicate whether the facility/equipment is portable, moveable or fixed as defined by paragraph 6, 12 of this data call.**

A major portion of the facility is fixed; a small portion is "moveable." The facility consists of two interconnected buildings; roofed, open air spaces with some protective walls; and one small, closed, utility/personnel building. The fixed portion includes concrete fuel handling areas (with spill containment berms) capable of supporting both large fuel trucks and large vertical and horizontal pad- or cradle-mounted fuel tanks. The pumps, piping, valves, and filters to accommodate fuel transfers between trucks, drums, transporters, and the processing/holding tanks are also considered fixed, as well as air pressure lines and the safety



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sprinkler system, since disassembly would require destruction of the system utility to recover only some useable parts. The eight foot high earthen berm surrounding the facility is fixed.

The fuel processing tanks, holding tanks, defueling stand, drum filler stand, and security fence are considered "moveable". Dismantling and movement of such heavy equipment (35 tons) would require an expense in the order of \$500K, since partial destruction of the facility (moderate wall and plumbing removal) would be required to gain access to and free-up the tanks.

**3. Provide the replacement value of the facility/equipment. Report the facility/equipment cost separate from any building and utilities that may be integral to the facility/equipment.**

The fixed building portion of the facility has a replacement value in excess of \$1M, not including land acquisition cost. The "moveable" portion has a value of approximately \$500K. The processing or drying tanks are specially modified for pressurized air injection.

**4. Provide the gross weight and cube of the facility/equipment.**

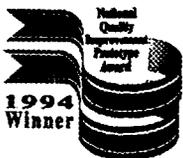
The reclamation facility requires an operational space inside the earthen berm of 0.5 acres minimum which resides inside an Explosive Safety Quantity Distance (ESQD) arc encompassing approximately 5 acres. The reclamation facility contains 9 tanks varying in size between 1,500 gallons and 5,800 gallons totaling 32,400 gallons capacity weighing in the neighborhood of 35 tons (empty), including fittings and mounting hardware. (Cradles and pads are not included).

**5. Indicate any "special" utility support required by this facility/equipment other than normal electrical power.**

The reclamation facility requires pressurized air at approximately 120 PSI at 140 SCFM for the drying tanks. All tanks need to be vented with air protection filters. A sprinkler system covering all bermed fuel handling areas and storage tanks is required.

**6. Indicate any special budget requirements for the facility/equipment (i.e., special foundations, non-ferrous materials, shielding, hardening, etc.).**

If the torpedo fuel reclamation plant were to be moved, then construction and installation budgets must provide for fixed foundations, pads, and cradles capable of supporting loaded fuel tanks and concrete operational areas with spill containment berms and epoxy covering to prevent fuel penetration or loss. The handling areas must also be capable of supporting heavy wheeled vehicles, such as loaded fuel trucks. Operational areas must be protected from rain,



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which will otherwise carry away spilled fuel; rain carry-off must, therefore, be provided. Various utilities, other than power, and personnel protection services must be provided as well.

**7. State any environmental control requirements for the facility/equipment (i.e., temperature, humidity, air scrubbing).**

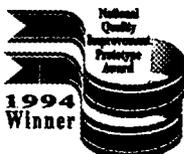
The Explosive Safety Quantity Distance arc for Group I propellants is required to provide a buffer zone around the facility which excludes other occupied structures. Environmental controls include rain carry-off as previously mentioned, filtered tank air vents, epoxy coated fuel handling areas to avoid spill penetration, and activated carbon filtering of waste water prior to transport to another industrial pretreatment facility.

**8. Indicate if this facility/equipment would be extremely difficult or impossible to replicate or relocate at another site and the impact to the Department of the Navy if this facility/equipment were lost. Consider existing Government-wide and commercial capabilities as the replication and impact statements are formulated.**

This Otto Fuel Reclamation Plant would be extremely difficult to relocate or replicate, since extensive fixed investment cost would be involved, as well as installation of heavy equipment and multiple utilities. The Navy torpedo community is the only customer. If the facility were lost, cost of new procurement torpedo fuel and cost of operations related to waste disposal would rise dramatically for the entire Navy torpedo program (in the order of 4-to-1 compared to the facility operating cost). The facility is unique in the world; there is no other that can take over the service/product provided without significant investment. Furthermore, it is presently located at the Navy's only torpedo repair depot (NUWC Division, Keyport), which uses more "A" Condition fuel than any other Navy entity. Most proofing and special operation tests conducted at Keyport require "A" fuel, and the warshot weapons delivered to the Fleet also require "A" fuel.

**9. Indicate how and when the facility/equipment was transported and or constructed at the site.**

The facility was initiated in 1980 (using old modified NAVOL (hydrogen peroxide) fuel tanks in a protected area) as a pilot project to demonstrate an economically viable method of reducing waste streams and recovering usable Otto fuel during the MK 48 Baseline Improvement Torpedo (BIT) program. It became a fully operational facility in 1982 as the concept was proven, and has been expanded over the years to now support the MK 48, MK 48 ADCAP and MK 46 Torpedo programs. Increasingly stringent EPA regulations have required facility investments as well the plant expansion for programs.



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**10. List the functional support areas (previously provided in Tab A) that this facility/equipment support. Refer to Appendix A for the list of Functional support areas.**

- 2. Weapons Systems
  - 2.4 Torpedoes

**11. Provide the historical utilization average for the past five fiscal years (1989-1993). Define the unit of measure used.**

Based on historical plant operating days per year, and projected volume changes based on Depot/Fleet torpedo operational tempo driving changes in plant operating days, the historical and projected utilizations are shown below:

**Otto Fuel II Reclamation Plant Utilization as  
Operating Days per Year versus Days per Year (Percent)**

Historical: 1989 - 90%; 1990 - 90%; 1991 - 89%; 1992 - 88%; 1993 - 86%.

**12. Provide the projected utilization data out to FY 1997.**

Projected: 1994 - 84%; 1995 - 88%; 1996 - 90%; 1997 - 92%.

(Bunkering and layup at NUWC Division, Keyport of MK 46 and MK 48 Torpedoes being removed from the Fleet as a result of Fleet downsizing will actually increase utilization in the outyears.)

**13. What is the approximate number of personnel used to operate the facility/equipment?**

Approximately 2.75 workyears are required to operate the plant including local fuel pickup, transport, and delivery.

**14. What is the approximate number of personnel needed to maintain the equipment?**

Periodic maintenance is estimated at approximately 0.25 workyears.

**15. Provide one 8 1/2 X 11 black and white photo of the facility/equipment.**



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OTTO FUEL II RECLAMATION PLANT

NUWC DIVISION, KEYPORT

**SPECIAL FACILITIES AND EQUIPMENT  
FACILITIES/EQUIPMENT CAPABILITY FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Facility/Equipment Nomenclature or Title	Lithium Decontamination Facility

**1. State the primary purpose(s) of the facility/equipment.**

This facility is used to teardown, sort, troubleshoot, and, if necessary, decontaminate hardware, including targets, torpedoes, or torpedo components. This includes classified and explosive-laden components and materials. Torpedoes such as MK 50, Submarine Launched Mobile Mine (SLMM), or special R&D test torpedoes or targets which have become contaminated with hazardous materials are environmentally cleaned. This includes MK 50 Torpedo components which are contaminated with lithium salts as a result of a boiler breach or a lithium battery failure. The hardware is repackaged and segregated into hazardous materials, wastes, and reusable components. Torpedo failure analysis and hardware inspection is also performed on contaminated hardware. The facility has the capability to safely decontaminate hardware using a series of cleaning and rinsing operations involving water, steam, detergents, and agents which neutralize the lithium salts. It is operated by highly skilled technical personnel who average over eight years of applicable specialized experience.

The Naval Sea Systems Command has identified the Lithium Boiler Decontamination facility as having unique and essential capabilities in recent studies, and it is in direct support of the policy imperative to maintain organic capability to provide Fleet maintenance.

**2. Indicate whether the facility/equipment is portable, moveable or fixed as defined by paragraph 6, 12 of this data call.**

Facility is fixed by virtue of environmental regulatory requirements.

**3. Provide the replacement value of the facility/equipment. Report the facility/equipment cost separate from any building and utilities that may be integral to the facility/equipment.**



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Replacement value of facility:

Building - \$500,000.  
Equipment - \$300,000.

**4. Provide the gross weight and cube of the facility/equipment.**

Equipment volume and gross weight - 2,844 cubic feet, 9,950 pounds.  
Facility volume - 57,920 cubic feet.

**5. Indicate any "special" utility support required by this facility/equipment other than normal electrical power.**

None.

**6. Indicate any special budget requirements for the facility/equipment (i.e., special foundations, non-ferrous materials, shielding, hardening, etc.).**

Ordnance ground.  
Contained hazardous waste transfer and storage system grated floor.  
Special fire walls.  
Process tanks.

There are no additional special budget requirements for these facilities. A comprehensive review of future requirements has verified that these facilities have been sufficiently maintained/upgraded to ensure mission and compliance requirements are supported well into the future.

**7. State any environmental control requirements for the facility/equipment (i.e., temperature, humidity, air scrubbing).**

Breathing air supply.  
Flexible duct ventilation system.  
Ventilation system for control of toxic air.  
Contained hazardous waste transfer and storage system.



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**8. Indicate if this facility/equipment would be extremely difficult or impossible to replicate or relocate at another site and the impact to the Department of the Navy if this facility/equipment were lost. Consider existing Government-wide and commercial capabilities as the replication and impact statements are formulated.**

Relocation of the facility to areas other than the MK 50 Depot IMA would be impossible. NUWC Division, Keyport is the only MK 50 Torpedo Depot and IMA in the U.S. Navy; hence, Keyport is the generator of the lithium-contaminated wastes in this process and is responsible for its decontamination. The decontamination of hazardous waste, explosive laden components (such as breached MK 50 Torpedoes), is fully permitted and in compliance with regulatory requirements.

Integration of the decontamination facility with the MK 50 Depot allows the mechanics and engineering staffs of various product lines (MK 50, SLMM, etc.) to utilize the facility for decontamination, thereby sharing costs. This requires extensive knowledge of troubleshooting and failure analysis of torpedo components. Currently, the facility utilizes the in-depth knowledge base within the Depot to support this function. All persons involved are required to be explosive certified.

**9. Indicate how and when the facility/equipment was transported and or constructed at the site.**

The facility was completed during the fall of 1991 by modifying an existing building.

**10. List the functional support areas (previously provided in Tab A) that this facility/equipment support. Refer to Appendix A for the list of Functional support areas.**

Functional support areas:

- 2. Weapons Systems
  - 2.4 Torpedoes
  - 2.5 Mines

**11. Provide the historical utilization average for the past five fiscal years (1989-1993). Define the unit of measure used.**

The facility has been used an average 40 workdays per year since the Fall of 1991.



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**12. Provide the projected utilization data out to FY 1997.**

It is estimated that the facility will be used 40 workdays a year out to FY 1997.

**13. What is the approximate number of personnel used to operate the facility/equipment?**

Three personnel work in the facility when the facility is being used.

**14. What is the approximate number of personnel needed to maintain the equipment?**

It requires less than .1 workyears of effort to maintain the facility.

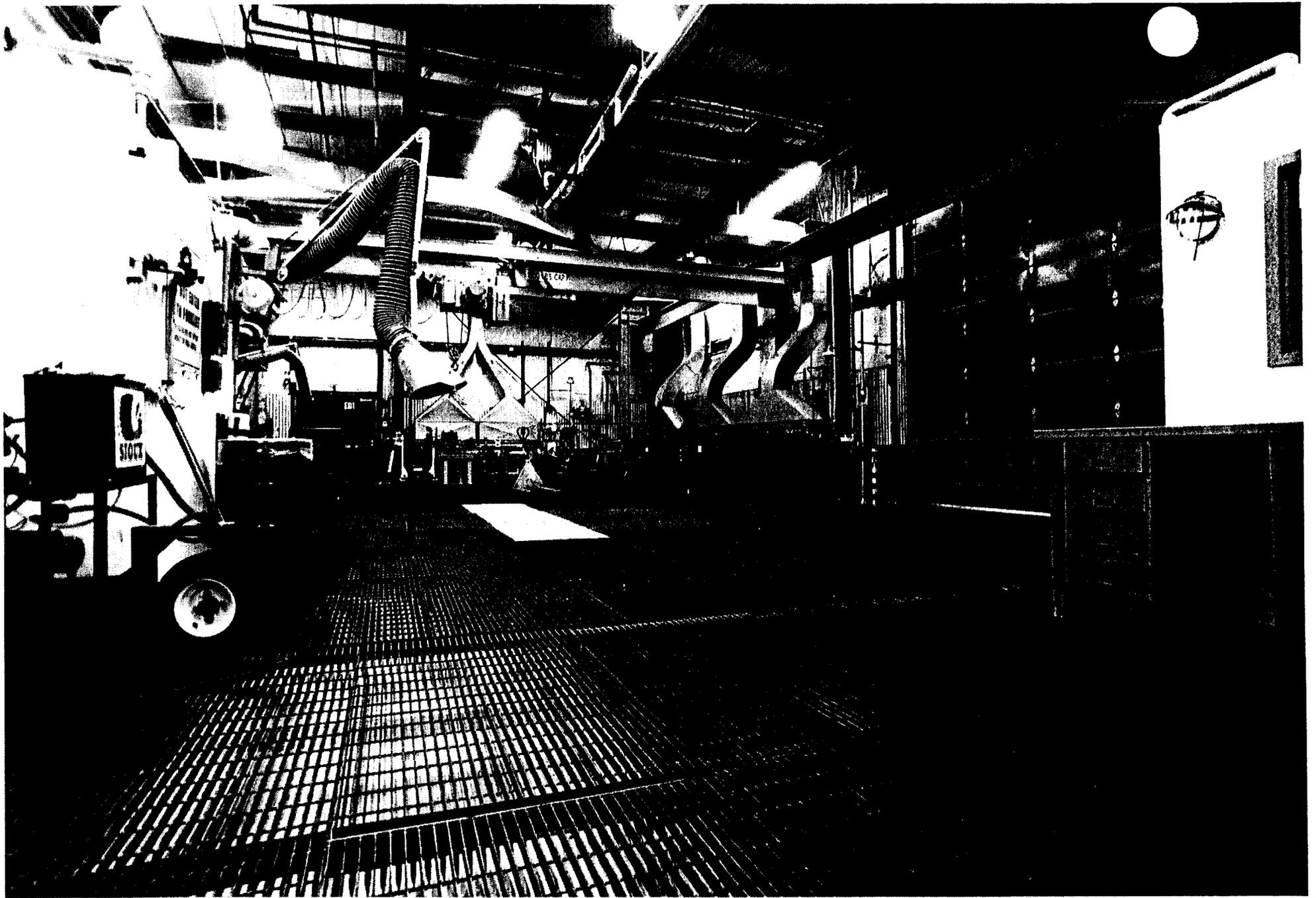
**15. Provide one 8 1/2 X 11 black and white photo of the facility/equipment.**

See attached photo.



**ADMINISTRATIVE SENSITIVE**

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**LITHIUM DECONTAMINATION FACILITY**

**NUWC DIVISION, KEYPORT**

**SPECIAL FACILITIES AND EQUIPMENT  
FACILITIES/EQUIPMENT CAPABILITY FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Facility/Equipment Nomenclature or Title	Recycling Facility

**1. State the primary purpose(s) of the facility/equipment.**

The Recycling Facility performs a variety of Disposal, Reutilization and Recycling Functions. The facility supports efforts in processing "A" condition material for return to the Supply System; processing reusable materials that are excess to a customer's needs and shipping them to the Defense Reutilization Service (DRMO-Fort Lewis); processing reusable hazardous material; demilitarization of classified material; and processing recyclable material. It is operated by skilled technical personnel who have an average of over 12 years of applicable specialized experience. Functions performed at this facility made a major contribution in NUWC Division, Keyport's winning the Navy's "Pollution Prevention and Team Recycling Award" in 1994 and the "Kitsap County Special Recognition in Waste Reduction Award" in 1992. Articles featuring our recycling efforts have appeared in "All Hands" and the "Minimizer."

**2. Indicate whether the facility/equipment is portable, moveable or fixed as defined by paragraph 6, 12 of this data call.**

This entire facility and 90 percent of the related equipment is fixed.

**3. Provide the replacement value of the facility/equipment. Report the facility/equipment cost separate from any building and utilities that may be integral to the facility/equipment.**

Equipment is as follows: SSI Demil Shredder and feed conveyor - \$90K; Vertical Baler, container dumper, paper sorting conveyor - \$60K; Hog-fuel line - \$150K; 4,800 sq. ft. frame/fabric structure with berms - \$140K. Total equipment replacement cost including installation - \$430K.

Facilities data: Replacement value of Building 1018, building, structures, and related paving and fence is \$310K. Total replacement cost of facility and equipment is \$750K.



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**4. Provide the gross weight and cube of the facility/equipment.**

Weight of this facility's equipment is 26,550 pounds; it occupies 1,100 cubic feet. The entire facility encompasses 40,000 square feet.

**5. Indicate any "special" utility support required by this facility/equipment other than normal electrical power.**

The facility's equipment requires 450 volt, 3-phase power. Interior berms in the receiving structure and the hazardous materials processing area must be bermed to prevent spread of hazardous materials.

**6. Indicate any special budget requirements for the facility/equipment (i.e., special foundations, non-ferrous materials, shielding, hardening, etc.).**

There are no additional special budget requirements for these facilities. A comprehensive review of future requirements has verified that these facilities have been sufficiently maintained/upgraded to ensure mission and compliance requirements are supported well into the future.

**7. State any environmental control requirements for the facility/equipment (i.e., temperature, humidity, air scrubbing).**

There are no special environmental requirements other than the hazardous materials spill containment berms identified previously.

**8. Indicate if this facility/equipment would be extremely difficult or impossible to replicate or relocate at another site and the impact to the Department of the Navy if this facility/equipment were lost. Consider existing Government-wide and commercial capabilities as the replication and impact statements are formulated.**

The facility would be extremely difficult to replicate or relocate. The facility and related equipment is essential to meeting mission-related and environmentally regulated (mandated) requirements for disposing of material. The close proximity of this facility to the industrial area minimizes the costs of operation. Relocating the facility at any distance from the industrial area will greatly increase its cost of operation due to the logistics involved. By remaining on the base, we can use existing logistics support to the fullest extent. This permits a small work force (three employees) to receive, process, and ship over 350 pallets of material a month. This effective integration of similar functions may well be the most efficient in the Navy.



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**9. Indicate how and when the facility/equipment was transported and or constructed at the site.**

The primary facility was constructed in 1987. The paper processing line was installed from 1989-1991. Both the 4,800 square foot frame/fabric structure and the Hog-fuel line are currently under construction.

**10. List the functional support areas (previously provided in Tab A) that this facility/equipment support. Refer to Appendix A for the list of Functional support areas.**

- 2. Weapons Systems
  - 2.4 Torpedoes
  - 2.5 Mines
- 5. Sensors & Surveillance Systems
  - 5.1 Sonar Systems
- 8. Defense Systems
  - 8.2 Countermeasures
- 10. General Mission Support
  - 10.3 Facilities Engineering
  - 10.4 Diving, Salvage and Ocean Engineering
  - 10.9 Activity Mission and Function Support

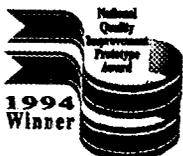
**11. Provide the historical utilization average for the past five fiscal years (1989-1993). Define the unit of measure used.**

A general measure of activity for this group is a pallet of material received, processed, and shipped. Keep in mind that a pallet may consist of many line items of material. Those line items of material may be hazardous or ADP or recyclables, all which require special handling and/or documentation. The historical average for the preceding five fiscal years has been 263 pallets per month.

**12. Provide the projected utilization data out to FY 1997.**

The projected utilization data from 1994 through 1997 per month is:

1994 - 370; 1995 - 390; 1996 - 325; 1997 - 300 (values are pallets per month).



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**13. What is the approximate number of personnel used to operate the facility/equipment?**

Currently, three personnel operate this facility.

**14. What is the approximate number of personnel needed to maintain the equipment?**

Periodic equipment maintenance requires approximately a 0.25 workyear level of effort. Routine maintenance is provided by the operators with a maximum of 100 workhours annually required.

**15. Provide one 8 1/2 X 11 black and white photo of the facility/equipment.**

See attached photo.



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RECYCLING FACILITY

NUWC DIVISION, KEYPORT

**SPECIAL FACILITIES AND EQUIPMENT  
FACILITIES/EQUIPMENT CAPABILITY FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Facility/Equipment Nomenclature or Title	Hyperbaric Chamber

**1. State the primary purpose(s) of the facility/equipment.**

The Hyperbaric Chamber is a unique facility that is essential to all government diving operations in the Pacific Northwest, since it is the DoD's only recompression chamber in the area. The skilled personnel who operate this chamber have an average of over 11 years of diving experience. The chamber provides:

- (a) Chamber support for all DoD diving operations.
- (b) Emergency recompression treatment for diving related injuries.
- (c) Hyperbaric therapy for non-diving related medical problems and treating gaseous gangrene.
- (d) Diving candidate pressure testing for all branches of the armed forces and Department of Defense personnel.
- (e) Emergency humanitarian treatments.
- (f) Aviator recompression.

**2. Indicate whether the facility/equipment is portable, moveable or fixed as defined by paragraph 6, 12 of this data call.**

The chamber is movable at considerable expense, as are the high pressure and low pressure air and oxygen systems.



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**3. Provide the replacement value of the facility/equipment. Report the facility/equipment cost separate from any building and utilities that may be integral to the facility/equipment.**

The replacement value is \$750K for the recompression chamber and supporting air and oxygen systems. This size of chamber is no longer available and would require special design and manufacturing. Design must allow adequate space allocation for the number of personnel required to be present during treatments (i.e., patient, Doctor, and technicians).

**4. Provide the gross weight and cube of the facility/equipment.**

Weight: 8 tons.  
Volume: 400 cu. ft.

**5. Indicate any "special" utility support required by this facility/equipment other than normal electrical power.**

(a) Long distance telephone service into chamber to communicate with medical authorities.

(b) Oxygen system piped into recompression chamber

**6. Indicate any special budget requirements for the facility/equipment (i.e., special foundations, non-ferrous materials, shielding, hardening, etc.).**

Class P-1 piping for High Pressure Air in excess of 3 psi. Special Oxygen clean valves and regulators in accordance with Diving Air Purity Standards. There are no additional special budget requirements for these facilities. A comprehensive review of future requirements has verified that these facilities have been sufficiently maintained/upgraded to ensure mission and compliance requirements are supported well into the future.

**7. State any environmental control requirements for the facility/equipment (i.e., temperature, humidity, air scrubbing).**

(a) Gas analysis of internal chamber environment during chamber use.

(b) High pressure air filters changed annually.

(c) Temperature control in and out of the recompression chamber.

(d) Medical facilities, including diving or submarine trained doctors.



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**8. Indicate if this facility/equipment would be extremely difficult or impossible to replicate or relocate at another site and the impact to the Department of the Navy if this facility/equipment were lost. Consider existing Government-wide and commercial capabilities as the replication and impact statements are formulated.**

Relocation: The large size and intricacy of support system flasks and piping render this system extremely difficult to relocate or replicate.

Impact: A chamber is required in the immediate area to meet the regulatory requirements for conducting safe diving operations. The loss of this facility would require the cessation all military and government employee (PSNS) diving in the Pacific Northwest.

**9. Indicate how and when the facility/equipment was transported and or constructed at the site.**

The equipment was installed circa 1940.

**10. List the functional support areas (previously provided in Tab A) that this facility/equipment support. Refer to Appendix A for the list of Functional support areas.**

- 10. General Mission Support
  - 10.4 Diving, Salvage, and Ocean Engineering
  - 10.7 Major Range Development and Operations
  - 10.9 Activity Mission and Function Support

**11. Provide the historical utilization average for the past five fiscal years (1989-1993). Define the unit of measure used.**

Recompression chamber utilization by category (five year totals):

- (a) Serious decompression or arterial gas embolism treatments: 50.
- (b) Pain-only decompression: 10.
- (c) Training: 184.
- (d) Oxygen therapies/osteomyelitides: 204.
- (e) Special Warfare, EOD, and diver candidate testing: 235.
- (f) Local Community Humanitarian Treatments: 55.
- (g) Work up pressurization for deep dives: 52.

Total chamber operations: 790. (Average 40 chamber operations per year.)



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**12. Provide the projected utilization data out to FY 1997.**

Projected utilization is 40 chamber operations per year.

**13. What is the approximate number of personnel used to operate the facility/equipment?**

Operating personnel: Eight qualified divers.

**14. What is the approximate number of personnel needed to maintain the equipment?**

Less than 0.1 workyears.

**15. Provide one 8 1/2 X 11 black and white photo of the facility/equipment.**

See attached photo.



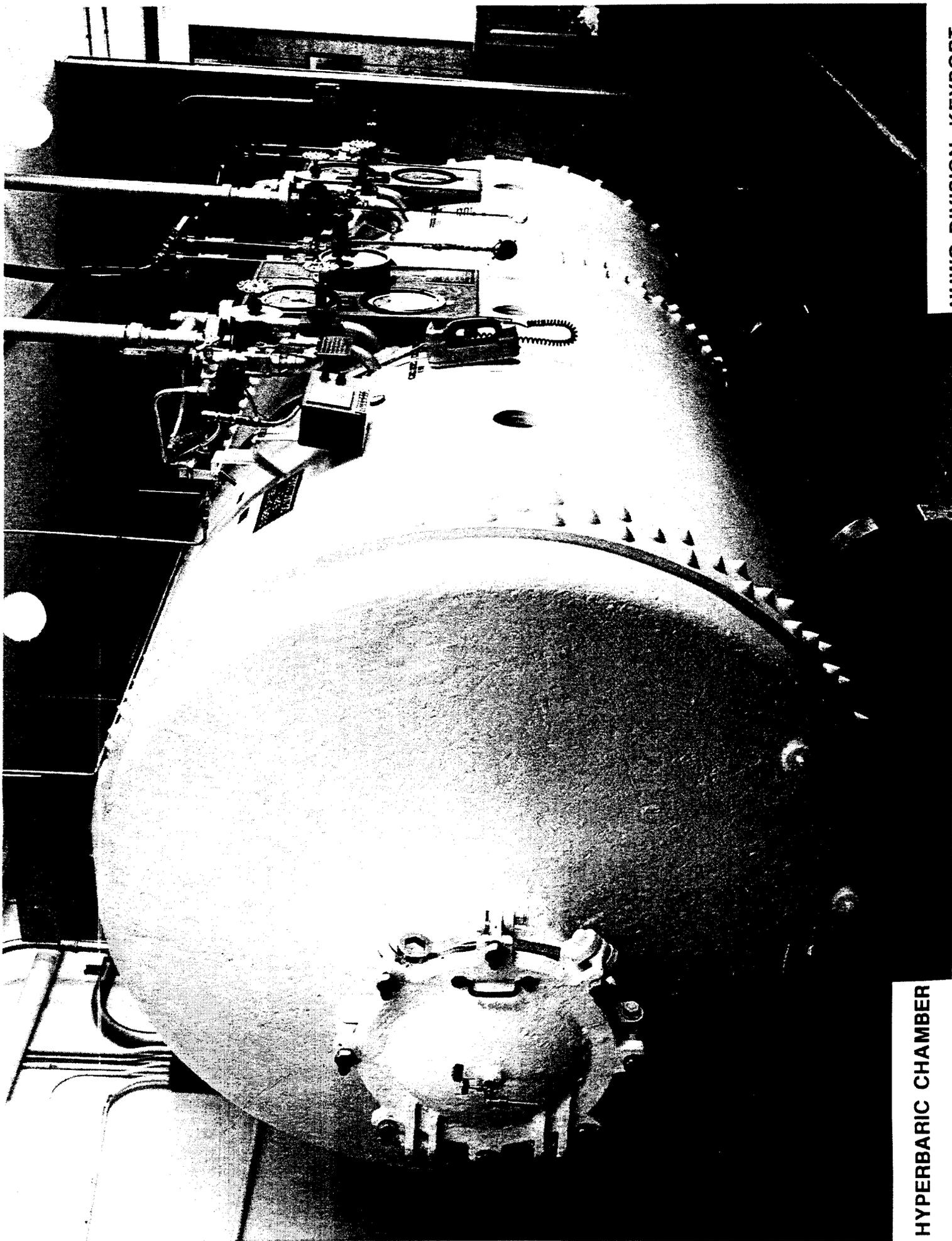
**ADMINISTRATIVE SENSITIVE**

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**HYPERBARIC CHAMBER**

SPECIAL FACILITIES AND EQUIPMENT  
FACILITIES/EQUIPMENT CAPABILITY FORM

Technical Center Site	NUWC Division, Keyport Keyport, WA
Facility/Equipment Nomenclature or Title	Automated Material Handling Facility

**1. State the primary purpose(s) of the facility/equipment.**

The Automated Material Handling Facility provides automated storage and retrieval of production hardware in support of MK 46, MK 48/ADCAP, MK 50 and Combat Weapons Systems programs. The facility by design provides state-of-the-art material handling technology. The primary system consists of four aisles of unit load and two aisles of mini-load storage racks serviced by high speed storage and retrieval (SR) cranes driven by a centralized, dedicated VAX based computer system that interfaces with other Division material management systems. The system is capable of handling 15 material picks per hour in the unit load section and 45 material picks per hour in the mini-load section. It is estimated that this facility will enhance material logistics productivity by 30% in the first year of operation, increasing up to 50% in the second year of operation. In addition, the facility will free up over 12,300 square feet of floor space in adjacent production areas and reduce reliance on leased storage space by a minimum of 70,000 square feet with an annual cost avoidance of \$500,000 per annum. This facility is a major MILCON that is nearing completion. By allowing this MILCON project to proceed in a very restrictive MILCON environment, the Navy and Congress confirmed the importance of this facility. This state-of-the-art facility will be staffed by highly skilled personnel with approximately 11 years of applicable specialized experience in material storage and inventory control.

**2. Indicate whether the facility/equipment is portable, moveable or fixed as defined by paragraph 6, 12 of this data call.**

The building and storage and retrieval machines for the unit load/mini-load areas are fixed.

**3. Provide the replacement value of the facility/equipment. Report the facility/equipment cost separate from any building and utilities that may be integral to the facility/equipment.**

Facility - \$9M  
Equipment - \$4.05M



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**4. Provide the gross weight and cube of the facility/equipment.**

Total Weight of Facility - 15K tons.

Total Cubic Feet - 1.281M.

**Facility Cubic Feet Breakdown:**

Unit Load - 696,000

Mini-Load - 218,400

Staging Area - 357,000

Computer/Office - 10,000

**5. Indicate any "special" utility support required by this facility/equipment other than normal electrical power.**

Extensive data communications network, sprinkler, and alarm systems.

**6. Indicate any special budget requirements for the facility/equipment (i.e., special foundations, non-ferrous materials, shielding, hardening, etc.).**

There are no additional special budget requirements for these facilities. A comprehensive review of future requirements has verified that these facilities have been sufficiently maintained/upgraded to ensure mission and compliance requirements are supported well into the future.

**7. State any environmental control requirements for the facility/equipment (i.e., temperature, humidity, air scrubbing).**

Automated Material Handling Facility storage racks and staging areas are temperature controlled. Office/computer room is temperature and humidity controlled. Unit Load Aisle 6 was built to contain potential torpedo fuel spills. Ventilation is required for the battery-charging area.

**8. Indicate if this facility/equipment would be extremely difficult or impossible to replicate or relocate at another site and the impact to the Department of the Navy if this facility/equipment were lost. Consider existing Government-wide and commercial capabilities as the replication and impact statements are formulated.**

It would be extremely difficult and costly to relocate this facility. If the facility/equipment were lost, the impact would be severe as a significant portion of the logistical support storage facilities for the United States Navy's torpedo programs would be eliminated.



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**9. Indicate how and when the facility/equipment was transported and or constructed at the site.**

Construction commenced in 1993. Equipment was transported from vendors by commercial truck and assembled on site.

**10. List the functional support areas (previously provided in Tab A) that this facility/equipment support. Refer to Appendix A for the list of Functional support areas.**

- 2. Weapons Systems
  - 2.4 Torpedoes
  - 2.5 Mines

**11. Provide the historical utilization average for the past five fiscal years (1989-1993). Define the unit of measure used.**

n/a - New construction.

**12. Provide the projected utilization data out to FY 1997.**

100% - Scheduled Production Time.

**13. What is the approximate number of personnel used to operate the facility/equipment?**

Thirteen personnel will be used to operate the facility.

**14. What is the approximate number of personnel needed to maintain the equipment?**

Two personnel are needed to maintain the equipment.

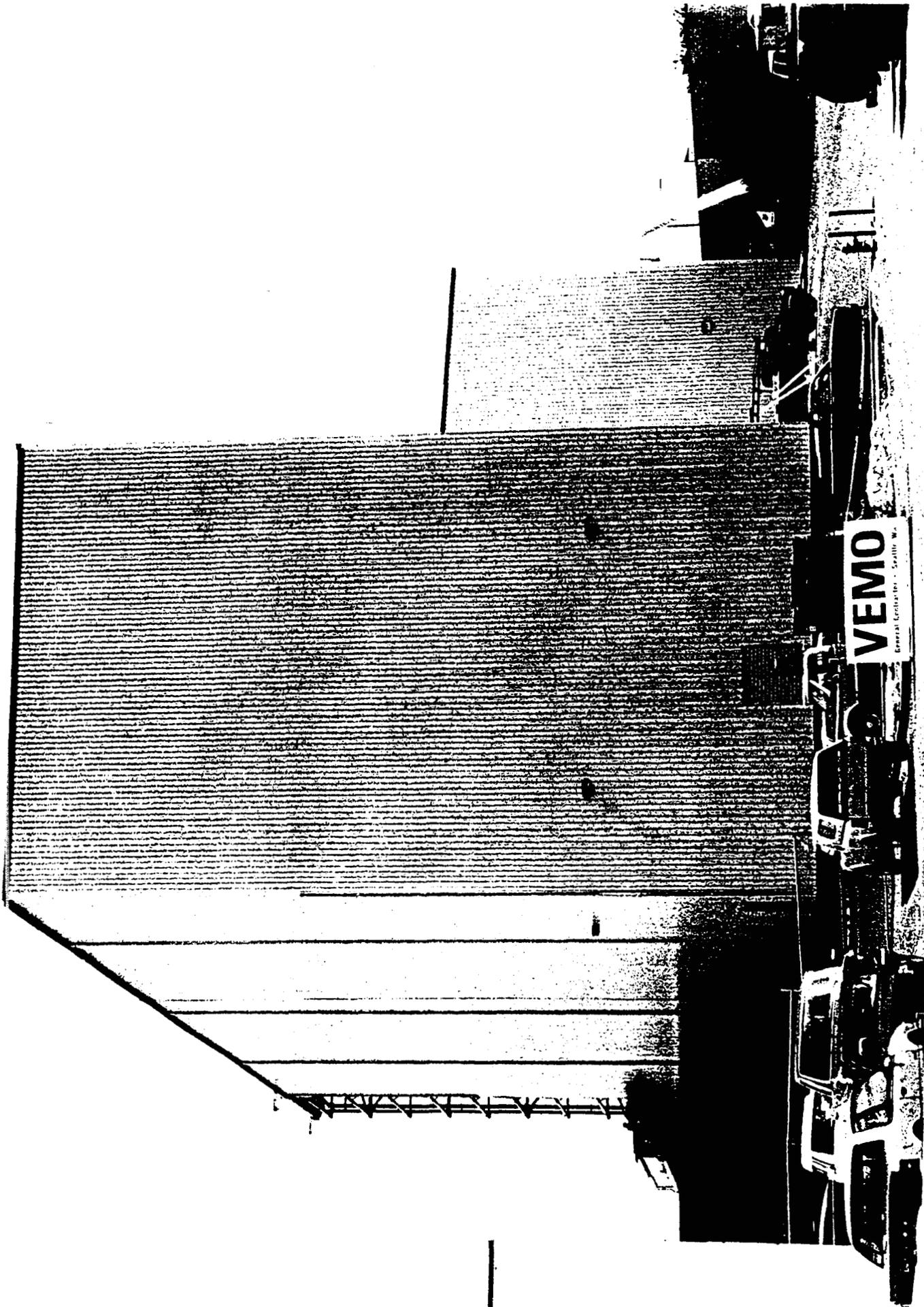
**15. Provide one 8 1/2 X 11 black and white photo of the facility/equipment.**

See attached photo.



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**SPECIAL FACILITIES AND EQUIPMENT  
FACILITIES/EQUIPMENT CAPABILITY FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Facility/Equipment Nomenclature or Title	Naval Undersea Museum

**1. State the primary purpose(s) of the facility/equipment.**

The Naval Undersea Museum is the Navy's official undersea museum. It is the premier source of undersea science and technology exhibits in the United States. The Naval Undersea Museum's mission is both unique and distinctive. Within the U.S. Navy, the Naval Undersea Museum is the only facility specifically tasked with the preservation and interpretation of naval undersea history and technology. No other institution has this mission or capability. The Museum is rapidly acquiring a national reputation for the excellence of its collections and facilities. The primary purpose of the Museum, as defined by SECNAVINST 5430 of 22 June 1987, is as follows:

*"To collect, preserve, catalog, display, and describe undersea phenomena, undersea naval weapons, sensors and platforms at the subsystem, equipment, and component level that are representative of the innovation, development, growth, and historic heritage of these weapons, sensors, and platforms in exploiting undersea phenomena."*

To accomplish its mission, the Naval Undersea Museum collects, preserves, studies, interprets, and utilizes tangible objects and documents in programs of exhibition and education.

The Naval Undersea Museum was built with over \$10 million dollars of private and public funds donated to the Naval Undersea Museum Foundation, which is chartered to raise funds for the construction and outfitting of the museum. The State of Washington and Kitsap County donated funds to help complete the museum with the expectation that it would become a permanent asset for the community and the general public. The Naval Undersea Museum has strong support from the community for its science education workshops. Over 17,000 students from Washington and their teachers participated in separate, live satellite downlinks of scientific explorations from the Sea of Cortez in the 1993 Jason IV expedition and from the coral reefs and rain forests of Belize in the 1994 Jason V field study. The museum hosts active-duty military, civilian, veterans, retiree groups, foreign dignitaries, and civic organizations who advocate furthering the understanding of the Navy's critical role in



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undersea exploration and technological evolution of systems which now benefit commercial, archeological, and peace-time applications.

The United States Navy owns, maintains, and operates the Naval Undersea Museum, which is located on the Naval Undersea Warfare Center Division, Keyport property and within the Division's perimeter fence. The Naval Undersea Museum is accessible to the general public and provides an opportunity for United States citizens and foreign visitors to appreciate the high calibre and dedication of the men and women who advanced knowledge of undersea systems technology in the past. The museum is staffed by highly skilled professional and administrative personnel with a combined total of over 125 years of applicable specialized experience. In addition, numerous volunteers provide essential support for museum operations.

**2. Indicate whether the facility/equipment is portable, moveable or fixed as defined by paragraph 6, 12 of this data call.**

The Naval Undersea Museum is considered to be a fixed facility. The contents of the Museum, i.e., its collections, are portable.

**3. Provide the replacement value of the facility/equipment. Report the facility/equipment cost separate from any building and utilities that may be integral to the facility/equipment.**

Replacement value of building, including auditorium: \$7,000,000.  
Replacement value of exhibits and interior furnishings: \$3,000,000.  
Replacement value of collections (estimated\*): \$13,300,000.

\*The value of the collections cannot be precisely determined, since they have been donated, not purchased; therefore, a monetary value is not readily assignable. However, the replacement value of the artifacts, if replacements could be found and purchased (and in many cases this is impossible), is estimated at \$13,300,000.

**4. Provide the gross weight and cube of the facility/equipment.**

The Museum occupies 68,000 square feet and has a cube of approximately 1,360,000 cubic feet. The gross weight of the facility and its collections is not readily determinable.

**5. Indicate any "special" utility support required by this facility/equipment other than normal electrical power.**

n/a



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**6. Indicate any special budget requirements for the facility/equipment (i.e., special foundations, non-ferrous materials, shielding, hardening, etc.).**

n/a

**7. State any environmental control requirements for the facility/equipment (i.e., temperature, humidity, air scrubbing).**

The Naval Undersea Museum heating, air and ventilation system was designed to maintain the optimum temperature range for museum artifacts of 55 to 70 degrees Fahrenheit and the optimum humidity range of 50 to 60 percent. The Exhibit Hall was specifically designed to protect artifacts and collections from ultraviolet radiation damage.

**8. Indicate if this facility/equipment would be extremely difficult or impossible to replicate or relocate at another site and the impact to the Department of the Navy if this facility/equipment were lost. Consider existing Government-wide and commercial capabilities as the replication and impact statements are formulated.**

The Naval Undersea Museum would be virtually impossible to replicate or relocate at another site. The fund-raising program leading to the Museum's construction took over ten years. The project drew extensively upon financial contributions from a wide variety of private sources as well as financial support from local, state, and federal governments. SECNAVINST 5755.1A requires that all museum construction, excluding the Navy Museum in Washington, D.C., be funded completely through private means. It is not realistic to expect that the funding coalition that was drawn together to produce this facility could be reassembled or replicated and induced to construct a similar facility at another location.

Additionally, because of 1) the specific requirements needed for public exhibition and artifact storage and 2) the square footage required to store and exhibit the Museum's collections, it is extremely unlikely that an equivalent, suitable location or facility for the Museum could be found anywhere else in the country. Not only does the Museum's mission differ radically from that of any other Navy or private museum, there is not another museum within the Navy system with the space to accommodate either the Naval Undersea Museum's collections or its exhibitions.

Because of the mission assigned to the Museum by the Secretary of the Navy, its function is inherently governmental. The Museum's focus on naval undersea history and technology limits the support and sponsorship of this capability to the U.S. Government. While there are governmental naval museums and private maritime museums, no other museum exists which has the focus or affinity for naval underwater weapons and technology that this Museum does. The Museum's function is not supported by, or already resident in, industry. Museums



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inherently do not attempt to produce a profit. Industry has no economic incentive to operate an institution which serves only historical and interpretive functions.

The impact of the loss of this facility would be significant. The rich collection of naval undersea artifacts, which is particularly strong in torpedoes and mines, exists nowhere else in the world. The rarity of many items in the collection makes it unlikely that any other institution could assemble a collection of similar breadth and depth. The Museum possesses, among other resources, the Navy's best and most extensive collection of torpedoes. It also possesses significant collections of artifacts representing undersea weapons and technology. Loss or dispersal of this collection would deprive the Navy of its ability to maintain and exhibit the very fabric of its history. Perhaps more importantly, it would also eliminate the Navy's capability to collect, preserve, and interpret emerging aspects of its undersea history.

The Naval Undersea Museum represents the sum of the Navy's corporate memory in underwater history, exploration, development, and technology. No other single institution brings together the same effective combination of collections, services, facilities, and historical experience. The Naval Undersea Museum provides the Fleet and the shore establishment with accessibility to its history; it also ensures the continuous documentation and preservation of naval undersea history for the benefit of future generations of Navy men and women.

The Museum also provides the Navy with significant value in presenting naval heritage and accomplishments to the general public. It is one of only two major naval museums on the West Coast. The Museum fosters the role of the Navy in maintaining the peace and defending the nation in war.

Potential donors would take the disestablishment of the Museum as a signal by the Navy that the Navy placed no value on its history. There would therefore be no incentive for people to donate items of historic importance to the Navy, nor would there be a facility capable of receiving, managing, and exhibiting them

The Museum also possesses significant archival resources directly related to undersea history and technology. Loss of this resource would degrade preservation of undersea history as well as eliminate the capability to collect and make this material available to the Navy and the general public in the future.

**9. Indicate how and when the facility/equipment was transported and or constructed at the site.**

The Naval Undersea Museum was established by the Secretary of the Navy on 23 July 1979. The Naval Undersea Museum Foundation was chartered in 1980 to raise funds for the construction and outfitting of a museum facility that was, upon completion, to be turned over



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to the Navy to operate and maintain. Memoranda of Understanding between the Navy and the Naval Undersea Museum Foundation signed in 1985 and 1990 define the host-support relationship between the two organizations.

Groundbreaking for the Museum took place in July 1985. The core structure and the exhibit hall were completed in October 1989 and officially turned over to the Navy on 15 December 1989. The storage area and parking lot were transferred in April 1990; these facilities were incomplete and the Foundation obligated itself to finish them when sufficient funding became available. The Museum's Preview Center opened in 1991, and its first permanent exhibits opened in July 1993. The Murdock Auditorium, a 450 seat facility, was completed in 1992 and officially transferred to the Navy on 28 April 1994.

**10. List the functional support areas (previously provided in Tab A) that this facility/equipment support. Refer to Appendix A for the list of Functional support areas.**

- 10. General Mission Support
  - 10.9 Activity Mission and Function Support

**11. Provide the historical utilization average for the past five fiscal years (1989-1993). Define the unit of measure used.**

Utilization of the Museum is measured in the number of visitors the Museum receives annually. The unit of measure used is individual visitor count as made daily in the Museum.

Annual visitation figures for each fiscal year since the Museum opened are set forth below. It should be noted that the Museum's Preview Center was not open to the public until 1991, and the first increment of permanent exhibits was not opened to the public until July 1993.

FY89	0	Museum not open.
FY90	1,449	Museum not open.
FY91	1,535	Museum not open.
FY92	10,094	Preview Center opens.
FY93	40,681	First increment of permanent exhibits opens.

**12. Provide the projected utilization data out to FY 1997.**

FY 94 - 50,000 (estimated).  
FY 95 - 60,000 (estimated).  
FY 96 - 70,000 (estimated).  
FY 97 - 80,000 (estimated).



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**13. What is the approximate number of personnel used to operate the facility/equipment?**

This includes 6 professional staff, 2 administrative positions, and two custodial personnel. It also includes the volunteer support rendered to the Museum in 1993 by over 100 volunteers. In calendar 1993, volunteers contributed almost 15,000 hours of effort to the Museum, the equivalent of 8.86 full-time equivalent. The Museum could not operate without the support of its volunteer staff.

**14. What is the approximate number of personnel needed to maintain the equipment?**

The Museum requires two custodial staff members for maintenance.

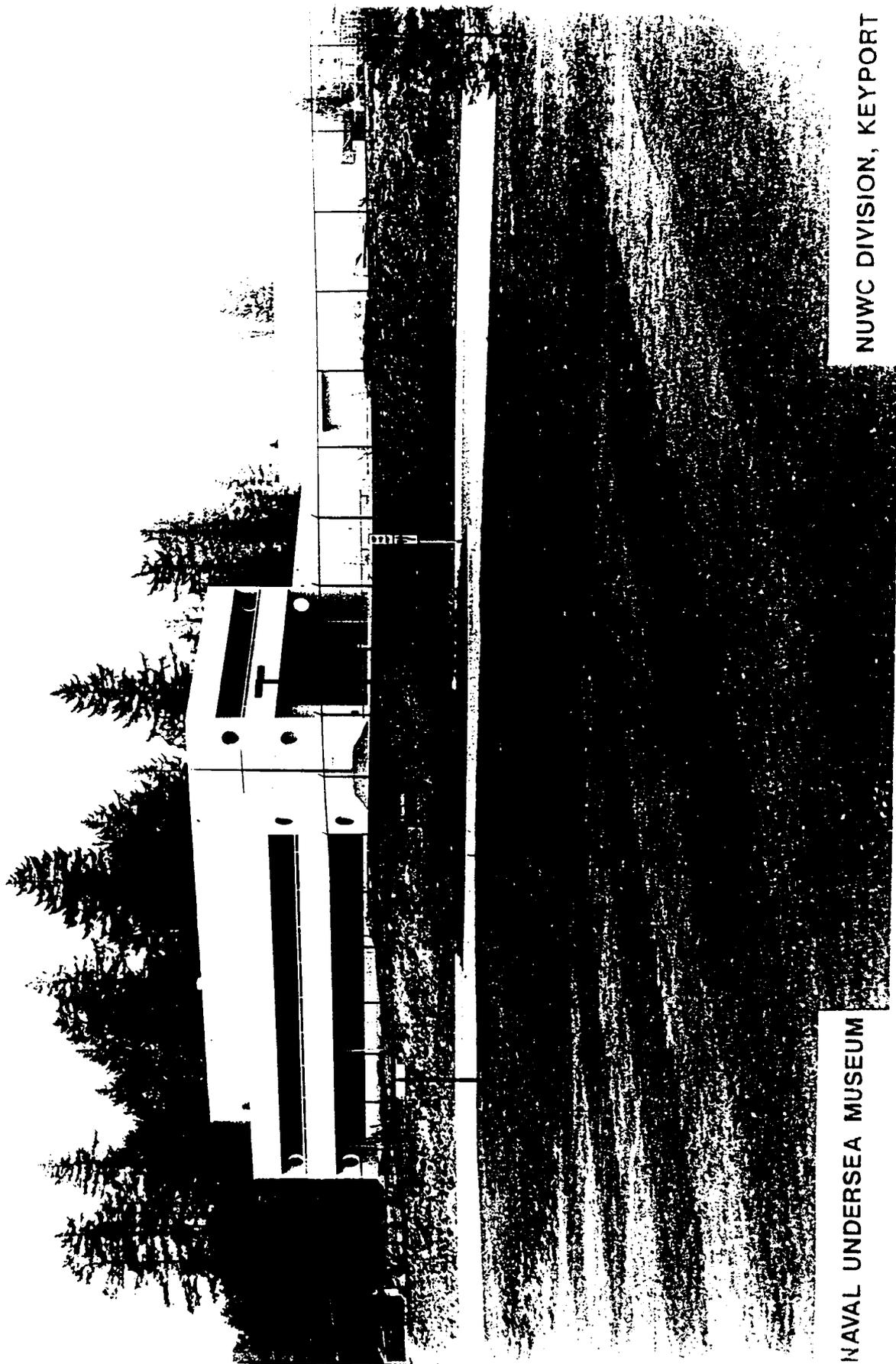
**15. Provide one 8 1/2 X 11 black and white photo of the facility/equipment.**

See attached photo.



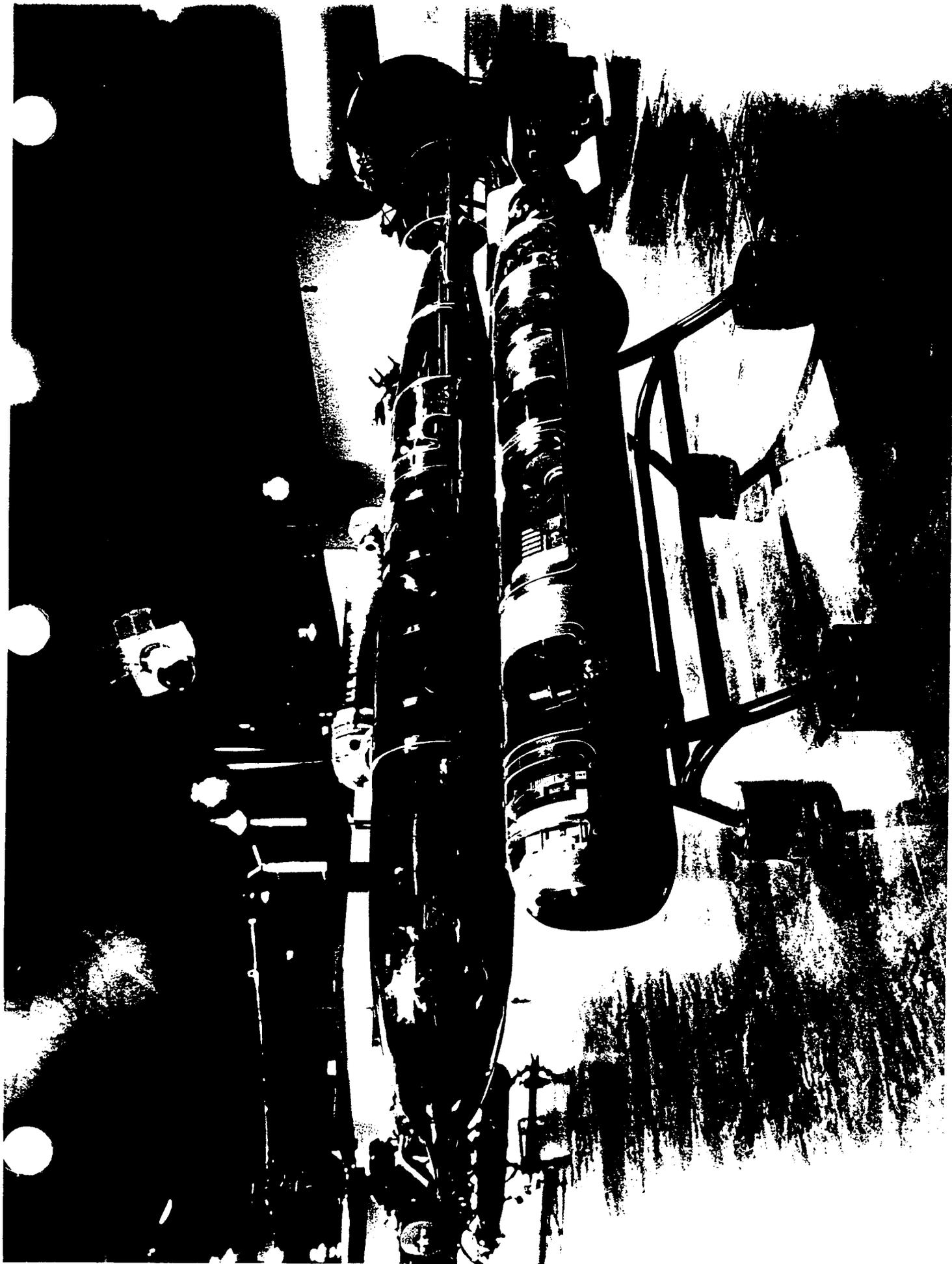
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NAVAL UNDERSEA MUSEUM

NUWC DIVISION, KEYPORT



**SPECIAL FACILITIES AND EQUIPMENT  
FACILITIES/EQUIPMENT CAPABILITY FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Facility/Equipment Nomenclature or Title	Arctic Submarine Laboratory, San Diego, CA

**1. State the primary purpose(s) of the facility/equipment.**

NUWC Division, Keyport's Arctic Submarine Laboratory (ASL) Detachment provides technical support to the Fleet in the conduct of submarine arctic operations, tests, and evaluations. The ASL staff, with an average of over 21 years of applicable and unique specialized experience in arctic warfare, are the Navy's premier experts in under ice submarine operations and are vital to the safe conduct of operations in the Arctic. Technical Ice Pilots from ASL are assigned to every U.S. and British submarine deploying to the Arctic to personally advise the Commanding Officers during the conduct of under ice operations. The Officer-in-Charge, ASL, also serves as an advisor to the Submarine Force Commanders, Atlantic and Pacific Fleets, to provide advice and technical support as required by the Force Commanders, and to conduct submarine arctic operations. The Officer-in-Charge is the Navy's submarine Arctic expert. He serves as the Officer-in-Charge of all Arctic Ice Camps, directing and coordinating the conduct of ICEX's in which current torpedoes and research and development models of future torpedoes are tested. A portable Arctic Tracking Range is installed to provide 3-dimensional underwater tracking of these torpedoes. ASL is the focal point in the Navy for all submarine related Arctic operations and research and development efforts.

**2. Indicate whether the facility/equipment is portable, moveable or fixed as defined by paragraph 6, 12 of this data call.**

The Arctic Submarine Laboratory facilities and equipment are moveable. It must be emphasized that is the highly experienced staff, not the facilities or equipment, that represent the essential capabilities of the Arctic Submarine Laboratory.

**3. Provide the replacement value of the facility/equipment. Report the facility/equipment cost separate from any building and utilities that may be integral to the facility/equipment.**

The replacement value of ASL facilities/equipment is estimated to be \$3.9M.



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**4. Provide the gross weight and cube of the facility/equipment.**

ASL's equipment occupies 15,000 cubic feet and weighs approximately 128,000 pounds.

**5. Indicate any "special" utility support required by this facility/equipment other than normal electrical power.**

No special utility support is required.

**6. Indicate any special budget requirements for the facility/equipment (i.e., special foundations, non-ferrous materials, shielding, hardening, etc.).**

There are no special budget requirements required for the facility and equipment.

**7. State any environmental control requirements for the facility/equipment (i.e., temperature, humidity, air scrubbing).**

Environmentally controlled storage (with constant temperature and low humidity) is required for the inventory of arctic survival clothing and gear.

**8. Indicate if this facility/equipment would be extremely difficult or impossible to replicate or relocate at another site and the impact to the Department of the Navy if this facility/equipment were lost. Consider existing Government-wide and commercial capabilities as the replication and impact statements are formulated.**

While it would be possible to relocate the facility to another site, the site must be in close proximity to the submarine Fleet to facilitate the installation and checkout of equipment being installed onboard Fleet submarines. If the highly specialized technical expertise represented by the personnel employed at ASL were lost, Navy submarines would operate in the Arctic Ocean at major risk. The Fleet's experience in operating in the Arctic is only as great as the degree of experience of personnel who remain on board a vessel which has deployed there. With the continuous rotation of Fleet personnel, this expertise is rapidly lost, while the corporate experience, resident at ASL, remains intact. The deployed ASL Technical Ice Pilots are the Navy's premier experts on arctic submarine operations. They maintain an expertise which must not be lost.

**9. Indicate how and when the facility/equipment was transported and or constructed at the site.**

The Arctic Submarine Laboratory was founded in 1951. Defense Battery Whistler was converted into office, laboratory, and shop facilities. The laboratory facilities expanded to



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include the Cryogenic Facilities (i.e., the Arctic Experimental Ice Pool and Sea Ice Cryostat Modeling Basin) and the Pressure Test Facilities. These facilities supported laboratory testing as well as field studies onboard submarines and at the Field Station at Cape Prince of Wales, Alaska. The Cryogenic Facilities and the Pressure Test Facilities are being permanently deactivated and are therefore not included in any of the estimates provided.

**10. List the functional support areas (previously provided in Tab A) that this facility/equipment support. Refer to Appendix A for the list of Functional support areas.**

- 5. Sensors & Surveillance Systems
  - 5.1 Sonar Systems
- 10. General Mission Support
  - 10.7 Major Range Development and Operation

**11. Provide the historical utilization average for the past five fiscal years (1989-1993). Define the unit of measure used.**

The historical utilization has been 100%. The unit of measure is U.S. Navy Arctic deployments in which ASL has had a leadership role throughout the planning, conduct, and post-deployment phases.

**12. Provide the projected utilization data out to FY 1997.**

The projected utilization is 100%. ASL's mission to provide the planning and operational support for all Arctic Submarine deployments and Ice Camp operations is unchanged.

**13. What is the approximate number of personnel used to operate the facility/equipment?**

Sixteen people work in direct support of Arctic Submarine Laboratory projects.

**14. What is the approximate number of personnel needed to maintain the equipment?**

Two people provide maintenance support for the laboratory.

**15. Provide one 8 1/2 X 11 black and white photo of the facility/equipment.**

See attached photos.

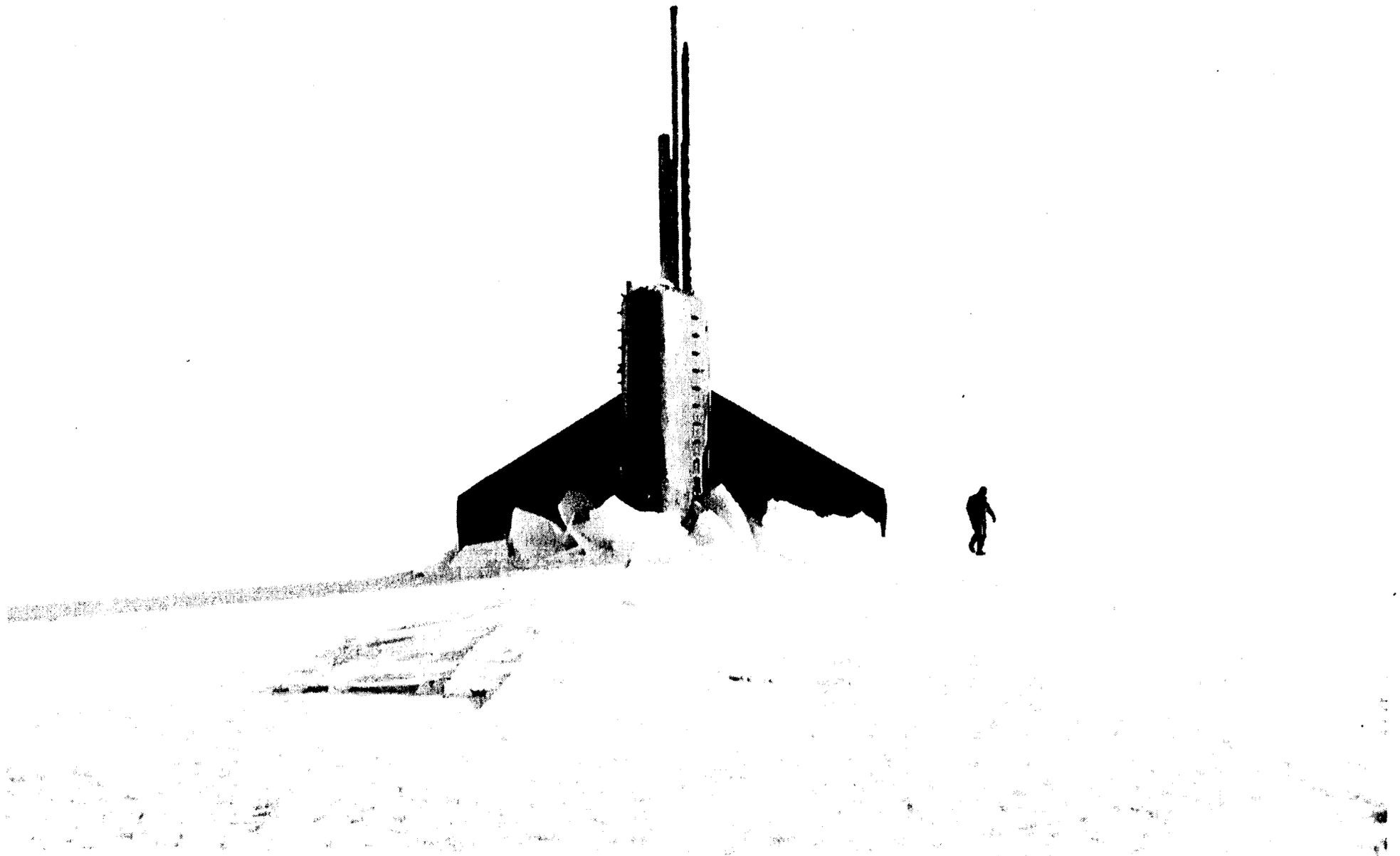


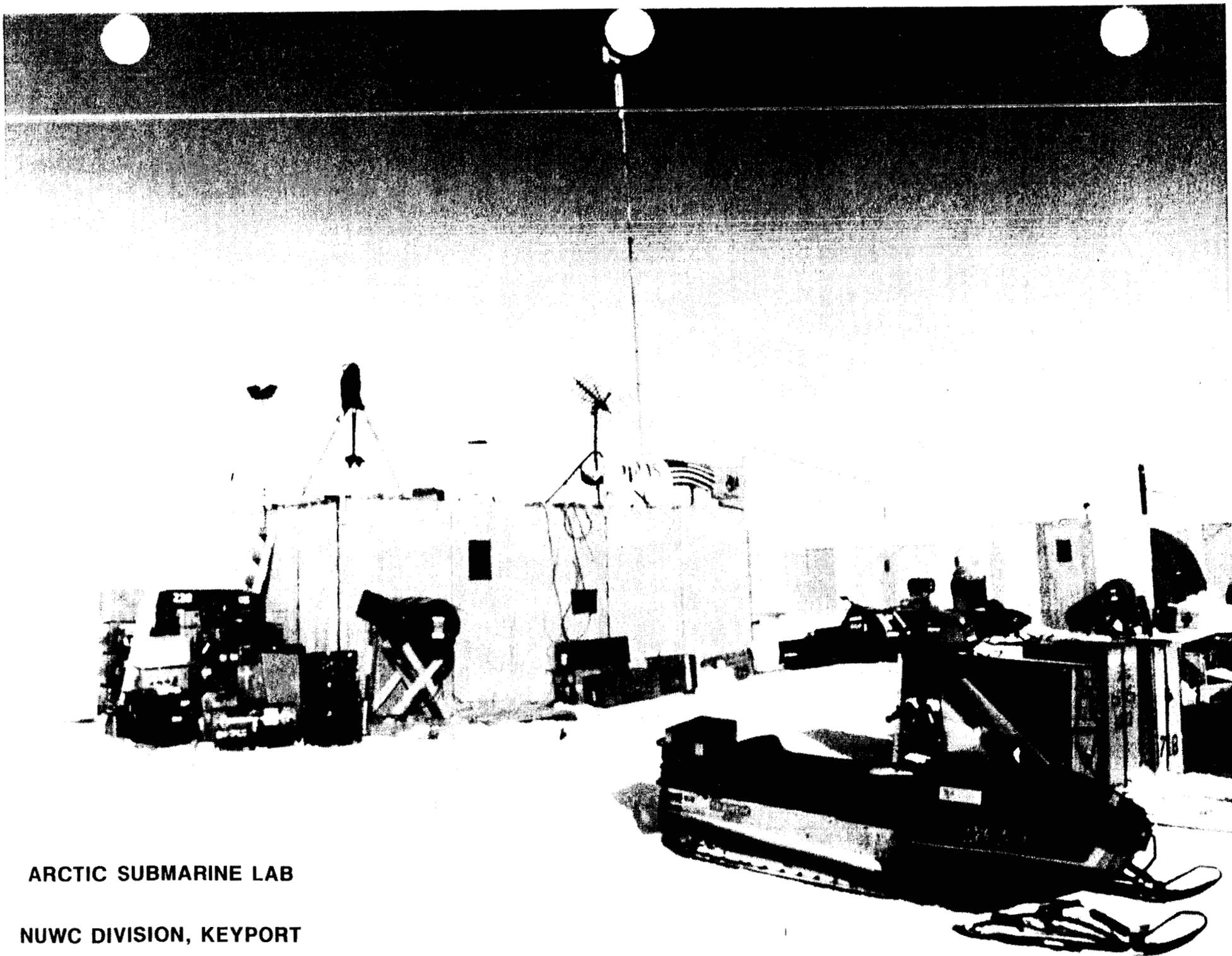
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ARCTI JBMARINE LAB

NUWC DIVISION, KEYPORT





ARCTIC SUBMARINE LAB

NUWC DIVISION, KEYPORT

**SPECIAL FACILITIES AND EQUIPMENT  
FACILITIES/EQUIPMENT CAPABILITY FORM**

Technical Center Site	NUWC Detachment Hawthorne, Hawthorne, NV
Facility/Equipment Nomenclature or Title	Navy Mine Depot

**1. State the primary purpose(s) of the facility/equipment.**

The mission of NUWC Division, Keyport's Hawthorne Detachment is to provide intermediate maintenance and depot overhaul of conventional underwater mines, as well as storage of a large quantity of naval mines. Hawthorne is the only Depot Overhaul Point for conventional naval mines. Hawthorne also performs Depot-level maintenance and refurbishment of the Chamber and Valve assembly for the MK 48/ADCAP Torpedoes. Hawthorne Detachment storage buildings are used as a receipt, segregation, storage and issue point for naval mine material. The Depot is supported by highly qualified technical personnel who have an average of over 15 years of applicable specialized experience.

**2. Indicate whether the facility/equipment is portable, moveable or fixed as defined by paragraph 6, 12 of this data call.**

The buildings are, of course, fixed. The equipment within the buildings, such as paint booths and machining tools, require ventilation and power sources other than 110 volts; however, this equipment would be considered moveable. The test sets for the mines and mine components would be considered portable.

**3. Provide the replacement value of the facility/equipment. Report the facility/equipment cost separate from any building and utilities that may be integral to the facility/equipment.**

Building 49-9 is 11,500 square feet, contains a paint booth, plastic media booth, welding booth, and a 2,000 pound overhead crane. It is used mainly for mine and mine component Depot-level overhaul. Building 49-10 is 13,000 square feet and has a 2,000 overhead crane. It is used mainly for Depot-level maintenance of mines and mine components. Building 104-3 is 11,000 square feet, has lightning protection, two 2,000 pound overhead cranes, a paint booth and a 4 foot by 12 foot water tank 5 feet deep for leak tests of mines and mine components. This is one of two explosive operating buildings. It is used for Depot-level maintenance of explosive mine components. Building 104-8 is 8,500 square feet, has



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lightning protection and a 2,000 pound overhead crane. It is used mainly for the Depot-level maintenance of Chamber and Valve Assemblies for the MK 48 and ADCAP Torpedoes. Building 104-5 is 20,350 square feet and contains a machine shop, carpenter shop, and fiber-board box making shop. It also serves as the receiving and issue point for all the mine material received and issued at the Detachment. Building 104-6 is 20,350 square feet contains the 'A' condition consumable supply storage, a hydrostatic test tank and two 2,000 pound overhead cranes. It is used mainly for handling and storage of Mines. Building 104-14 is 6,426 square feet contains the test set repair shop and serves as the Administrative Office area for the Detachment. The facilities utilized by the Detachment are "In Grant" facilities from the Army; the Detachment is a tenant of the Hawthorne Army Ammunition Plant. Replacement of the explosives operating buildings is estimated at a cost of \$147/ft<sup>2</sup>. The cost for the operating buildings would be \$2,866,500. Replacement of the remaining operating buildings is estimated at a cost of \$138/ft<sup>2</sup>. The cost of replacing the non-explosives operating buildings would be \$10,319,088. The adjacent 250,000 ft<sup>2</sup> of detachment storage used in support of the depot operation has not been considered as part of the replacement cost.

**4. Provide the gross weight and cube of the facility/equipment.**

Gross weight and cube for the equipment that is vital to the operation of the Detachment is 8,000 cubic feet and 7 tons.

**5. Indicate any "special" utility support required by this facility/equipment other than normal electrical power.**

Buildings 104-8 and 104-3 have lightning protection installed, as these are explosive operating buildings. Buildings 104-8 and 104-3 also have ordnance grounds installed. Buildings 49-9, 49-10 and 104-5 have 220 volt service. Building 104-14 requires a regulated power source for the test set repair shop.

**6. Indicate any special budget requirements for the facility/equipment (i.e., special foundations, non-ferrous materials, shielding, hardening, etc.).**

There are no additional special budget requirements for these facilities. A comprehensive review of future requirements has verified that these facilities have been sufficiently maintained/upgraded to ensure mission and compliance requirements are supported well into the future.

**7. State any environmental control requirements for the facility/equipment (i.e., temperature, humidity, air scrubbing).**



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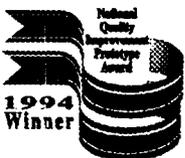
Building 104-7 is a freezer that is used to store mine batteries in a frozen condition and requires maintaining a temperature of minus 20 degrees F. Building 49-8 has within it 5 individual refrigeration units that are for battery storage and require the temperature to be maintained between 35 and 45 degrees F.

**8. Indicate if this facility/equipment would be extremely difficult or impossible to replicate or relocate at another site and the impact to the Department of the Navy if this facility/equipment were lost. Consider existing Government-wide and commercial capabilities as the replication and impact statements are formulated.**

The Hawthorne Detachment is a tenant of the U.S. Army Ammunition Plant. Both Detachment and U.S. Army facilities are used to support the depot evolutions at the Detachment. The Mine Depot could be relocated or replicated; however, the cost would be exorbitant if the Receipt, Issue, and Segregation function were also moved. A great deal of the Depot effort is synergistically related to the storage and Receipt, Issue and Segregation functions. The displacement of the Depot operation to a geographically separated facility would add substantial costs to the performance of the overall Depot function. The existing functions being performed by the Detachment are directly linked to the 250,000 square feet of storage space also located in the Detachment in addition to explosive storage used in the Army magazine areas. This space is used for storage of existing mine assets for the Navy and assets supporting the Depot functions performed by Detachment personnel. Significant transportation costs would be involved to move material to and from the Depot, should it be relocated at another facility. Another consideration would have to be the refrigeration. The impact on the Navy if this facility were lost as opposed to relocated/replicated is that this is the only Depot for Naval Mines, and a large portion of the long-term battery storage for the mines is maintained at the Detachment. In addition to any new construction that might be required to accommodate the material, the cost to move the inert storage to the new site would be significant. The loss of the explosives storage associated with the mine Depot that is located in the Army magazines would severely impact the ability to meet Fleet issue requirements for material from both the inert and explosive storage areas.

**9. Indicate how and when the facility/equipment was transported and or constructed at the site.**

The Hawthorne facilities were constructed in the 1930's and 40's as a Navy Activity and continued under Navy control until the activity was placed under Army control in the 1970's with the institution of the "single manager" concept. The responsibility for the Mine Depot Operations was not transitioned and has remained under Navy control since its establishment in the mid 1940's. The Detachment serves as a Navy point of contact for questions on other Navy assets under the control of the Army. Most of the buildings that make up the Detachment were constructed in the late 1930's and early 1940's. The mine Depot was



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established at Hawthorne in the mid 1940's. The most recent acquisitions at the Detachment were the new paint booth installed in 104-5, the paint booth installed in 49-9, and the plastic media booth installed in 49-9. These items were installed in 1993 and 1994.

**10. List the functional support areas (previously provided in Tab A) that this facility/equipment support. Refer to Appendix A for the list of Functional support areas.**

- 2. Weapons Systems
  - 2.4 Torpedoes
  - 2.5 Mines
- 10. General Mission Support
  - 10.1 Personnel and Training
    - 10.1.4 Weapons-Related Training Systems
  - 10.9 Activity Mission and Function Support

**11. Provide the historical utilization average for the past five fiscal years (1989-1993). Define the unit of measure used.**

Historical average utilization for the past 5 years has been 87%. (Percentage of operational use is based on a 40 hour week.)

**12. Provide the projected utilization data out to FY 1997.**

Projected average utilization out to FY97 is estimated to be 89%. The reason for increase is closure of MOMAGS and increased disposal operations of out-of-service mines and mine material. (Percentage of operational use is based on a 40 hour week.)

**13. What is the approximate number of personnel used to operate the facility/equipment?**

The number of people required with the current level of funding and workload is 16.

**14. What is the approximate number of personnel needed to maintain the equipment?**

The number of personnel required for the maintenance of the equipment utilized for Mine Depot-level maintenance is four.

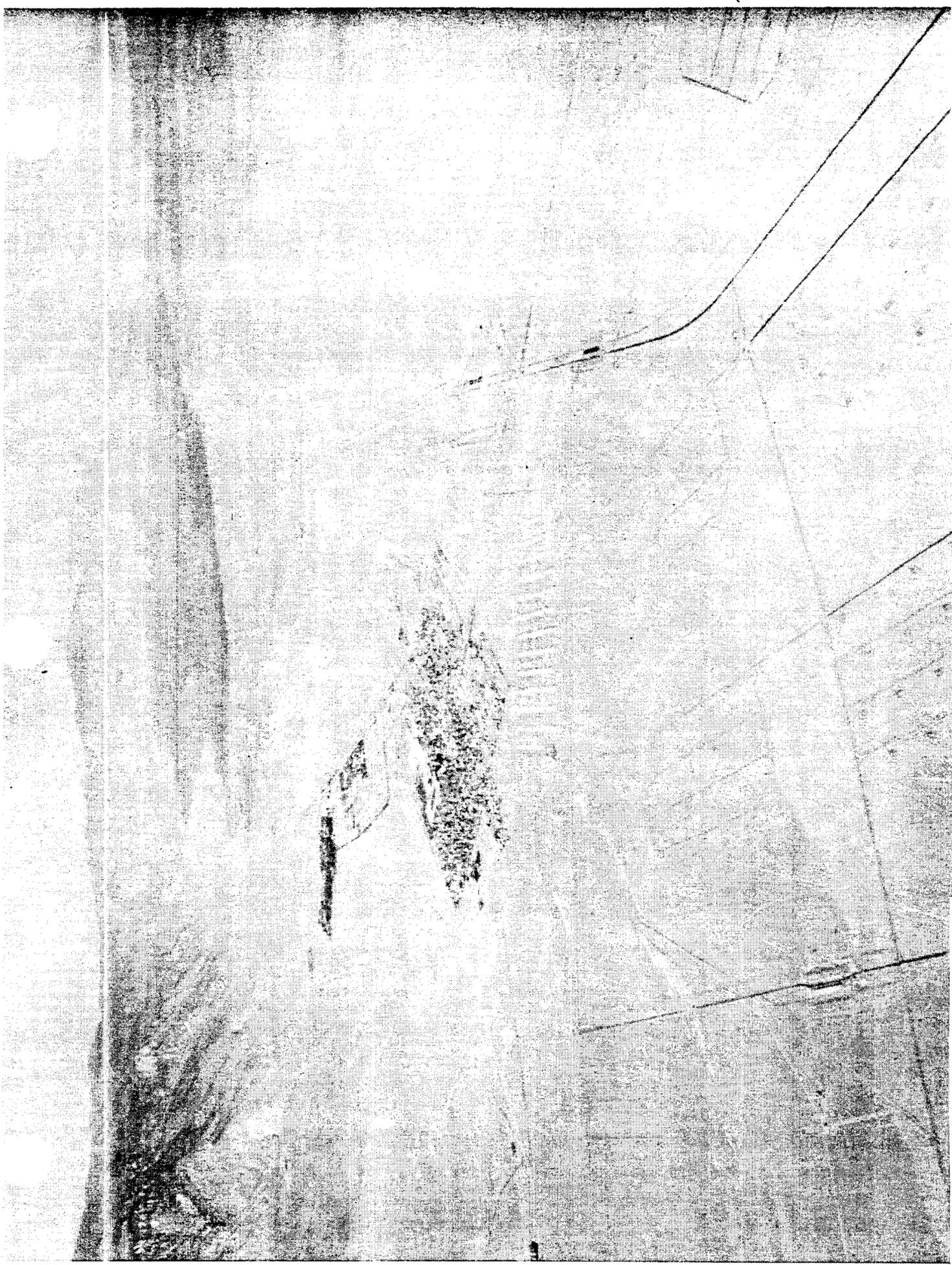
**15. Provide one 8 1/2 X 11 black and white photo of the facility/equipment.**

See attached photo.



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HAWTHORNE NAVY MINE DEPOT

NUWC DIVISION, KEYPORT

**7. General Facilities.**

a. Is there any cash revenue generated by this activity? Example: Electricity generated at this activity and sold to the local community. If yes, describe.

NUWC Division, Keyport has the capacity to generate emergency power to support critical operations. This capacity does not extend to supporting the local community.

b. What MILCON projects are currently programmed to be completed by the end of FY1995? For each project provide:

(1) A description of the proposed facility with title and project number. Be sure to include the trailing alpha designator for BRACs-88, 91 and 93 realignment projects, i.e., P-xxxR, P-xxxS, P-xxxT.

MILCON P-370, Hazardous Waste Transfer, Storage, and Disposal Facility, will provide a state-of-the-art facility for treating, storing, and disposing of hazardous wastes generated by industrial processes. Currently under construction, the building itself will be self-contained and part of the containment system, thereby maximizing the protection of the environment and human health by eliminating the risk of release. When completed, this facility will support both internal and external customers and will have the capability to support surge waste generation through long term storage capacity. This surge capacity will help minimize costs by providing time to put cost reducing recycling alternatives in place.

(2) The functional support area(s) that the new facility will support. Refer to Appendix A.

The Hazardous Waste Transfer, Storage, and Disposal Facility will primarily support Functional Support Areas 2.4 Torpedo Weapons Systems, 2.5 Mines Weapons Systems, 2.9 Fire Control, 5.1 Sonar Systems, 8.2 Countermeasures (CM), and 10.9 Activity Mission and Function Support.

(3) Identify installed equipment to be provided based on the threshold guidance of paragraph 6, page 12, of this data call.

There is no single piece of equipment in this facility with a replacement value greater than \$500,000.



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(4) The additional square footage that this project will provide to the functional support area(s).

This project will provide an additional 53,250 square feet.

(5) The current working estimate (CWE) & planned beneficial occupancy date (BOD) of the project.

CWE - \$8,400,000; BOD - April 1995.

c. Section C has parts c-1 through c-4.

c-1 What MILCON projects are currently programmed to be executed/completed after FY1995? For each project provide:

(1) A description of the proposed facility with title and project number.

MILCON P-336, Regional Cleaning and Metal Preparation Facility Consolidations, will enable NUWC Division, Keyport to perform cleaning and metal finishing in an environmentally responsible and occupationally safe manner. Puget Sound Naval Shipyard (PSNS), located approximately 14 miles south of Keyport, also has a cleaning and metal preparation facility. A joint study between NUWC Division, Keyport and PSNS was conducted to determine the most cost-effective way for both activities to accomplish their chemical-bath, metal-preparation work from a regional standpoint. The study concluded that each activity should retain their critical metal preparation processes, eliminate duplicate processes, and contract out the low-use processes. It would not be cost effective to retain low-use processes at either facility. The high-use processes are critical to each activity's mission and must remain in the local area. Since the high-use processes are different for each activity, each one will retain its own and perform that work for the other activity. The ability to perform metal finishing is essential to the mission of both activities and is vital for meeting surge requirements.

(2) The functional support area(s) the new facility will support.

This facility will primarily support Functional Support Areas 2.4 Torpedo Weapons Systems and 2.5 Mines Weapons Systems.

(3) The identified installed equipment to be provided based on the threshold guidance of paragraph 6, page 12, of this data call.

There is no single piece of equipment in this facility with a replacement value greater than \$500,000.



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(4) The additional square footage this project will provide to the functional support area(s).

This project will provide an additional 5,700 square feet.

(5) CWE & planned BOD.

CWE - \$5,300,000; BOD - August 1997.

c-2 What MILCON projects are currently programmed to be executed/completed after FY1995? For each project provide:

(1) A description of the proposed facility with title and project number.

MILCON P-315, Sanitary Wastewater System at the Undersea Warfare Annex, will connect 14 buildings to the SUBASE sanitary sewer system and will replace inadequate septic tanks and drain fields.

(2) The functional support area(s) the new facility will support.

This system will primarily support Functional Support Areas 2.4 Torpedo Weapons Systems and 2.5 Mines Weapons Systems.

(3) The identified installed equipment to be provided based on the threshold guidance of paragraph 6, page 12, of this data call.

This project constructs a sanitary sewer system to serve buildings housing equipment that is vital to the preparation of warshot weapons. This project itself will not have any additional installed equipment.

(4) The additional square footage this project will provide to the functional support area(s).

The project will provide an additional 8,600 lineal feet of sanitary sewer line.

(5) CWE & planned BOD.

CWE - \$650,000; BOD - April 1998.



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c-3 What MILCON projects are currently programmed to be executed/completed after FY1995? For each project provide:

- (1) A description of the proposed facility with title and project number.

MILCON P-334, Environmental Test Facility, will provide an environmentally compliant and occupationally safe facility to perform functional (electronic and mechanical) and environmental (vibration, temperature, etc.) testing of components and subassemblies of underwater vehicles. This is a regional asset which supports work from Puget Sound Naval Shipyard; Naval Submarine Base, Bangor; Naval Station Everett; Naval Air Station Whidbey Island; other CONUS Naval Commands, the U.S. Air Force, and private industry.

- (2) The functional support area(s) the new facility will support.

This facility will primarily support Functional Support Areas 2.4 Torpedo Weapons Systems and 2.5 Mines Weapons Systems.

- (3) The identified installed equipment to be provided based on the threshold guidance of paragraph 6, page 12, of this data call.

There is no single piece of equipment in this facility with a replacement value greater than \$500,000.

- (4) The additional square footage this project will provide to the functional support area(s).

This project will provide an additional 28,500 square feet.

- (5) CWE & planned BOD.

CWE - \$1,650,000; BOD - April 1998.

c-4 What MILCON projects are currently programmed to be executed/completed after FY1995? For each project provide:

- (1) A description of the proposed facility with title and project number.

MILCON P-313, Fleet Test Support Facility, will house equipment and personnel for evaluation of combat and navigational systems on surface ships and submarines. The project consolidates and allows concurrent Fleet operational testing and evaluation, reduces Fleet time-in-transit and related cost of operations, and improves quality of life for detachment



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personnel.

(2) The functional support area(s) the new facility will support.

This facility will primarily support Functional Support Areas 2.4 Torpedo Weapons Systems and 2.5 Mines Weapons Systems.

(3) The identified installed equipment to be provided based on the threshold guidance of paragraph 6, page 12, of this data call.

There is no single piece of equipment in this facility with a replacement value greater than \$500,000.

(4) The additional square footage this project will provide to the functional support area(s).

This project will provide an additional 2,800 square feet.

(5) CWE & planned BOD.

CWE - \$1,650,000; BOD - April 1998.

d. What is the distance (in miles) to the nearest military airfield and/or pier not located at your site? Describe. Assume all previous BRAC closures have been executed.

Whidbey Island Naval Air Station is 52 air miles to the north and McChord Air Force Base is 34 air miles to the south. This Division's Keyport/Bangor Dock is 0.6 of a mile from the Delta Pier at Naval Submarine Base, Bangor.

e. How many certified magazines, used for the storage of explosives, does this activity own or control?

NUWC Division, Keyport owns 77 certified magazines. Fifty-four of these magazines have assigned capacities greater than 0 pounds of Hazard Class 1.1 (most powerful), and 18 magazines have assigned capacities equal to 0 pounds of Hazard Class 1.1.

What is the total explosive weight storage capacity?

The total explosive weight storage capacity is 5,843,000 pounds of Hazard Class 1.1.



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## LOCATION

### 8. Geographic Location.

The Naval Undersea Warfare Center Division, Keyport is located in the state of Washington on the Puget Sound, some 10 miles west of the city of Seattle and just north of the city of Bremerton (see Figure 8-1). In addition to major facilities and activities in the Pacific Northwest, NUWC Division, Keyport maintains detachments in San Diego, California, and Hawaii as part of the Fleet Operational Support Department and in Hawthorne, Nevada. The strategically located facilities of the Fleet Operational Support Department, in combination with those located at Keyport, allow this Division to provide ready support to Fleet units at **all** major Navy home ports in the Pacific. As the Navy's only depot for all conventional mines, NUWC Division, Keyport maintains mine depot and storage facilities at the Hawthorne Detachment, 130 miles southwest of Reno.

**a. Is there an imperative in facility, function or synergy that requires the installation/base/facility to be in its present location? If yes, describe.**

Yes. All of the facilities that comprise the Navy's industrial core capability for in-service undersea weapons are collocated at the Naval Undersea Warfare Center Division, Keyport. This includes the Navy's depots for all torpedoes, torpedo IMA's, light industrial support facilities, underwater torpedo tracking ranges, warhead explosive and storage facilities, test and evaluation data collection and analysis facilities, hardware environmental test facilities, Hazardous Waste Treatment storage and disposal, Lithium decontamination facility, Otto Fuel II Reclamation Plant, and the supporting physical infrastructure.

Integral to these facilities is a system of underwater tracking sites, termed the Northwest Range, that support Fleet training, antisubmarine tests, and undersea warfare test and evaluation. It would be cost prohibitive, if not impossible, to relocate these ranges assuming alternate sites with similar diverse yet unique characteristics could be identified. Since all of these range sites are easily accessible to the open ocean, their testing capabilities are available to any ship in the Fleet. In addition, these sites are readily accessible to air operations by staging aircraft and helicopters from nearby Naval Air Station, Whidbey Island. All Northwest Range sites, together with the Underwater Weapon Evaluation Facility (UWEF), are remotely linked to the Range Information Display Center at Keyport. This allows data from all of the range sites and the UWEF to be viewed and processed at one central location. Centralized data acquisition and analysis allows for consolidation of support resources and the manning of range sites as required to support customer requirements. This Division's largest range site is located in Canadian waters at Nanoose, British Columbia. Its operation is shared with Canada under a long-term formal international agreement. On occasion, temporary tracking ranges are established at remote locations, including the Arctic, to support specific



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tracking requirements.

Smaller underwater tracking ranges used principally for shipboard sensor calibration and platform radiated noise measurement, are located at both the San Diego and Hawaii Detachments, adjacent to major Pacific Fleet home ports and larger Fleet training ranges. These locations provide easy access for Fleet units involved in "refresher training" and transiting between their home port and Fleet training ranges. The very nature of antisubmarine test and sensor accuracy trials precludes these tests being done on the much larger and busier Fleet training ranges.

Its location places this Division in close proximity to the Puget Sound Naval Shipyard and the Fleet and Industrial Supply Center, Puget Sound in Bremerton; Naval Submarine Base, Bangor; Naval Ordnance Center Detachment, Port Hadlock; Naval Station, Everett; Naval Fuel Depot, Manchester; Naval Air Station, Whidbey Island; and numerous other DOD and other government facilities (e.g., McChord Air Force Base, Fort Lewis Army Base, and United States Coast Guard.) NUWC Division, Keyport enjoys a synergistic relationship with these activities, with Keyport depending on them for the provision of materials and services and provides services and products in return.

In addition to its close proximity to major Fleet home ports, NUWC Division, Keyport enjoys other benefits from its location on the Kitsap Peninsula. It is close to major civilian port facilities in Seattle, Everett, Bellingham, Anacortes, and Tacoma that complement military port facilities. The close proximity of an international airport south of Seattle and military airfields at McChord Air Force Base and Naval Air Station, Whidbey Island facilitate shipment of equipment. The year-round temperate climate of the Puget Sound area enhances overall productivity. There is also abundant cheap hydroelectric power and dedicated clean water supplies that provide Keyport with the basic resources it needs to get the job done effectively and economically.

#### **PRINCIPAL DRIVERS:**

- The unique marine environment for testing of undersea weapons.
- The Navy's only high accuracy underwater tracking ranges specifically designed for undersea weapons test and evaluation are internal to this Division.
- The need to maintain the Navy's only industrial core capability for undersea weapons in support of weapon reconstitution, mobilization, readiness, and second-strike requirements.
- The requirement to provide facilities for the maintenance, preservation, and stowage of undersea weapons (i.e., warhead installation facilities, magazines, and secure storage.)



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- The support afforded NUWC Division, Keyport by close proximity to Fleet assets (i.e., ships, aircraft, and facilities) that provide target services and launch platforms for this Division's undersea warfare test and evaluation mission.
- The need to operate and maintain the Navy's only littoral test ranges (120-1,300 feet deep).
- The support afforded to the Fleet due to NUWC Division, Keyport's close proximity to Fleet home ports, (e.g., ASW test, sensor accuracy checks, etc.)
- The long-term agreements with Canada to jointly operate and support the underwater tracking range site at Nanoose, British Columbia. Commodore R. L. Preston, Director General, Maritime Engineering and Maintenance, has declared the Nanoose range site "operationally essential to the mission and viability of the Canadian Maritime Forces."
- The proximity of this Division to Navy deep water ports (e.g., Naval Submarine Base, Bangor and the new Fleet home port at Naval Station, Everett.)
- The proximity of this Division to other Navy and DOD facilities that provide operational and logistic support, such as Quick Trans shipments at McChord Air Force Base.

**b. What is the importance of the present location relative to customers supported?**

- Facilitates providing service to the Fleet due to close proximity to **all** major Pacific Fleet home ports.
- Proximity to the Navy's only littoral and mid-depth (allowing bottom recovery of hardware without crush damage) underwater tracking ranges with permanently installed tracking instrumentation. NAVSEA Program Executive Officer for Undersea Warfare has declared the tracking range at Nanoose, British Columbia "the single most important core capability to PEO-USW."
- Proximity to Fleet assets (i.e., ships, aircraft, and facilities) that support this Division's undersea warfare test and evaluation mission and thereby our DOD customers.
- Proximity to Navy deep water ports (e.g., SUBASE Bangor and the new Fleet home port at Naval Station, Everett.)
- Proximity to other Navy and DOD facilities that provide operational and logistic support to this Division and thereby our DOD customers. (See map on following page.)
- Adjacent to submarine forces (a primary ultimate customer of this Division) at Naval Submarine Base, Bangor and Puget Sound Naval Shipyard.
- Colocation of Fleet customers; storage, explosives, and depot facilities; test and evaluation capabilities; and light industrial support for undersea weapons and systems is an essential element for reconstitution of forces when that becomes necessary.



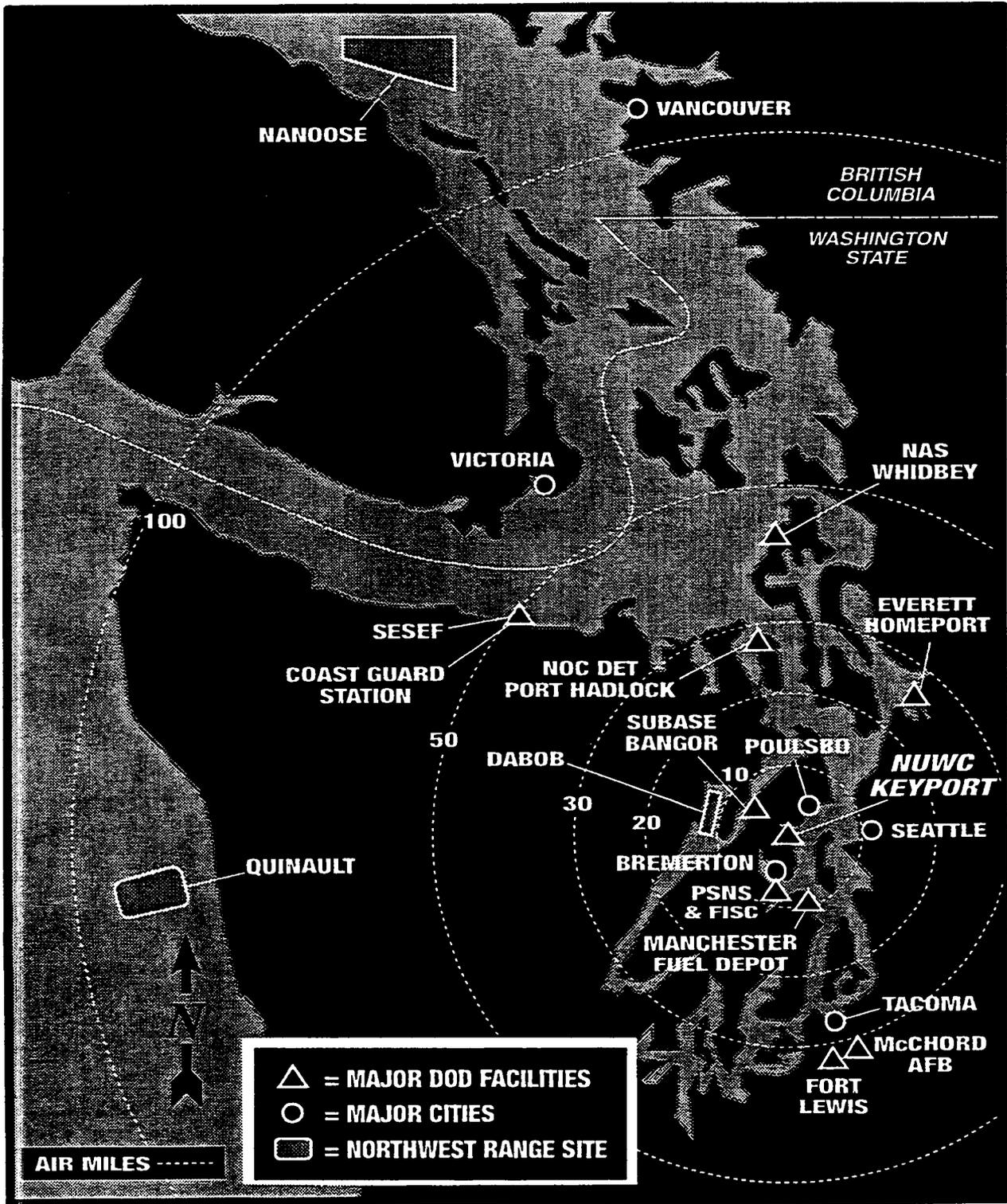
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## FEATURES AND CAPABILITIES

### 9. Computational Facilities.

a. Describe the general and special computational capabilities at this site. Include super computing, parallel computing, distributed computing and networking. Include high-speed data transfer, fiber optic links, microwave links, network interconnectivity and video teleconferencing capabilities. Do not discuss desktops and laptops except as they relate to networking.

Computational capabilities at NUWC Division, Keyport are based predominantly on general purpose computing components, which in many cases are augmented with very specialized signal processing, data analysis, or presentation hardware and software. This Division has consciously moved away from very large, highly unique and expensive computational facilities in favor of down-sized, higher performance, modular, and lower cost platforms that are based on Open Systems standards. The uniqueness of NUWC Division Keyport's computational capabilities is oriented to real-time processing, parallel processing, concurrent processing and distributed computing.

The following paragraphs provide a synopsis of the NUWC Division Keyport's computational capabilities. These capabilities are focused on assuring war fighting readiness of ship, systems and weapons.

#### 9.1 Engineering and Industrial Support Computational Capabilities:

9.1.1 Data Repository Capabilities: The Engineering Data Management and Information Control System is a large scale (2.4 terabyte) digital repository that provides for storage, distribution, and retrieval of technical data that is in a digital format. A companion system to this master repository allows for the networked distribution of over 85 gigabytes of technical reference data that is used by the engineering community. This subscription data includes military standards, military specifications, industry standards, special handling requirements, and integrated circuit and vendor catalogs. These distributed systems operate in either interactive or batch mode to allow customers to retrieve data from optical storage media and assemble groups of information that they need to review and/or analyze. These systems are composed of a mixture of platforms that allow decentralized support for a wide variation of needs, including conversion of paper and microfilm data to digital format, integration with Computer Aided Design/Computer Aided Engineering systems, and distributed client/server support for retrieval and review of the data. All of these functions are supported between Keyport, WA; Newport, RI; and Crystal City, VA. This distributed support is enabled by the use of high bandwidth (256Kb - T1) point-to-point communications. The 1,100 square feet of air-conditioned computer space that houses these systems features raised flooring and is



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supported by an Uninterruptible Power Supply. NUWC (both the Keyport and Newport Divisions) are the primary customers of these facilities.

9.1.2 Engineering CAD/CAM/CAE Systems: NUWC Division, Keyport supports a wide variety of Computer Aided Design (CAD), Computer Aided Engineering (CAE), and Computer Aided Manufacturing (CAM) systems. With over 30 stations from Intergraph, Computer Vision, and Schlumberger, this Division is able to support the design, documentation, and analysis of range, weapon, and combat systems and the associated test and support equipment. In addition, these computer systems allow the development of the machine control data necessary to drive over 50 Computer Numerical Controlled systems to support a Flexible Computer Integrated Manufacturing environment. This distributed control of industrial resources is enabled via a Distributed Numerical Control network that utilizes fiber optic and broadband transmission technology to move the machine control files between the CAM lab and the shop floor. There is currently over 3,900 square feet of office space used to support this Division's four primary CAD/CAE/CAM labs. Most of these labs provide an air-conditioned environment with some special power considerations to support the computer systems. These facilities are used to support work done by Keyport in direct support of NAVSEA and NAVAIR sponsored programs.

9.1.3 Publications Management Capabilities: This computational capability supports a classified system that is used to develop and maintain technical publications and operational procedures. This documentation is maintained via advanced work stations that utilize client/server technology to support desktop publishing capabilities across a classified network of six work stations. This system is housed in a 1,000 square foot air-conditioned facility that has raised floors and is secured for classified access and computing. These facilities are used to support work done by Keyport in direct support of NAVSEA sponsored programs. Electronic media developed by this system is passed to the local Department of Defense Printing and Publication Service, which is responsible for publishing and distributing the documents to the applicable Navy shore, Fleet, and contractor activities. In 1992 this activity won the Secretary of Defense Quality and Productivity Improvement Excellence Award for significant improvements in Technical Manual Publishing.

9.1.4 Configuration Management Capabilities: This computational capability supports the four locally installed systems and the over 25 remote system installations that rely on the three primary Configuration Management applications which are used and supported by NUWC Division, Keyport. These nationally distributed systems operate across a multitude of operating platforms via standard point-to-point and Internet network connections to support the data system intensive activity that is necessary to track and manage the activities involved in maintaining the engineering baselines for over 50 weapon, combat system, and platform baselines. These capabilities directly support NAVSEA, SPAWAR, Naval Medical, NAVAIR, NSWC, and Naval Ordnance Center activities and programs. These systems are



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maintained in 800 square feet of office space and 200 square feet of air-conditioned, raised floor computer room space that is supported by an Uninterruptible Power Supply.

9.1.5 Electronic Commerce Facilities: This computational capability supports several micro/minicomputer servers that allow text and image data to be assembled into standard Electronic Data Interchange formats and transmitted to and from other government and contract sites. These standard digital bundles are also routed through the Fleet and Industrial Supply Centers to the Navy Ships Parts Control Center and Air Supply Office to support logistics, in-service engineering, and procurement activity. These transfers are enabled by the use of high bandwidth telecommunications connections between Keyport and each of these sites. These systems are housed in approximately 100 square feet of standard office space, and have excess capacity over their current utilization.

## 9.2 Test & Simulation Computational Capability:

9.2.1 Underwater Weapon Evaluation Facility: The Underwater Weapon Evaluation Facility is a system capable of complete, self-powered, captive land-based weapon testing, including propulsion, complete weapon acoustics, and guidance/control closed-loop operations. The computational capability associated with this environment is massively parallel, realtime, and dedicated to this function. This computational capability is used to simulate and stimulate acoustics and hydrodynamics of an actual in-water test run. This capability is also used to collect weapon test data in realtime. The Underwater Weapon Evaluation Facility computational capability consists of a network of 15 microcomputers, one minicomputer, one General Purpose Parallel Computer, and one Dedicated Parallel Computer used for acoustic signal processing. The Underwater Weapon Evaluation Facility is a classified environment located within a 1,000 square foot computer room equipped with a raised floor and HVAC. It has no excess computational capacity or computer room floor space. NAVSEA weapons program offices are the primary customers of the services provided.

9.2.2 Range Data Gathering and Processing System: This system supports five sea-based test range facilities located at or near Nanoose, British Columbia Canada; Dabob Bay, WA; Quinalt, WA; Oahu, HI; and San Clemente Island, CA. This computational capability includes parallel processing, distributed computing capabilities and microwave and fiber optic communications capabilities. These facilities collect, process and present underwater, surface and tactical test data in realtime. This capability includes 70 network signal processing micro-computers, 15 minicomputers and a suite of specialized microprocessors. This capability supports both classified and unclassified activities and voice, data, and video technologies. This capability is housed in a total of 10,000 square feet of air-conditioned, raised computer room floor space with Uninterruptible Power Supply support. There is excess computational and floor space capacity. The primary customers are program offices, laboratories, the Fleet, and foreign governments.



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9.2.3 Range Information and Display Center. The RIDC is a remote multi-media viewing node of the NUWC Northwest Range System. Information can be displayed from multiple ranges simultaneously in real-time or synchronized replay. In effect, a viewer in the RIDC has the sensation of being on range during a live test. This includes full motion video of surface or airborne platforms; graphical displays (3D track) of weapons, targets, and launch and recovery craft used in the test; voice traffic occurring during the test; and sonar acoustical waterfall displays generated during the test.

The RIDC is an assemblage of very specialized real-time computing capabilities, multi-media interfaces, switching technologies, and multi-media presentation devices. The RIDC collects, processes, and integrates data from the Range Data Gathering Systems utilizing a high-speed (6.2 M bits/s) secure microwave system. Components of ranging information (voice, data, video, and graphics) are mixed to present selected views of a system under test, on range, in real time. The RIDC can feed presentation information to other sites serviced by sufficient communications capacity. It is also used as a Video Teleconferencing (VTC) facility between range sites and Keyport. The RIDC can accept preprocessed range data from any similarly equipped range facility.

This is a very unique capability that dramatically reduces costs by reducing travel requirements of test engineers, program managers, and range support personnel. In addition to viewing in real time, RIDC users can choose viewing of recorded range events to fit individual schedules. This leads to increased productivity due to better time management. The RIDC is housed in a 1,500 square foot, secure, raised-floor computer room with Uninterruptable Power Supply support.

9.2.4 Weapon System Proofing & Analysis System: This computational capability reduces, analyzes, and reports operational performance test results for undersea weapons tested on this Division's various ranges, as well as tests occurring at Fleet Training Areas that are analyzed for weapon quality evaluation and upgrade purposes. This system is the primary U.S. Navy analysis support facility for evaluation of operational testing of undersea weapons conducted by COMOPTEVFOR. The computational capability includes distributed computing, artificial intelligence, and secure fiber optic, microwave, and ethernet communications services. The system includes 15 engineering work stations networked to a cluster of three minicomputers running very specialized software. Classified processing is supported in a 3,000 square foot, air-conditioned raised floor computer room with Uninterruptable Power Supply support. This capability has 25 percent excess computational and floor space capacity. The primary customers of this service are weapon system program offices, manufacturers, laboratories, and design agents.

9.2.5 Undersea Noise Analysis Facility: This computational capability measures, collects, analyzes, and reports acoustic, vibration, and accelerometer test results for all types of



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surface and subsurface platforms. This capability includes realtime and parallel processing and interactive, distributed, and client/server configurations. It includes 12 high performance engineering work stations and a concurrent engineering minicomputer networked together. This capability includes high-speed communications, secure long distance communications, and support of digital data that represents tabular reports, audio, and graphical images. The primary customer is the Fleet.

**9.2.6 Type III Magnetic Silencing Range and Magnetic Treatment Measurement System:**

This computational capability includes the In-Service Engineering support and central data management for nine magnetic ranges located at or near Bangor, WA; Kings Bay, GA; Norfolk, VA; San Diego, CA; Pearl Harbor, HI; Mayport, FL; New London, CT; Charleston, SC; and Yokosuka, Japan. This capability is used to measure and perform analysis on ship magnetic signature data to determine if adjustment is in order. This capability also includes support for the treatment systems. The system at Keyport includes six specialized microcomputers with secure local and national communications capabilities. It is located in a 150 square foot computer room with a raised floor and Uninterruptable Power Supply support. The primary customer is the Fleet.

**9.2.7 Surface Ship Radiated Noise Measurement:** This capability includes activities related to In-Service Engineering support for two noise measurement ranges located near San Diego, CA and St. Croix, Bahamas. The Surface Ship Radiated Noise Measurement system performs measurement, analysis, and reporting of surface ship radiated noise. Keyport has developed turnkey systems using four microcomputers networked to two minicomputers. The Surface Ship Radiated Noise Measurement includes a client/server configuration and supports secure processing in an air-conditioned, raised floor computer room with Uninterrupted Power Supply support. The primary customer is the Fleet.

**9.2.8 Stationary Target Systems:** This specialized computational capability includes systems that support nine simulated targets. These systems receive and perform Digital Signal Processing (DSP) on incoming signals and in realtime generate target silhouettes and scenarios. This capability includes nine mini-computers and roughly 20 DSP microprocessors. This capability is onboard range craft and not in a traditional computer room. Data communications support is provided by range RF radio systems. Data traffic is predominately unclassified. The primary customers are NAVSEA program offices and weapons technical design agents.

**9.2.9 AntiSubmarine Warfare Analysis System:** The ASW Analysis System is a land-based comprehensive test reconstruction, data extraction, and analysis capability. The system is used in the full-scale reconstruction of both U. S. Fleet and allied navy operations and exercises. Data available via this capability is used for detailed analysis of shipboard and weapon systems, operational evaluations and assessments, system development and operational test and



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evaluation, and training and developmental efforts. This system is comprised of one large-scale minicomputer, three superminicomputers, and several microprocessor computers which are networked together via a high-speed local area network. These computers process classified and unclassified data in two raised floor computer rooms. The facilities include a 1,250 square foot raised floor computer room located at Lualualei, Oahu, and a 200 square foot raised floor computer room at Barking Sands, Kauai. Both sites are supplied with heating ventilation, and air conditioning and conditioned power. The primary customers of this capability are the U. S. Naval Fleet and foreign naval fleets.

9.2.10 Consolidated Automated Support System: The consolidated Automated Support System is designed to meet a wide range of test technologies, including high-speed digital, analog, and hybrid applications from a wide range of systems and electronic equipment. This capability supports both depot and intermediate level repair for defense as well as non-defense organizations. Current capabilities include four test platforms (three hybrid core stations and one communications, navigation, and instrumentation configuration station). This capability also includes approximately 20 Test Program Set Development work stations and is housed within a 600 square foot computer room with a raised floor and heating ventilation, and air conditioning support. This unique capability offers unclassified, distributed, and real-time processing on top of a 10 Mbps Ethernet.

9.2.11 Aircraft Carrier Anti-Submarine Warfare Module: This capability is an integrated digital processing and acoustic analysis system. It is designed to provide Antisubmarine Warfare (ASW) mission planning, realtime command and control support, and mission assessment information to the Officer in Tactical Command, respective warfare commanders, and all ASW platforms assigned to the Task Force. This capability includes an AN/UYK-43 computer system which is housed in a secure, raised-floor computer room equipped with heating ventilation, and air conditioning and chilled water. Nineteen sites are supported by this capability. The primary customers are the Fleet, AIRPAC, and AIRLANT.

9.2.12 Combat Systems Trainer Laboratory: This capability is used for developing trainer system upgrades and support of trainer system maintenance. The unique capability associated with this system is its ability to simulate real-time tactical scenarios for sonar operators. The system is composed of a microcomputer, minicomputer, and a mainframe. The system is housed in a secure, 4,400 square foot, raised floor computer room that is equipped with Uninterrupted Power Supply support a chilled water cooling system. The primary customers are the Fleet, program offices, In-Service Engineering agents, and contractors.

9.2.13 Automated Diagnostic Test Generation and Logic Simulation: This capability is used to create test and diagnostic software for digital circuit card Automated Test Equipment and includes real-time digital circuit simulation software. Tests developed via this capability can be exported to the standard Navy Computerized Automated Support System test systems.



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This capability includes three minicomputer systems which run in a normal office environment. The primary customers are local engineers and maintenance personnel.

9.2.14 Environmental Test Facility Systems: Environmental test facilities located at or near NUWC Division, Keyport are used to perform hardware component, system qualification, procurement screening, and special tests. Test conditions include climactic, shock, explosive, acceleration, vibration, temperature, and humidity testing. These capabilities include real-time analog-to-digital data conversion and collection and high-speed digital-to-analog stimulus application equipment. Some equipment, including the explosive and temperature test equipment, is portable. Capability includes more than 20 minicomputers and dedicated high-speed microcomputers used to process and collect test data. Three computer facilities with 1,500 square feet of floor space are utilized. The primary customers are Naval Laboratories, Navy supply activities, and contractors.

9.2.15 Shipboard Electronics System Evaluation Facility: The Shipboard Electronics System Evaluation Facilities (SESEF) are located at Barbers Point, Hawaii, and Point Loma, San Diego, California, and Edix Hook, on the Straits of Juan de Fuca in Washington State. The SESEF provide the fleet units with computerized processed information required to analyze, evaluate, and report the accuracy, quality, and performance of fleet equipment for combat systems readiness. Processed data provides performance measurements of Electronic Surveillance Measures, Antenna Radiation Patterns, Naval Tactical Data Systems, and certification for Tactical Air Navigation and Electronic Warfare Countermeasure systems.

9.2.16 Fleet Operational Readiness Check Site: The Fleet Operational Readiness Check Sites (FORACS) are located at San Clemente Island, California, and Nanakuli, Hawaii. FORACS provides the fleet units with computerized processed information required to analyze, evaluate, and report the accuracy and performance of Fleet equipment for combat systems readiness. Processed data provides performance measurements of Electronic Surveillance Measures Radio Direction Finder, Fire Control Systems, and Sonar Systems. Processed information also provides the test site with automated surface, air, and submarine tracking capabilities.

9.2.17 Post-Operational Analysis, Critique, and Exercise Review (PACER): The PACER Analysis II (PAS II) Systems are five local area networks of 5 to 15 work stations. The PAS II systems provide rapid quantified feedback to help ships, submarines, and aircraft detect and correct sensor, fire control system, procedural, and tactical errors and to understand and use environmental effects on their military capability. The PAS II hosts a unique set of software that can receive data from and analyze all of the Antisubmarine Warfare (ASW) systems in the Navy. The five PAS II thin-line Ethernet cable local area networks have input devices and software to accept, rectify, analyze, and playback digitally recorded mission data from all ASW weapons platforms and ranges. The five PAS II systems receive classified and unclassified data from worldwide Fleet training and test ranges over fiber-optic, microwave,



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and telephone links. The five Pacific and Atlantic area locations support site-specific weapons systems reconstruction and analysis throughout the world. The PAS II supports Fleet Training and Fleet Tactical Development.

### 9.3 Maintenance and Data Handling Computational Capabilities:

9.3.1 Shop and Depot Automation Systems: NUWC Division, Keyport has developed and utilizes several state-of-the-art automation systems to assist shop and depot personnel with the production, maintenance, and repair of various weapons and their components. These systems perform process control by enforcing process flows, generate maintenance records, perform in-shop inventory/configuration tracking, maintain personnel certification records, display procedures on-line, and provide management with current shop statuses and resource management tools. The systems are employed in a variety of computational capabilities, including interactive, distributed, and batch processing; are networked locally and nationally via this Division's local-area and wide-area network capabilities; and provide on-line text, graphics, and video data.

In addition to local use, these systems are deployed throughout the weapon system communities at various Fleet Intermediate Maintenance Activities they provide required information to various contractors, engineers, ISE and TDA personnel, and industrial workers. Examples of these systems include:

- Shop Process Automation System: This client/server based system supports the MK48 and MK48/ADCAP Torpedo programs and the MK30 Mobile Target Program, and it is being deployed in the MK 46 Torpedo Program.
- Engineering Control System: This system supports the MK50 Lightweight Torpedo production, maintenance, and depot facilities.
- Data Gathering System and Computer Aided Process Control System: These systems support the unique requirements of the MK 48/ADCAP Heavyweight Torpedoes and the MK 46 Lightweight Torpedo depots.
- Inventory Configuration Control System: This system provides inventory management support for the MK 46 Torpedo.

9.3.2 Reliability, Maintainability, and Availability (RM&A) Systems: NUWC Division, Keyport developed and operates the primary RM&A databases for all major undersea weapons and mobile targets. These systems provide on-line, real-time information on the MK 48, MK 48/ADCAP, MK 46, and MK 50 Torpedo Programs and the MK 30 Mobile Target Program to local, NUWC, NAVSEA, and Fleet users. These users include program sponsors, Technical Design Agents, engineering personnel, In-Service Engineering Agents, and industrial/contractor personnel at dozens of sites throughout the country.



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These systems, including the major Technical Data Systems and the Maintenance Reporting System, collect, process, store (historical), and distribute reliability, maintenance, logistics, configuration status accounting, performance, and inventory data. The systems used are networked locally and nationally using fiber optics, broadband, and twisted wire; and provide environments for both classified and unclassified data processing and distribution. The systems are located in a modern Keyport computer facility with raised flooring, air conditioning, and backup power capabilities.

9.3.3 Management Control System (MCS): MCS is a production/repair planning and scheduling system that supports the fabrication, repair, and maintenance work performed by many of the weapons programs supported by NUWC Division, Keyport. The computational capability of MCS is used to track inventory, issue material requisitions, issue and track shop process orders, and provide a historical production/repair process audit trail. This capability operates in an environment using interactive terminals distributed throughout the industrial shops via connections to the broadband network. This capability is supported by one minicomputer and is housed in a 7,500 square foot computer room with air conditioning and a raised computer floor. There are limited excess computational and computer room floor space capacities. The primary customers are industrial shop personnel, engineers, and planning and management personnel.

9.3.4 Operation Process Order System (OASys): OASys automates the development of standard shop process orders/instructions and is interfaced to the Management Control System described in paragraph 9.3.3. OASys allows process planners to select standard process templates and generate specific process flows for items to be worked in the production/repair shops. Process routing, procedures, inspections, authorized labor hours, equipment, etc. are identified. This capability operates in an environment using client/server based work stations located throughout the facility via connection to the broadband/Ethernet network. This capability is supported by one mini-computer housed in a central computer facility with air conditioning, Uninterrupted Power Supply support, and a raised computer floor. There are excess computational and computer room floor space capacities. The primary customers are industrial shop process planning personnel.

#### 9.4 Organizational Support Capability:

Modern technologies are employed to support the concept that shared real-time information is an organizational strategic resource. Information supports operational planning and execution, and organizational process improvement. Technologies are emphasized that maximize access to and availability of information throughout organizational levels. These include reliance on open systems computer platforms, interactive fourth generation and graphical based computer languages, and client/server computing. Organizational access to this computational capability is facilitated through the use of state-of-the-art fiber-optic, broadband, twisted pair, and



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microwave network links. The computation capability is supported by the use of three mainframe, 10 mini, and five micro-based computers with a disk storage capacity of 17.5, 66.3, and 7.2 gigabytes, respectively. These facilities utilize a combined floor space of 4,000 square feet.

NUWC Division, Keyport provides support for logistics systems that include, requisitioning, inventory management of material, storeroom operations, receiving, issuing, delivery, procurement, electronic data interchange, and messaging. Corporate direct workload planning, safety, hazardous material tracking, financial management, training, personnel, contractor support, equipment asset tracking, time keeping, range discrepancy reporting, and range test tracking are various business functions supported. Some of the major applications are described below:

9.4.1 Corporate Workload Planning System: The Corporate Workload Planning System provides a standard internal view of direct planned workload for NUWC Division, Keyport's programs. Actual funding received and expended is tracked and measured against the workload plan.

9.4.2 Consolidated Equipment Database: The Consolidated Equipment Database supports the inventory and tracking of minor and plant equipment. It calculates depreciation and aging of plant property, tracks ADP hardware/software, supports the tri-annual inventory process, and supports the reutilization of equipment.

9.4.3 Planned Program Requirements: Planned Program Requirements provides 5-year forecasts for parts purchasing, baseline failure rates, top down baseline assemblies breakdown, stocking levels. The information is used to determine stock levels and procurement of required materials for support of NUWC Division Keyport's intermediate and depot level torpedoes and combat systems.

9.4.4 Ordnance Management System: The Ordnance Management System is the single system of record for management of all accountable conventional ammunition and reportable transactions at Naval Sea Systems Command weapons activities. Transactions are reported to the Naval Ordnance Center, Inventory Management and System's Division, Mechanicsburg, PA, which updates the Conventional Ammunition Inventory Management System on a daily basis.

9.4.5 Range Schedule and Display System: The Range Schedule and Display System tracks range tests runs for all ranges and the assets required for each range test run.

9.4.6 Material Inventory Management System: The Material Inventory Management System safeguards and manages assets of storeroom inventory at selected NUWC Division,



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Keyport sites. It tracks receipts, issues, restoring, financial, shipping documentation, and reports on serialized parts issue of storeroom inventory. The system interfaces with the Automated Material Handling Facility.

9.4.7 Contract Management System: The Contract Management System provides services to support the overall planning, ordering, monitoring, and financial management of NUWC Division, Keyport's major services contracts. It provides automated support to all phases of the contracting life cycle and supports personnel training and certification for contract functions.

9.4.8 Hazardous Material System and Waste Tracking System: The Hazardous Material System and Waste Tracking System provides tracking as required by law for Environmental Protections Control Reporting Agency reporting and by Executive Order.

#### 9.5 Communications and Networking Capabilities:

Network services in place and operational at NUWC Division, Keyport represent an integrated solution to the information management needs of our sponsors, program managers, and systems engineering, logistics support, and fleet customers. The Division's computational facilities are interconnected by secure and non-secure wide-area, regional, and local-area networks that support digital data, voice, and video information delivery. These networks employ conventional as well as state-of-the-art technologies, including fiber optics, satellite, microwave, RF radio, broadband and baseband coaxial cable, and twisted-wire. The computational capabilities and network services existing at this Division serve as focal points at which the regional and national networks interconnecting these customers are joined.

9.5.1 Wide Area Network Communications: NUWC Division, Keyport serves as a regional NAVNET hub, providing access for over 30 local and remote Navy activities to this nationwide fractional-T1 (1.544 Mbps) backbone network. NAVNET provides dedicated point-to-point access between Naval facilities, plus gateway access to the Defense Data Network and Internet services. Dedicated remote links (9.6 kbps to 768 kbps) provide connectivity for specific Keyport program activities and sites, as indicated in the paragraphs preceding. This Division will be extending this wide-area connectivity to local non-Defense entities (local government, schools, and businesses) under Defense Conversion and Dual Use guidelines, as exemplified by the Pacific Northwest Region Computer Aided Acquisition Logistics Support Shared Resource Center now being implemented. NUWC Division, Keyport is also one of five hubs comprising the emerging NAVSEA Enterprise-Wide Network backbone, which will provide T3-speed (44.5 Mbps) service for nearly 60 Navy activities in the western U.S., including Hawaii.



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9.5.2 Regional Data Communications: NUWC Division, Keyport's regional network capability directly supports the daily telecommunication needs of five Navy activities in the Puget Sound area (NUWC Division, Keyport; PSNS in Bremerton; NRMC in Bremerton; PERA/CV in Bremerton; and NAS, Whidbey Island). Keyport also serves as a microwave communications hub, providing the essential link for coordinating and managing our underwater test ranges, including one jointly operated by the U.S. Navy and Canadian Forces. Range data, Test Director voice, and surveillance video are among the data streams carried by this network.

9.5.3 Local Area Network Implementation: NUWC Division, Keyport's personnel designed, installed, and currently maintain local area networks for over 60 customer sites serving approximately 6,000 users. In addition to Keyport, these sites include two Bangor locations, NAVSEA headquarters, three Hawaiian locations, CONUS and OCONUS Weapons Ranges, and nearly a dozen IMA sites. Network monitoring, diagnostic, and configuration management tools are integrated into network designs to better support this nationwide customer base. This Division continues to be a leader within the Navy in pursuing and implementing state-of-the-art network topologies and protocols, and prides itself on its network management and maintenance skills. Evolving now, for example, is this Division's use of Simple Network Management Protocol-based tools, including SunNet Manager software and remote hardware monitors, to examine network health and detect and isolate failures.

9.5.4 Network Services: NUWC Division, Keyport provides 24-hours/day, 7-days/week connectivity through its wide-area, regional, and local-area network connections for its customers. Generally, these networks interconnect computational facilities and services dedicated to specific customer applications. This Division's networks also provide these generic customer services:

- Electronic Messaging: Electronic messaging is provided to NUWC Division, Keyport; its Detachments; NAVSEA sponsors; IMAs; and Test Ranges. This service employs Simple Mail Transfer Protocol; and extends Commercial-Off-The-Shelf mail packages to support X.500 directory services.
- Site-Unique Directory Services: NUWC Division, Keyport has implemented and maintains a directory exchange capability to collect and distribute Electronic Mail address data for all NUWC, NOC, and NSWC activities.
- Office Information Systems: NUWC Division, Keyport is a leader in designing and implementing client/server techniques to support the electronic office. These services include shared and distributed information storage structures, configuration-managed software systems, and the automated processing, formatting, and distribution of production and managerial



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information.

- Video Delivery: Four closed-circuit video channels are maintained to deliver selected satellite, cable, and local video information to NUWC Division, Keyport personnel. Two-way televideo technology is employed to provide training, informational, and test-range-specific display information. In addition to providing ease of information access for users, this capability represents significant cost savings.

- Video Teleconferencing: NUWC Division, Keyport maintains a Video Teleconferencing Center at both Keyport and the Hawaii Detachment, each with full compatibility with other Navy, DOD, and commercial sites. The Keyport VTC supports point-to-point and multipoint continuous presence sessions to accommodate a variety of teleconference formats. Video Teleconferencing offers significant advantages to this Division and its local VTC customers in travel expense savings. It is also used for Master's degree programs in Acoustics and Electronics offered by Pennsylvania State University and Boise State University.

#### 9.6 Defense Conversion and Non-Traditional Computational Capability Initiatives:

9.6.1 JASON Project: The JASON project serves up to 10,000 students per year from the neighboring communities. These students participate interactively with scientists in a real-time satellite broadcast exploring and studying in remote parts of the world. NUWC Division, Keyport provides support services for the local JASON project. The project is supported with a satellite down link connected via broadband local network to the auditorium seating up to 400 students. The 10 ft. by 10 ft. large screen, high resolution display shows real-time video of the scientists as they go about discovering and exploring the subject of interest. Students ask questions directly to the scientists and watch and listen to the replies.

9.6.2 Continuous Acquisition Life-cycle Support Shared Resource Center: The Continuous Acquisition Life-cycle Support Shared Resource Center (CSRC) for the Pacific Northwest Region is set up in close proximity to NUWC Division, Keyport to facilitate technology transfer. The mission of the CSRC is to transfer technical, industrial, and manufacturing technology to small and medium businesses in the region. NUWC Division, Keyport offers a variety of network access topologies for small business use. Engineering data systems, Computer Aided Design, and Electronic Commerce/Electronic Data Interchange resources are available as training resources or for demonstrations of what can be done in an all digital environment.

9.6.3 Cooperative Research and Development Activities: The advanced capabilities of NUWC Division, Keyport are available to small businesses to assist where it would otherwise be cost prohibitive. Special electronic test equipment, plating, environmental testing, technical data systems, and machining centers are used in contributing development resources jointly



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with privately-owned businesses. These initiatives help spawn new local businesses.



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## 10. Mobilization Responsibility and Capability.

a. Describe any mobilization responsibility officially assigned to this site. Cite the document assigning the responsibility.

Documents that assign mobilization responsibilities to NUWC Division, Keyport are:

- OPNAVINST S3061.1D, Navy Capabilities and Mobilization Plan.
- NAVSEA Logistics Support Mobilization Plan, OPR 0341B serial 03/0158 of 8 November 1991 (the replacement document titled Manpower Mobilization Support Plan is under review at NAVSEA.)

These documents require NUWC Division, Keyport to support increased activity as a response to two concurrent Major Regional Crises. Increased activity will be caused by:

- Increased range operations due to weapons testing and Fleet training.
- Reactivation of warshot reserve weapons.
- In-theater support for in-service engineering assigned systems.

To meet mobilization requirements to furnish warshot weapons, NUWC Division, Keyport will provide services in three phases:

- Phase I: To meet the initial wartime surge requirements, this Division has the capability to rapidly finish the refurbishment and upgrade programs (Torpedoes, Fire Control, and Mines) presently in process in this Division's manufacturing, Intermediate Maintenance Activity integration, and testing facilities and to perform the proper Production Acceptance, Test, and Evaluation procedures to supply quality weapons to the Fleet.
- Phase II: The second phase of mobilization will be supported by withdrawing the torpedoes that are in magazine storage and refurbishing, testing, and preparing them for shipment to the Fleet. The depot level repair facilities that are resident at Keyport are essential to this effort. The conventional underwater mines stores at the Hawthorne Detachment will also be refurbished and issued to the Fleet.
- Phase III: To support the reconstitution of the production torpedo pipeline, NUWC Division, Keyport will transfer production tooling, test equipment, procedures, and knowledge retained at this Division to the contractors tasked to build new units to replace those expended in warfare.



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(1) What functional support area(s) does this responsibility support? Refer to Appendix A for the list of functional support areas?

- 1.1 Undersea
- 2.4 Torpedoes
- 2.5 Mines
- 2.9 Fire Control
- 5.1 Sonar Systems
- 7.1 Submarine Communications
- 8.2 Countermeasures
- 10.7 Major Range Development and Operation

(2) What portion of the work years and dollars, as reported in each applicable functional support area reported in Tab A, are spent solely on maintaining your activity's readiness to execute the mobilization responsibilities?

No work years and dollars are spent solely to execute mobilization readiness. Mobilization will cause an increase in intensity and amount of work performed, but not a change in the type of work. Hence, no funding is spent solely to maintain readiness. In the event of mobilization, our shops will go to 10-hour shifts and six-day work weeks, but will continue to turn out the products (torpedoes) that they are doing today. Support is provided to Naval Reservists during their annual training and weekend drills; however, this is minimal and collateral in nature.

(3) How many additional personnel (military & civilian) would be assigned to your activity as part of the mobilization responsibility? Include separately any contractor assets that would be added.

Military Billets. This Division is conducting a Zero-Based Review (ZBR) to validate requirements for mobilization. Although the ZBR is not completed, it is anticipated that approximately 20 to 30 Naval Reserve personnel will be required to meet the surge demands of range operations, torpedo reactivation, and direct Fleet support.

Civilian/Contractor Billets. Based on the Military Personnel Baseline (at Keyport), the number of civilian/contractor billets required to cover the loss of military during mobilization would be approximately 40. These billets would include cooks, administrative support, divers, FMS instructors, etc.



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b. Does your activity have adequate facilities to support your mobilization responsibilities? (yes/no)

Yes

(1) If yes, is any space assigned for the sole purpose of maintaining mobilization readiness? (yes/no) If yes, list the square footage assigned.

n/a

(2) If no, what repairs, renovations and/or additions are required to provide adequate facilities? What is the estimated cost of this work?

n/a

(3) Are there any restrictions that would prevent work (noted in paragraph 10.b.(2) above) from taking place (i.e., AICUZ, environmental constraints, HERO, etc.)? If yes, describe.

No

c. Describe any production facilities that would be activated in case of a future contingency.

n/a

d. Is your activity used as a Reserve Unit mobilization and/or training site?

Yes. NUWC Division Keyport is used as a Reserve Unit mobilization site and a training site for two reserve units. In September 1994, one of these units will no longer be attached to Keyport.



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11. **Range Resources.** Include a copy of the form provided at Tab C of this data call for each range located at this activity or operated by this activity. Also, report ranges at detachments and sites not receiving a separate data call. The following definition of a range will apply:

Range - An instrumented or non-instrumented area that utilizes air, land, and/or water space to support test and evaluation, measurements, training and data collection functions, but is not enclosed within a building.



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**RANGE RESOURCES  
RANGE CAPABILITY FORM**

Technical Center Site	NUWC Division, Keyport Keyport, WA
Range Nomenclature or Title	Northwest Range System

1. List all the ranges that your activity maintains and operates. Provide the following information on each range:

There are three unique, highly instrumented test sites in NUWC Division, Keyport's Northwest Range system, with over 100 square miles of littoral and mid-depth-underwater tracking area, including inshore shallow water sites. While these sites are principally underwater test ranges, they also have extensive surface and in air tracking capability. The sites include Dabob Bay, Nanoose, and Quinault. Water depths, specialized instrumentation, bottom recoverability, acoustic quietness, and security factors facilitate a wide range of Undersea Warfare vehicle and platform tests from Research and Development to production acceptance and Fleet evaluation/exercise. All range sites are linked to the Range Information Display Center at Keyport, where operations can be efficiently viewed, controlled, and analyzed in real time. Complementing the fixed underwater range sites is the Navy's unique land-based test facility. Additional flexibility is provided to customers that require specialized, temporary, underwater tracking at remote locations using deployable range systems. These systems are the Arctic Tracking System and the Transportable Range System.

Fixed Range Sites. The Dabob Bay range site is the quietest and most secure instrumented underwater range in the world. This is especially important in the testing of new, quiet, sensitive technologies which are under development. The Nanoose range site is jointly maintained on a shared basis by the United States and Canada. The Nanoose range has been successfully operated jointly with Canada under a long-term formal International Agreement for over 29 years. Canada also provides extensive range craft support and facilities at no cost to the United States. This site has been identified recently by the Program Executive Officer for Undersea Warfare (PEO(USW)) as "the single most important core facility to PEO(USW)." Likewise, Commodore R. L. Preston, Canadian Director General of Maritime Engineering and Maintenance, recently endorsed the continued requirement for this jointly operated site when he stated, "The Nanoose Range is operationally essential to the mission and viability of the Canadian Maritime Forces." It is also an excellent site for countermeasure testing because of its robust, short-baseline tracking configuration and its capability to track during most countermeasure usage. Both Nanoose and Dabob Bay are utilized extensively for



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development tests based on the capability to recover one-of-a-kind, prototype vehicles intact, even if they sink. To accommodate negatively buoyant vehicles (planned or unplanned), NUWC Division, Keyport maintains and continuously improves several unique underwater recovery systems. The Quinault test site offers the Navy's only fully-instrumented, shallow underwater environment. It meets the NATO 40-meter shallow water requirement and can provide support for the expanding shallow water antisubmarine warfare emphasis, including mine warfare testing and training.

Deployable Range Systems. The Transportable Range System and Arctic Tracking System provide three-dimensional underwater tracking capabilities which are rapidly deployable and designed for littoral and Arctic water testing at sites of interest worldwide.

Additional key features of the Northwest Range System are as follows:

- The Northwest Range sites offer varied littoral water conditions, bottom types, and depths that allow intact recovery of undersea weapons and test data. During the past 25 years over 2,900 torpedoes, mobile targets, and unmanned underwater vehicles with a combined value in excess of \$1.5 billion have been recovered off the sea bottom for reuse and/or critical evaluation.
- The range facilities are modern, well integrated, and synergistic, providing efficient use of resources and personnel. The range sites share the same personnel, range craft, support services, and test and evaluation systems, which are used interchangeably, as needed, to meet the highly varied and complex testing needs of NUWC customers. This results in cost-effective testing and training for NUWC's many weapons program and Fleet customers.
- Keyport maintains strong in-house engineering capabilities for system design, hardware and software development, and continuous improvement of all range systems, based principally on Navy standards and commercial off-the-shelf hardware. This leads to timely, flexible, cost-effective solutions to meet customers needs.
- Full spectrum testing is supported with launch and fire control systems; targets; countermeasures; acoustic measurement systems; weapon retrieval and bottom recovery services; and high accuracy, three-dimensional, above-water and underwater tracking, which is effective even in the presence of acoustic countermeasures. Secure voice and data communications are used at all Northwest Range sites.
- The Range Information Display Center (RIDC) facilitates efficient range operations by minimizing travel to the range sites. Using large screen video and associated monitors, it provides encrypted real-time displays and fusion of range data (tracking, acoustics, and telemetry, plus two-way video and secure communications) from all Northwest Range sites.



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Tests at transportable ranges can also be viewed at the RIDC, as can Underwater Weapon Evaluation Facility tests.

- Modern, multi-function, one-of-a-kind range craft are shared between sites in order to provide best value services to range customers. The principle craft used to support all Northwest Range sites are three 186 foot Yard Torpedo Test (YTT) craft. The YTT's were designed from the keel up to support the highly unique and specialized range requirements at Keyport. The unique feature of these craft is the synergistic integration of multiple range capabilities on a single craft. These features include sea bottom recovery with station keeping capability; dual underwater and triple above water torpedo tubes and associated fire control systems; onboard data recording and control functions for torpedo and unmanned underwater vehicle (UUV) testing; over-the-side launch and recovery systems for unique, high value R&D vehicles, including torpedoes and UUV's, over-the-side stationary targets, countermeasure systems, and acoustic measurement systems. The YTT's also have secure above and below water communication systems. Support craft include one 75 foot Noise Measurement Boat specifically outfitted for stationary target deployment and acoustic measurements, five 73 foot Torpedo Retrieval Boats used for both surface torpedo recovery and towing R&D target and countermeasure systems, and one 120 foot open ocean Torpedo Retriever craft for surface recovery of weapons. Additionally, there are a variety of auxiliary craft, including the Ex-YO 202, which serves as a surface hulk target are available to support range testing. (For additional information, please see Section 6, Craft/Recovery.)

- Acoustic measurement and analysis systems used at the Northwest Range sites are designed to support noise signature acquisition for a variety of undersea weapons, targets, and unmanned underwater vehicles, as well as the complete spectrum of Fleet surface ships and submarines. They include features for high speed and ultra quiet vehicle measurements using directive arrays with adaptive signal processing. The Acoustic Platform for Experiments is a multipurpose mooring system installed at the Dabob Bay site. It is used to haul range systems, including acoustic measurement systems, or test vehicles down to depths as great as four hundred feet and provides a stable, stationary platform for conducting tests. Analysis systems utilize the latest digital signal processing and interactive analysis techniques, multimedia displays, and secure data transmission to customers.

- Keyport develops, operates, and maintains a suite of fixed and mobile undersea target systems in direct support of weapon proofing and Test and Evaluation functions conducted at the Northwest Range sites. Target systems consist of bottom-mounted, ship-deployed, and self-propelled mobile targets.



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1(a). A brief statement of what the range is used for.

These ranges are primarily test tools directly associated with NUWC Division, Keyport's assigned mission, including test and evaluation support of development, operational, production, and in-service programs. Specifically, the Northwest Range System is used for a wide variety of testing and training functions, such as:

- Research and Development; Development, Test, and Evaluation; and Operational Test and Evaluation testing of weapons, ships systems, and unmanned underwater vehicles (UUV's).
- Undersea weapon production acceptance testing (proofing).
- Acoustic measurements of weapons, targets, and UUV's.
- Trident Submarine Post Refit Sea Trials.
- Fleet Undersea Warfare testing and training.
- Ship system testing and evaluation.
- Mine warfare testing and training.
- Magnetic and electric field measurements of submarines and UUV's.
- Special warfare testing and training.
- Exploitation

1(b). Geographic location of the range.

The Northwest Range System is located in the Pacific Northwest near NUWC Division, Keyport's headquarters in Washington State. The range's three fixed test sites are situated at land and sea locations well suited to their particular missions. The Dabob Bay site is in Hood Canal near Submarine Base, Bangor; the Quinault site is approximately 10 miles off the coast of Washington; and the Nanoose site, a joint U.S./Canadian facility, is in the Strait of Georgia near Vancouver Island in British Columbia, Canada. The deployable range systems can be operated at locations worldwide to meet customer requirements. The strategic proximity of the Northwest Range sites to the main industrial center of NUWC Division, Keyport allows easy access to the torpedo and unmanned underwater vehicle preparation and maintenance shops, R&D contractor and engineering representatives, and associated analytical facilities.



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This synergism of range sites to industrial facilities expedites hardware diagnosis and minimizes the time that scarce hardware spends in the pipeline awaiting testing.

1(c). Distance from the range to the activity's headquarters facility (main site).

All Northwest Range sites are located at or within a 125 mile radius of this Division's headquarters in Keyport, Washington. The deployable range systems can be operated at any distance from Keyport. Range tracking data from both the fixed and the deployable sites are encrypted and transmitted in real time to the Range Information Display Center at Keyport for display and analysis.

1(d). Range size in square miles.

The Northwest Range underwater test sites provide approximately 700 square nautical miles of above water tracking area, as well as highly accurate underwater tracking in the areas instrumented with underwater tracking arrays. The total underwater tracking area of the fixed Northwest Range sites is over 100 square nautical miles, which can be modified as needed. The deployable systems can provide extensive additional tracking areas, limited only by the number of sensors deployed.

1(e). Scheduling authority.

All scheduling for Northwest Range System sites is under the authority of NUWC Division, Keyport. Because it is principally focused on weapon RDT&E and production acceptance rather than Fleet training, the Northwest Range System is able to offer very flexible scheduling. This flexibility is mandatory for serving the test needs of unproven vehicles.

1(f). Air space available/restrictions.

The Northwest Range sites all benefit from air spaces which are virtually unrestricted, with a few minor exceptions. The air space over the Nanoose Range is designated as CYD 107, which translates to a Canadian Danger Area. It is activated to an altitude of 3,000 feet continuously when the range is in use and occasionally to 13,500 feet by NOTAM. The Quinault site is located within the confines of Warning Area 237A. Use of this airspace is controlled by the Range Schedules Office at NAS Whidbey Island. Air space control in both the United States and Canada is coordinated with the local air traffic control system for operations involving fixed wing aircraft and helicopters.



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1(g). Maximum water depth available/restrictions.

The Northwest Range sites offers a variety of water depths to meet a wide range of testing and training requirements. Maximum water depths range from 340 feet at the Quinault site to almost 1,300 feet at the Nanoose site. Both the Dabob Bay and the Quinault sites offer excellent littoral water test areas, with a variety of bottom conditions. Dabob Bay, Nanoose, and Quinault ranges are all authorized submarine operating areas.

1(h). Instrumentation capability.

- Underwater Tracking. High-accuracy, three-dimensional underwater tracking is provided at all three primary Northwest Range test sites and also by both of the deployable tracking systems. Tracking pingers in the weapons, vehicles, and ships under test emit coded acoustic signals which are received by arrays of underwater hydrophones and processed at the range tracking centers to produce real-time positional information. High tracking data rates, up to four points per second, facilitate the detailed analyses necessary for complete weapon test and evaluation. A total of 12 objects can be tracked simultaneously at both Dabob Bay and Nanoose. Four underwater objects can be tracked simultaneously at the Quinault site. The ability to time-offset the tracking signals from two test vehicles permits tracking both when they are in very close proximity to each other.

- Above-Water Tracking. A combination of systems, including the Global Positioning System, Mini-Ranger (RF tracking system), Cine-Sextant (optical tracking/digital positioning system), radar, and theodolite above-water tracking systems, are all available to track surface vessels, aircraft, and air-dropped weapons. The Northwest Range is unique among underwater ranges in that its Nanoose site provides the capability to track and/or position fix above-water objects optically in three dimensions. Depending on the range site and installed above water tracking instrumentation, between 14 and 50 above water objects may be tracked or position fixed simultaneously.

- Two-Way Underwater Acoustic Telemetry. All Northwest Range underwater test sites employ acoustic telemetry as part of the standard tracking signals. This allows weapon data to be monitored and recorded at the range tracking center in real time, facilitating both exercise decision making and post-run data analysis. In addition, undersea vehicles can be outfitted with an acoustic telemetry receiver to allow real-time control via commands from the tracking center.



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- Acoustic Measurements. Acoustic measurement and analysis capabilities used at the Northwest Range sites are designed to support noise signature acquisition for a variety of undersea weapons, targets; unmanned underwater vehicles, and naval vessels, including Trident submarines. They include features for high speed and ultra quiet vehicle measurements using directive arrays with adaptive signal processing. Analysis systems utilize the latest digital signal processing and interactive analysis techniques, multimedia displays, and secure data transmission to customers. The available frequency band for acoustic measurements runs from 10 Hz to 200 KHz.

- Electromagnetic Measurements. Electric Field Sensors and the Magnetic Field Sensors, installed at the Dabob Bay site, provide a means to measure low-frequency electric and magnetic fields. These sensors, together with acoustic measurement systems, make Dabob Bay the only Navy range site capable of complete, simultaneous recording and measurement and analysis of the acoustic, electric, and magnetic fields of an underwater vehicle.

- Secure Communications. Secure voice and data communications are used at all Northwest Range sites. All employ two independent UHF radio frequency networks to fully support secure on-range voice communications needs. In addition, the Nanoose and Dabob Range sites utilize a re-transmit facility to improve system performance and increase range area coverage. Secure voice capability is also provided, if required, by secure STU-III cellular telephones. Secure voice, data, and video links between range sites are provided by NUWC owned and maintained microwave links.

- Fixed and Mobile Targets. Stationary, portable, over-the-side, point-source artificial targets are routinely used for the proof, test, and evaluation of underwater weapons such as the MK 46, MK 48, ADCAP, and MK 50 Torpedoes. This instrumentation provides temporal, multiple highlights with echo return. Acoustic targets have been developed as low cost alternatives to the use of actual submarines and surface ships and to provide target support under conditions for which real submarines cannot be used, such as for tests of weapons with warheads. The target systems are both bottom-mounted, to provide all-weather/all-time capability, and boat-deployed to provide flexibility of location and utilization. The systems are capable of exercising all of the Navy's operational torpedoes as well as a variety of T&E vehicles and sonars. The target systems are designed to utilize common support instrumentation and range craft, minimizing range operating costs.

- Submarine Aid-To-Navigation. The real-time acoustic telemetry capabilities of Northwest Range undersea test sites are utilized to provide a submarine Aid-to-Navigation System, which displays real-time numeric and graphic range tracking information aboard submerged submarines. This system is used both as a safety system and for efficient execution of submarine exercises, a significant advantage considering the criticality of submarine schedules.



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- Submarine Terminal Homing Tracking. Keyport's Ship Sensor Tracking (SST) System provides the capability to plot the maneuvers of exercise torpedoes as they interact with target submarines during the terminal homing phase of their runs. This capability is based upon the use of the weapon's own sonar emissions and the submarine's existing sensors, providing an economical method of acquiring important terminal homing data even when the operations are conducted beyond the range boundaries or at open ocean sites. The SST System also provides the capability to track during exercises when acoustic countermeasures are used.

- Submarine Hit Placement Localization. The Hit Placement Localization (HPL) System allows rapid determination of the point of exercise torpedo impact on a target submarine's hull. Using sensors temporarily attached to the hull, the HPL System senses the shock wave created by the torpedo as it hits. This system is used to evaluate the performance of torpedoes, assist the divers in hull surveys, and determine the location of individual impact points during multiple torpedo exercises.

- Close Proximity Tracking For High-Speed Vehicles. The Proximity Measurement System provides an accurate measurement of the closest point of approach, or miss distance, during tests involving two vehicles operating in close proximity to each other or during weapons tests involving high-speed intercepts.

- Real-Time Weapon Data Acquisition and Display. The use of acoustic telemetry provides a means to display real-time test vehicle internal data at the range control site during actual in-water tests.

- Weapon Retrieval. The Northwest Range underwater sites support surface retrieval of weapons and other undersea vehicles using either range support craft or helicopters.

- Bottom Recovery. The Northwest Range System is unique within the Navy in having the only on-site, integrated sea bottom recovery capability. A family of four unique one-of-a-kind recovery systems are available to support the full spectrum of customers' requirements for recovering weapons or unmanned underwater vehicles (UUV's) intact from the sea bottom. Over \$1.5 billion in hardware has been recovered during the past 25 years. One of the systems is capable of removing a weapon that is buried up to 30 feet deep in the sea bottom. The other three systems are utilized for recovering unburied weapons or UUV's from the sea bottom. These systems are also uniquely configured to support maintenance of sea bottom instrumentation and perform sea bottom surveys.



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• Undersea Fiber-Optic Communication. Instrumentation employing fiber-optic communication and using fiber-optic undersea cables are used extensively at Northwest Range sites. Keyport maintains a fully equipped Fiber Optics Laboratory to support range applications. A Fiber-Optic Terminal has been installed near the center of the Nanoose range site to support installation and testing of various customer-provided test systems, avoiding costly installations of fiber-optic shore cables for each application.

• Centralized Range Information Display. The Range Information Display Center (RIDC), located at the main Keyport facility, provides a complete capability to view and replay range operations without traveling to the individual range sites. Secure microwave communication links provide encrypted video, audio, and digital tracking data to the RIDC in real time. This allows engineers and test directors to avoid the cost and time of travel and facilitates rapid evaluation of range exercises.

• Underwater Target Size Measurement. A mechanically directed deployment system for torpedo acoustic transducer arrays provides the capability to actively interrogate underwater targets and record responses to determine acoustic target sizes.

• Underwater Tracking Pingers. NUWC Division, Keyport designs, develops, and provides in-service engineering for all types of underwater tracking transmitters (pingers and shipboard tracking pulsers) used on the Navy's underwater tracking ranges. These pingers provide the coded tracking signals and acoustic telemetry features utilized at the range sites.

• Shallow-Water Tracking. NUWC Division, Keyport's Quinault site is the Navy's only permanent shallow-water underwater tracking range. It provides high-accuracy, three-dimensional tracking over an area of 45 square nautical miles, and provides a vital capability for testing weapons in the littoral water environments required by current threat scenarios.

• Tracking At Remote Littoral Sites. The Transportable Range System provides a rapidly deployable, integrated above-water and three-dimensional underwater tracking capability. It's designed to support littoral water testing at sites of interest worldwide.

• Environmental Measurements. Water sound velocity profiles, conductivity, temperature, and density are routinely measured by either surface craft or bottom-mounted, winch-driven instrumentation. Wind direction and speed, current speed and direction, rain rate, and wave height are also measured and collected as required.

• Under-Ice Tracking. NUWC Division, Keyport's Arctic Submarine Laboratory operates the Navy's only capability for tracking weapons and submarines under the Arctic ice. This range routinely supports Navy and International ice exercise operations.



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• Mine Warfare Support. NUWC Division, Keyport has installed practice minefields at Northwest Range sites to support fleet training and mine countermeasures T&E. The fields are currently in place at the Dabob Bay and Quinault range sites.

• Vehicle Vibration Measurements. Structure borne (vibration) measurement and analysis capabilities are supported at the Northwest Range sites. This includes instrumentation for acquiring, processing, and analyzing the vibration data. Measurements are performed on underwater vehicles and any rotating machinery utilizing the latest signal processing and interactive analysis techniques.

• Real-Time and Three-Dimensional Graphic Displays. Versatile, large-screen, full-color displays provide clear, visual representations of the range exercises as they are being conducted, or selected close-up views, including the objects (ships, targets, weapons, etc.) being tracked, as well as fixed objects of interest.

• Radio Frequency Data Telemetry. The Northwest Range System employs a modern radio frequency telemetry system to support on-range data communications for telemetering of range tracking information, torpedo data, environmental measurements, and navigation data. The telemetry system is a NUWC Division, Keyport design which is in both shipboard and shore environments.

• Underwater Telephone Communication. Underwater telephone communication is supported at all Northwest Range underwater test sites by AN/WQC systems. These systems are also utilized to support acoustic command link communications for mobile target control and shutdown.

• Microwave Links. The NUWC Division, Keyport's digital microwave system is a network of 12 microwave sites located in the Puget Sound and Vancouver, Canada areas. These microwave links are capable of secure or unencrypted voice, video, and/or data communications between Keyport and all instrumented underwater test sites.

1(i). Accuracy of tracking.

The accuracy of the underwater tracking at all Northwest Range sites is typically +/- 6 feet. Above-water tracking accuracies vary from +/- 50 yards for radar systems to +/- 1 foot for theodolite optical systems. Differential Global Positioning System is used for maximum tracking accuracy (+/- 3 feet) using cost-effective commercial (non-military) equipment.



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1(j). Data collection/replay capability.

A wide variety of comprehensive data products are routinely produced by the instrumentation at the Northwest Range sites. In addition to these products, the Range Information Display Center (RIDC) provides real-time monitoring of in-water testing at the several range sites, and provides playback capabilities for detailed analyses of recorded data. Data recorded at the RIDC include video, range communications, graphics plots, and underwater sound. Through secure data links, complete real-time range events can also be projected onto the large display screen at the Naval Undersea Museum. When additional data from the range sites, and that extracted from the vehicles under test, arrive at Keyport, post-processed range data products are generated. These include computer tabulations, plots, strip charts, logs, magnetic tapes, analog data, voice cassette tapes, etc. In addition to hard copy products, data files are accessible on a secure network for interactive analysis.

Acoustic and vibration data from range exercises are processed and merged with range tracking data in a Compact Disk-Read Only Memory (CD-ROM) format for ease of use by range customers for interactive analyses on their office desktop computers. The users can replay the data using a script prepared by the analyst or browse through the data interactively. Keyport is the Navy's principal facility for the processing and analysis of radiated and structure-borne noise from underwater weapons, targets, countermeasures, mines, unmanned undersea vehicles, and other special vehicles.

1(k). What are the maximum hours per year that this range is available to support activities? Provide the actual hours that the range was up and capable of providing services. Do not count "down time" due to maintenance, reconfiguration, or administrative activities (i.e., Holiday shutdowns).

Maximum Available Time	FY 89	FY 90	FY 91	FY 92	FY 93
Totals (All Sites)*	3,354	3,350	4,301	3,782	3,757

\* Dabob Bay, Nanoose, and Quinault

Note: Variations in maximum available hours are due to Fleet schedules, weather, and range maintenance requirements.



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1(l). What were the actual hours this range was utilized per year for the last five years (FYs 1989-1993)?

Actual Hours Utilized	FY 89	FY 90	FY 91	FY 92	FY 93
Totals (All Sites)*	2,403	2,263	3,472	2,720	2,813

\* Dabob Bay, Nanoose, and Quinault

1(m). What were the actual hours that this range was utilized in FY1993?

A total of 2,813 hours were utilized at all sites of the Northwest Range System in FY 1993.

1(n). Who are the customers of the range?

- PEO's and Naval Systems Commands

- PMO 400 AEGIS Program (DRPM)
- PMO 402 MK 48/ADCAP Program (PEO (USW))
- PMO 403 Unmanned Undersea Vehicles Program (PEO (USW))
- PMO 406 Lightweight Torpedo Program (PEO (USW))
- PMO 407 Surface MCM Systems Program (PEO (USW))
- PMO 415 Torpedo Defense Program (PEO (USW))
- PMO 425 Submarine Combat Systems Program (NAVSEA)
- PMO 427 Joint Program Office (Surface Ship Torpedo Defense)
- PMS 380 Foreign Military Sales Program (NAVSEA)
- SEA 06 Weapons and Combat Systems Directorate (NAVSEA)
- SEA 91 Test and Evaluation Program (NAVSEA)
- NAVAIR Naval Air Systems Command (NAVAIR)

- Fleet and Other U.S. Military

- COMNAVAIRPAC Commander Naval Air Forces Pacific
- COMSUBPAC Commander Naval Submarine Forces Pacific
- COMSURFPAC Commander Naval Surface Forces Pacific
- COMOPTEVFOR Commander Operational Test and Evaluation Force
- COMMINTWARCOM Commander Mine Warfare Command
- COMSPECWARCOM Commander Special Warfare Command
- USCG U.S. Coast Guard
- COMTHIRDFLT Commander Third Fleet



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• Foreign Military Sales (FMS)

- Brazil MK 46 Torpedo
- Canada MK 46 and MK 48 Torpedoes
- Egypt MK 37 Torpedo
- Greece MK 46 Torpedo
- Japan MK 46 Torpedo
- Netherlands MK 46 and MK 48 Torpedoes
- Portugal MK 46 Torpedo
- Spain MK 46 Torpedo
- Taiwan MK 46 Torpedo
- Turkey MK 46 Torpedo

• Canadian Forces

- CAF Canadian Armed Forces (Air, Surface, and Submarine)
- CFMETR Canadian Forces Maritime Experimental & Test Ranges

• Laboratories and Miscellaneous

- ARPA Advanced Research Project Administration
- ARL/PSU Applied Research Laboratory / Penn. State University
- ARL/UT Applied Research Laboratory / University of Texas
- APL/JHU Applied Physics Laboratory / Johns Hopkins University
- APL/UW Applied Physics Laboratory / University of Washington
- CSS Coastal Systems Station Panama City
- Customs Customs and Immigration Service
- DEA Drug Enforcement Agency
- DOE Department of Energy
- IUSS Integrated Undersea Surveillance System
- NUWC Newport Naval Undersea Warfare Center Division, Newport Division
- ONI Office of Naval Intelligence
  
- ONR Office of Naval Research
- NRAD NCCOSC Research and Development Center
- AT Alliant Techsystems, Inc.
- SAIC Science Applications International Corporation



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1(o). Of the actual hours utilized what percentage of utilization time was provided to which customers?

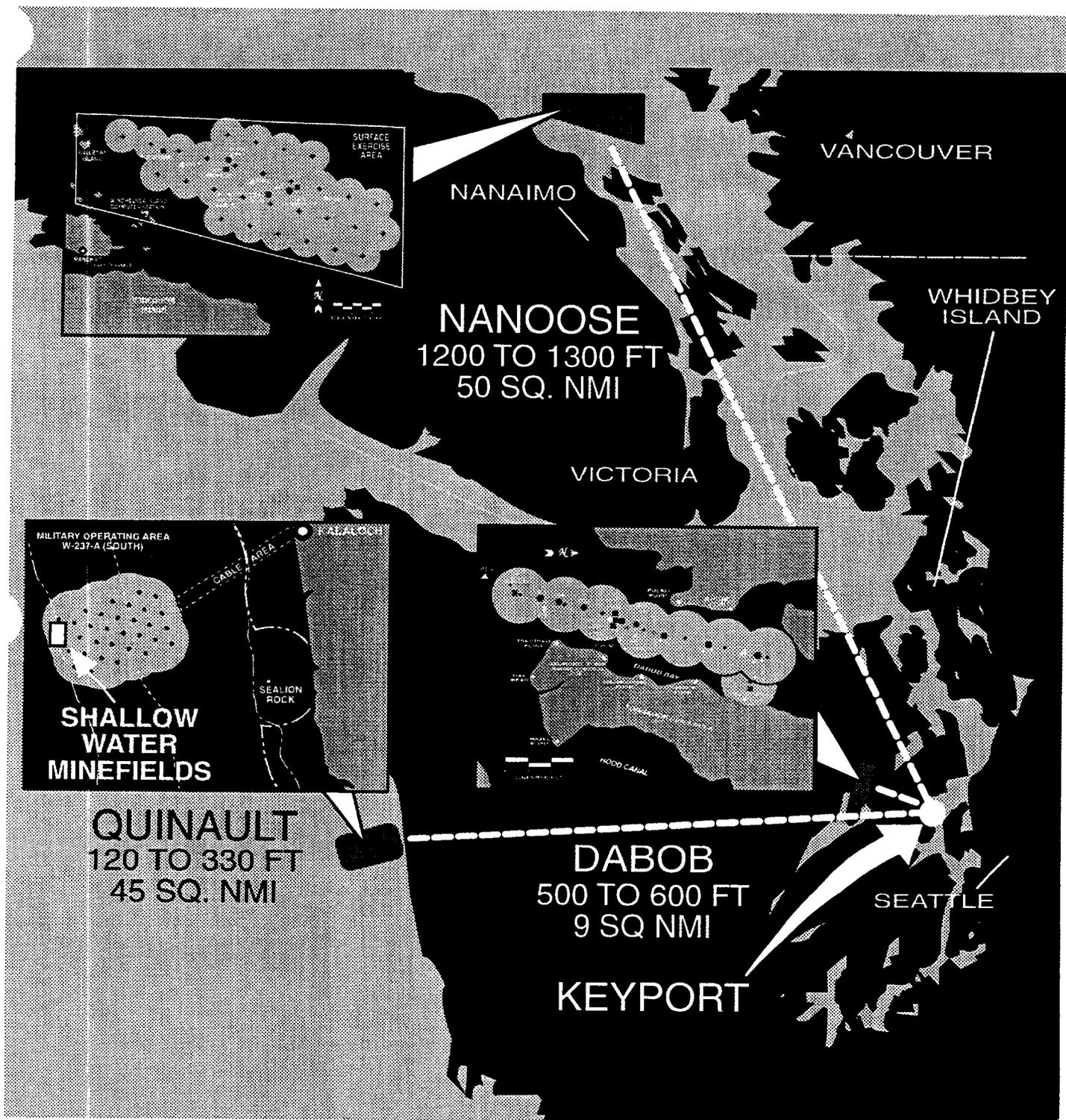
- PEO's and Naval Systems Commands 50 %
- Fleet and Other U.S. Military 18 %
- Foreign Military Sales (FMS) 5 %
- Laboratories/Miscellaneous 27 %

1(p). Provide a sketch, drawing or map of the range:



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2. Are any of your ranges part of the DoD Major Range and Test Facility Base (MRTFB)? (yes/no) If yes, which ones?

The Northwest Range System is not part of the MRTFB. The range is totally customer funded under DBOF.

3. Are there any limiting (current or future) environmental and/or encroachment characteristics that are associated with this range.

The Northwest Range sites are located in established Naval Operating Areas and are not limited by regulatory environmental constraints. The Olympic Coast National Marine Sanctuary regulations specifically allow traditional underwater range operations at the Quinault site. There are no encroachment issues associated with any of the range sites.



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**RANGE RESOURCES  
RANGE CAPABILITY FORM**

Technical Center Site	NUWC Detachment San Diego, CA
Range Nomenclature or Title	SOCAL Range System

1. List all the ranges that your activity maintains and operates. Provide the following information on each range:

The SOCAL Range System consists of one site located at San Clemente Island. The San Clemente Island site consists of the San Clemente Island Underwater Range (SCIUR), Surface Ship Radiated Noise Measurement System (SSRNM), and the Fleet Operational Accuracy Check Site (FORACS).

1(a). A brief statement of what the range is used for.

The SOCAL Range System is used for a wide variety of fleet tests and evaluations, such as:

- Submarine and surface ship sensor calibration.
- Fleet Undersea Warfare (USW) combat system testing and training.
- Acoustic measurements of Fleet ships.
- Submarine and shipboard MK 46 and MK 48 Torpedo exercise weapon firings.

1(b). Geographic location of the range.

The SOCAL Range System is located in the San Diego, California, area. The tests sites are at locations well suited for their particular missions and are in close proximity to fleet operating areas. The SCIUR, FORACS, and SSRNM sites are located on the northeast end of San Clemente Island, 63 nautical miles northwest of San Diego. SCIUR, SSRNM and FORACS are collocated, and share the same operations building, eliminating redundancy of commonly used instrumentation, such as tracking and communication equipment. SCIUR, SSRNM, and FORACS were selected for installation on the northeast end of San Clemente Island due to its near-shore deep water, limited acoustic noise, and protection from the open ocean, allowing accurate calibration of shipboard sensors.

1(c). Distance from the range to the activity's headquarters facility (main site).

All SOCAL Range System sites are located within 70 miles of the NUWC Detachment San



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Diego headquarters.

1(d). Range size in square miles.

The SOCAL Range System sites have the following range sizes:

SCIUR:	40 square miles of underwater tracking.
SSRNM:	100 square miles of above water tracking.
FORACS:	100 square miles of above water tracking.

1(e). Scheduling authority.

All Fleet movements in SOCAL are coordinated by the Fleet Area Control and Surveillance Facility (FACSFAC).

1(f). Air space available/restrictions.

The SOCAL Range System sites benefit from virtually unrestricted airspace. The only restrictions are associated with the Naval Auxiliary Landing Field (NALF) San Clemente Island. When aircraft are taking off or landing from this airfield, the north end of the SCIUR, SSRNM, and FORACS area is restricted in the vicinity of the airfield. The frequency of this restriction is low and has little impact on the conduct of range operations. To preclude aviation safety mishaps, air traffic controllers at NALF San Clemente Island coordinate fixed wing aircraft and helicopter traffic in the area.

1(g). Maximum water depth available/restrictions.

The SOCAL Range sites offers a variety of water depths to meet a wide range of testing and training requirements. Maximum water depth is 3,900 feet off San Clemente Island.

1(h). Instrumentation capability.

- Underwater Tracking. Underwater Tracking is accomplished via installation of an asynchronous Phase Shift Keying pinger on the ship, submarine, or weapon/target requiring tracking. The range tracking system consists of six hydrophones located in a long-baseline configuration. The tracking solution uses a least-square fit of unknowns to minimize the sum of the squares of the measurement residuals. Up to 12 objects can be tracked simultaneously. Data is recorded on 9-track tape to facilitate post-range data reduction and analysis.



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- Acoustic Measurement. Radiated noise measurements consist of directing the ship under test within predetermined closest points of approach to a highly accurate, calibrated, vertical acoustic array. The data is recorded and analyzed against class standards. The intent of this testing is to record the test ship's radiated noise characteristics, determine ship detectability, provide ship's company with training in reducing shipboard noise, and to verify the operability of the ship's Prairie/Masker system, if applicable.

- Above-Water Tracking. A basic capability provided at all SOCAL ranges is above water tracking. The tracking systems used vary, depending on the requirements of the test being conducted. The systems utilized by the SOCAL Range System are a microwave tracking system, Differential Global Positioning System (DGPS), and surveillance radar. The microwave tracking system consists of three fixed tracking stations that provide highly accurate ranging data to a ship equipped with a shipboard transponder. Up to eight objects can be tracked simultaneously with this system. The DGPS consists of a reference GPS receiver located on shore and a remote GPS receiver installed on the ship under test. Reference GPS data is sent to the ship to correct bias/drift associated with GPS equipment. This corrected GPS data is then sent back to the range for incorporation into range computer/graphic systems. The third tracking system utilizes a skin-return radar to provide positional information to an analysis computer. This surveillance radar has a built-in Automatic Radar Plotting Aid (ARPA) which allows the operator to designate up to 20 targets that can be serially transmitted to the analysis computer.

- Acoustic Target Generation System. Provides both active and passive sonar signals to support testing a variety of sonars, including AN/SQS-53A/B/C, AN/SQQ-26CX, AN/BQQ-5, and AN/SQR-19. Active signals can be captured with analog to digital and digital to analog electronics to reproduce incoming signals. Sonars are tested at longer than actual ranges by delaying signals transponded back to the ship under test. The accurately surveyed bottom-mounted Target Generation System consists of three transducers with a combined frequency band of 160 Hz to 30 KHz.

- Electromagnetic Target Generation System. Provides both active and passive radar signals to support testing of the following radar/ESM/gun fire control/RDF equipment: AN/SPS-55, AN/SPS-10, AN/SPS-67, AN/SPS-64, AN/SLQ-32, Mk 92, Mk 86, AN/BLD-1, AN/BRD-7, and AN/WLR-1. Radars are tested at longer than actual ranges through the use of temporal delays. Accurately surveyed antennas provided signals from 30 MHz to 12 GHz.

- Data Analysis System. Acoustic and electromagnetic target generation data is sent to the Data Analysis System to calculate theoretical errors. Following ship tests, shipboard data is entered into the system and calibration errors are determined.



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- Communications. Both secure and clear communications equipment is utilized to provide detailed technical information and coordination for ship tests. Frequency capabilities range from HF to UHF.

- Electronic Countermeasures Test Set. The ship under test is directed to jam radar signals being transmitted by the test site. Range personnel then evaluate the capability of shipboard ECM equipment to jam different threat emitters generated by the range.

1(i). Accuracy of tracking.

Above-Water Tracking:

Microwave Tracking System	+/-	3.3 ft
Surveillance Radar	+/-	100 ft
DGPS	+/-	5 ft

Underwater Tracking	+/-	6 ft
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1(j). Data collection/replay capability.

All SOCAL Range systems collect data to provide reports and/or feedback to our customers. All Range Systems also record data that is subsequently processed and/or analyzed. Replay capability resides in the Range Graphics System which records processed tracking data on disk. The Range Graphics System has the capability to play back tests at various speeds and range scales to provide the customer with expanded test/evaluation capabilities.

1(k). What are the maximum hours per year that this range is available to support activities? Provide the actual hours that the range was up and capable of providing services. Do not count "down time" due to maintenance, reconfiguration, or administrative activities (i.e., Holiday shutdowns).

Maximum Available Time	FY 89	FY 90	FY 91	FY 92	FY 93
Totals (All Sites)*	1,727	1,799	1,593	1,585	1,549

\* SCIUR, SSRNM, and FORACS

Note: Variations in maximum available hours are due to Fleet schedules, weather, and range maintenance requirements.

1(l). What were the actual hours this range was utilized per year for the last five years (FYs



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1989-1993)?

Actual Hours Utilized	FY 89	FY 90	FY 91	FY 92	FY 93
Totals (All Sites)*	1,360	1,636	850	746	735

\* SCIUR, SSRNM, and FORACS

1(m). What were the actual hours that this range was utilized in FY1993?

A total of 735 hours were utilized at all sites of the SOCAL Range System in FY 1993.

1(n). Who are the customers of the range?

- PEO's and Naval Systems Commands
  - SEA 91T Test and Evaluation Program
- Fleet and Other U.S. Military
  - CINCPACFLT Commander in Chief Pacific Fleet
  - COMSUBPAC Commander Naval Submarine Forces Pacific
  - COMNAVAIRPAC Commander Naval Air Forces Pacific
  - COMSURFPAC Commander Naval Surface Forces Pacific

1(o). Of the actual hours utilized what percentage of utilization time was provided to which customers?

- PEO's and Naval Systems Commands 25%
- Fleet and Other U.S. Military 75%

1(p). Provide a sketch, drawing or map of the range.



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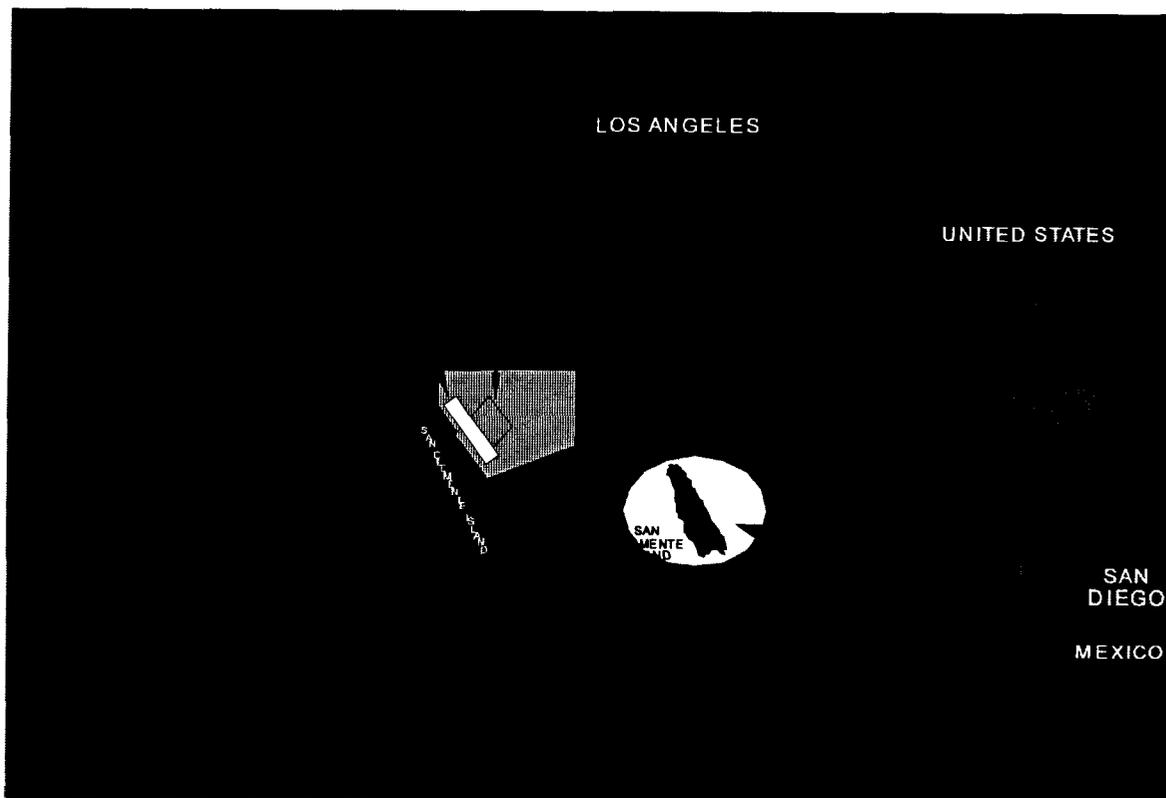
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## SOCAL RANGE SYSTEM



2. Are any of your ranges part of the DoD Major Range and Test Facility Base (MRTFB)? (yes/no) If yes, which ones?

The SOCAL Range System is not part of the MRTFB. The range is totally customer funded under DBOF.

3. Are there any limiting (current or future) environmental and/or encroachment characteristics that are associated with this range.

The SOCAL Range sites are located in established Naval Operating Areas and are not limited by regulatory environmental constraints. There are no encroachment issues associated with any of the range sites.



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NUWC DIV KEYPORT

**RANGE RESOURCES  
RANGE CAPABILITY FORM**

Technical Center Site	NUWC Detachment Lualualei, Hawaii
Range Nomenclature or Title	MIDPAC Range System

1. List all the ranges that your activity maintains and operates. Provide the following information on each range:

The MIDPAC Range System consists of the Hawaiian Island Underwater Range (HAIUR), Fleet Operational Readiness Accuracy Check Site III (FORACS III), and Surface Ship Radiated Noise Measurement (SSRNM) test facilities. This Range system provides specialized fleet test support services primarily for Fleet and NAVSEA sponsored programs.

1(a). A brief statement of what the range is used for.

The MIDPAC Range system is used for a wide variety of fleet tests and evaluations, such as:

- Submarine and surface ship sensor calibration.
- Fleet Undersea Warfare (USW) combat system testing and training.
- Acoustic measurements for fleet ships.
- Shallow water minefield exercises.

1(b). Geographic location of the range.

The MIDPAC Range System is located on the western leeward coast of the Island of Oahu, Hawaii, within 20 nautical miles northwest of Pearl Harbor, homeport for submarines and surface combatants, and is near NAS Barbers Point, homebase for P-3 aircraft. The test sites are at locations well suited for their particular missions and are in close proximity to fleet operating areas. HAIUR, SSRNM, and FORACS are collocated, sharing the same operations building, and eliminating redundancy of commonly used instrumentation, such as tracking and communication equipment.

1(c). Distance from the range to the activity's headquarters facility (main site).

All MIDPAC Range Sites are located within 10 miles of NUWC Detachment Hawaii headquarters at Lualualei, Hawaii.



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1(d). Range size in square miles.

The MIDPAC Range System sites have the following range sizes:

HAIUR:	25 square miles of underwater tracking.
SSRNM:	25 square miles of above water tracking.
FORACS:	25 square miles of above water tracking.

1(e). Scheduling authority.

All scheduling for the MIDPAC Range System is under the authority of NUWC Detachment Hawaii.

1(f). Air space available/restrictions.

The air spaces of the MIDPAC Range sites are restricted for fixed-wing aircraft due to the proximity of Honolulu International Airport and Naval Air Station Barbers Point. However, this restriction has little or no impact on conducting range operations. Air space control in Hawaii is coordinated with the local air traffic control system for operations involving fixed-wing aircraft and helicopters.

1(g). Maximum water depth available/restrictions.

The MIDPAC Range sites offer a variety of water depths to meet a wide range of testing and training requirements. Maximum water depth is 3,600 feet at the FORACS site.

1(h). Instrumentation capability.

- Underwater Tracking. HAIUR is instrumented with a long-baseline, asynchronous acoustic tracking system capable of tracking up to four objects simultaneously. It consists of five underwater hydrophones situated in 2,500 ft to 3,500 ft depths. The MK 84 pinger is utilized to conduct acoustic tracking exercises. An underwater telephone system (UQC) provides underwater communications.

- Acoustic Measurement. Radiated noise measurements consist of directing the ship under test within predetermined closest points of approach to a highly accurate, calibrated, vertical acoustic array. The data is recorded and analyzed against class standards. The intent of the test is to record the test ship's radiated noise characteristics, determine ship detectability, provide ship's company with training to reduce ship's noise, and to verify shipboard Prairie/Masker system operability, if applicable.



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• Above-Water Tracking. The Hawaiian Island Underwater Range is instrumented with an optical tracking system and an automatic RF tracking system. The optical tracking system utilizes digital theodolites operated by personnel in the shoreside tracking towers. The Automated Position Tracking System is an automatic RF tracking system with equipment in the shoreside tracking towers and on the test unit.

• Acoustic Target Generation System. This system provides both active and passive sonar signals to support testing of a variety of sonars, including AN/SQS-53A/B/C, AN/BQQ-5, AN/SQR-19, AN/SQS-56, and AN/AQS-13. Active signals can be captured with analog to digital and digital to analog converters to reproduce incoming signals. Sonars are tested at longer than actual ranges by delaying signals transponded back to the ship under test. The accurately surveyed bottom-mounted Target Generation System consists of two transducers with a combined frequency band of 160 Hz to 30KHz.

• Electromagnetic Target Generation System. This system provides both active and passive radar signals to support testing of the following radar/ESM/gun fire control/RDF equipment: AN/SPS-55, AN/SPS-10, AN/SPS-67, AN/SPS-64, AN/SLQ-32, Mk 92, Mk 86, AN/BLD-1, AN/WLQ-4, AN/BRD-7, and AN/WLR-1. Radars are tested at longer than actual ranges through the use of temporal delays. Highly accurately surveyed antennas provided signals from 30 MHz to 12 GHz.

• Communications. Communication instrumentation verifies the operational performance of both secure and clear equipment and verifies the proper operation of all transmission modes under typical fleet conditions from HF to UHF.

• Electronic Countermeasure Instrumentation. Electronic Countermeasures (ECM) instrumentation verifies the operational capability of shipboard equipment to effectively counter different threat emitters.

1(i). Accuracy of tracking.

Above Water Tracking:

FORACS +/- 3 feet position  
+/- 0.02 degrees heading

Underwater Tracking:

HAIUR +/- 6 feet position



**ADMINISTRATIVE SENSITIVE**

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1(j). Data collection/replay capability.

FORACS tracking and test data are gathered and processed on a HP-9020 computer. Underwater tracking data is collected and processed on a MicroVax computer. Replay capability resides in the range computer system which records processed tracking data on disk. The system has the capability to play back at various speeds and range scales to provide customers with enhanced test and evaluation capabilities.

1(k). What are the maximum hours per year that this range is available to support activities? Provide the actual hours that the range was up and capable of providing services. Do not count "down time" due to maintenance, reconfiguration, or administrative activities (i.e., Holiday shutdowns).

Maximum Available Time	FY 89	FY 90	FY 91	FY 92	FY 93
Totals (All Sites)*	1,876	1,891	1,828	1,822	1,770

\* FORACS, HAIUR, and SSRNM

Note: Variations in maximum available hours are due to Fleet schedules, weather, and range maintenance requirements.

1(l). What were the actual hours this range was utilized per year for the last five years (FYs 1989-1993)?

Actual Hours Utilized	FY 89	FY 90	FY 91	FY 92	FY 93
Totals (All Sites)*	920	774	726	581	533

\* FORACS, HAIUR, and SSRNM

1(m). What were the actual hours that this range was utilized in FY1993?

A total of 533 hours were utilized at all sites of the MIDPAC Range System in FY 1993.

1(n). Who are the customers of the range?

- DRPM and Naval Systems Commands
  - SEA 91T Test and Evaluation Program
  - PHNS Pearl Harbor Naval Shipyard



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- Fleet and Other U.S. Military
  - CINCPACFLT Commander in Chief Pacific Fleet
  - COMSUBPAC Commander Naval Submarine Forces Pacific
  - COMNAVSURFPAC Commander Naval Surface Forces Pacific
  - COMNAVAIRPAC Commander Naval Air Forces Pacific
  - USMC United States Marine Corps
  - USCG United States Coast Guard
  
- Foreign Military Sales
  - Korea Shipboard Sensor Tests
  - Australia Shipboard Sensor Tests
  - Japan Shipboard Sensor Tests

1(o). Of the actual hours utilized what percentage of utilization time was provided to which customers?

- Fleet 67%
- NAVSEA 25%
- FMS 8%

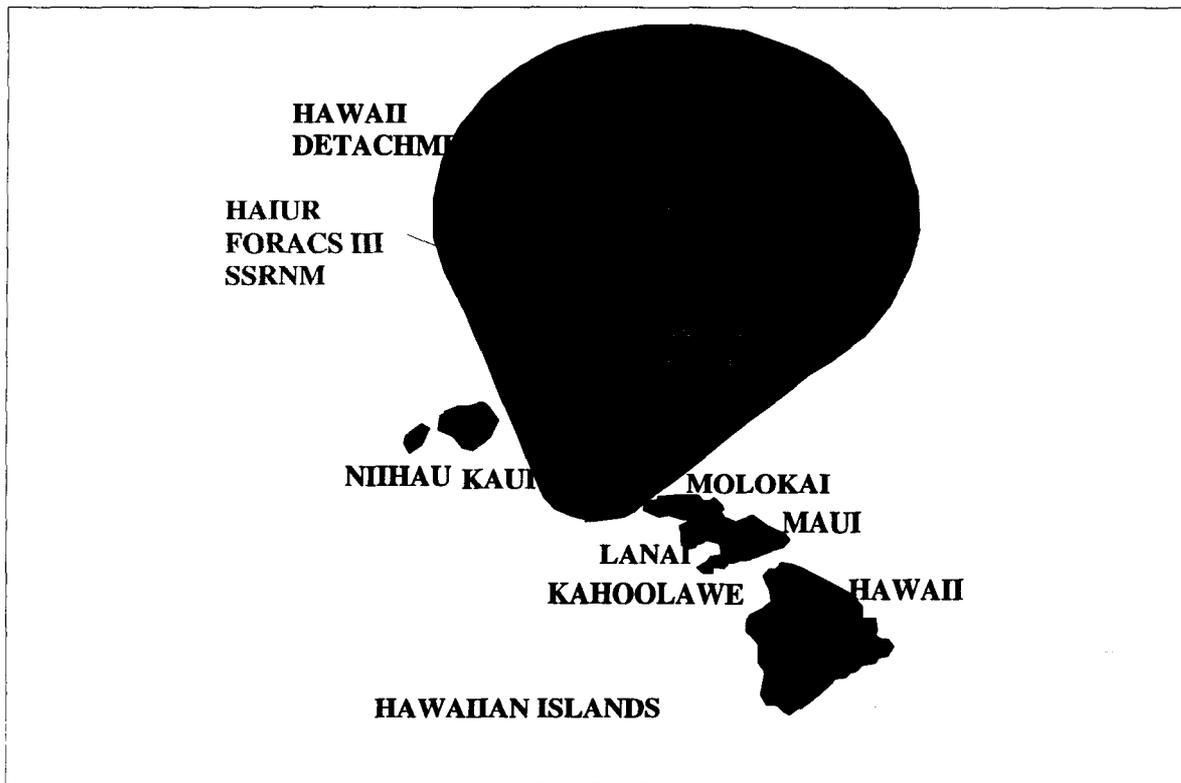
1(p). Provide a sketch, drawing or map of the range.



**ADMINISTRATIVE SENSITIVE**

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## MIDPAC RANGE SYSTEM



2. Are any of your ranges part of the DoD Major Range and Test Facility Base (MRTFB)? (yes/no) If yes, which ones?

The MIDPAC Range System is not part of the MRTFB. The range is totally customer funded under DBOF.

3. Are there any limiting (current or future) environmental and/or encroachment characteristics that are associated with this range.

The MIDPAC Range System is located in an established Naval Operating Area and is not limited by regulatory environmental constraints. There are no encroachment issues associated with any of the range sites.



**ADMINISTRATIVE SENSITIVE**

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NUWC DIV KEYPORT

## QUALITY OF LIFE

The Quality of Life at NUWC Division, Keyport, as addressed in the questions that follow, is greatly enhanced for both military and civilian personnel by the beauty of the surrounding natural environment and the quality of the organization. NUWC Division, Keyport's concern for its environment and its commitment to quality have both been nationally recognized.

In 1993, The Secretary of the Navy awarded the first-ever Navy Meritorious Unit Commendation for Environmental Achievement to NUWC Division, Keyport. All military and civilian personnel shared in this commendation, and each person was awarded a military ribbon or pin in recognition of their achievement.

As the Navy's only Finalist and Winner of the Federal Quality Institute's prestigious 1994 National Quality Improvement Prototype Award, NUWC Division, Keyport is widely recognized as an organization that is among the very best in government. This has a significant impact on the quality of life for military and civilian personnel alike. In a recent ceremony recognizing this Division's achievement, the Honorable John H. Dalton, Secretary of the Navy, said, "Your selection as a Winner for a first time applicant is unusual in the history of this award and is a credit to your people...the men and women who made this happen, both civilian and military...I congratulate you on a job extremely well done and an award that is very well deserved!"



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
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UIC N00253  
NUWC DIV KEYPORT

**12. Military Housing**

(a) Family Housing:

(1) Do you have mandatory assignment to on-base housing? (circle) yes **no**

(2) For military family housing in your locale provide the following information:

Type of Quarters	Number of Bedrooms	Total number of units	Number Adequate	Number Substandard	Number Inadequate
Officer	4+	36	36	0	0
Officer	3	45	45	0	0
Officer	1 or 2	36	36	0	0
Enlisted	4+	73	73	0	0
Enlisted	3	260	260	0	0
Enlisted	1 or 2	415	415	0	0
Mobile Homes	0	0	0	0	0
Mobile Home lots	0	0	0	0	0

(3) In accordance with NAVFACINST 11010.44E, an inadequate facility cannot be made adequate for its present use through "economically justifiable means". For all the categories above where inadequate facilities are identified provide the following information:

- a. Facility type/code:
- b. What makes it inadequate?
- c. What use is being made of the facility?
- d. What is the cost to upgrade the facility to substandard?
- e. What other use could be made of the facility and at what cost?
- f. Current improvement plans and programmed funding:
- g. Has this facility condition resulted in C3 or C4 designation on your BASEREP?

n/a



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
 12-2  
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(4) Complete the following table for the military housing waiting list.

Pay Grade	Number of Bedrooms	Number on List <sup>1</sup>	Average Wait
O-6/7/8/9	1	N/A	N/A
	2	N/A	N/A
	3	N/A	N/A
	4+	1	6 Mos
O-4/5	1	N/A	N/A
	2	N/A	N/A
	3	8	6 - 8 Mos
	4+	2	6 - 8 Mos
O-1/2/3/CWO	1	N/A	N/A
	2	37	3 - 6 Mos
	3	9	3 - 6 Mos
	4+	1	3 - 6 Mos
E7-E9	1	N/A	N/A
	2	11	18 - 24 Mos
	3	72	12 - 16 Mos
	4+	30	12 - 16 Mos
E1-E6	1	N/A	N/A
	2	890	18 - 24 Mos
	3	171	12 - 16 Mos
	4+	49	12 - 16 Mos

<sup>1</sup>As of 31 March 1994.



**ADMINISTRATIVE SENSITIVE**

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12-3  
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(5) What do you consider to be the top five factors driving the demand for base housing? Does it vary by grade category? If so provide details.

Top Five Factors Driving the Demand for Base Housing	
1	High Quality of Housing and Neighborhoods
2	Support of other Navy Families
3	Location of Base Housing close to Work
4	Security for the family
5	Nearness of Navy Exchange, Commissary, Recreational, and Medical Facilities

(6) What percent of your family housing units have all the amenities required by "The Facility Planning & Design Guide" (Military Handbook 1190 & Military Handbook 1035-Family Housing)?

Every unit meets the requirements of the referenced guide.

(7) Provide the utilization rate for family housing for FY 1993.

Type of Quarters	Utilization Rate
Adequate	98%
Substandard	N/A
Inadequate	N/A

(8) As of 31 March 1994, have you experienced much of a change since FY 1993? If so, why? If occupancy is under 98% ( or vacancy over 2%), is there a reason?

There has been no change since 1993.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
12-4  
UIC N00253  
NUWC DIV KEYPORT

(b) BEQ:

(1) Provide the utilization rate for BEQs for FY 1993.

Type of Quarters	Utilization Rate
Adequate	88%
Substandard	N/A
Inadequate	N/A

(2) As of 31 March 1994, have you experienced much of a change since FY 1993? If so, why? If occupancy is under 95% (or vacancy over 5%), is there a reason?

There as been no change since 1993. The occupancy is under 95% because a high percentage of the sailors attached to this command are married and are living with their families.

(3) Calculate the Average on Board (AOB) for geographic bachelors as follows:

$$\text{AOB} = \frac{(\# \text{ Geographic Bachelors} \times \text{average number of days in barracks})}{365}$$

$$\text{AOB} = 2 = (2 \times 365)/365$$

(4) Indicate in the following chart the percentage of geographic bachelors (GB) by category of reasons for family separation. Provide comments as necessary.

Reason for Separation from Family	Number of GB	Percent of GB	Comments
Family Commitments (children in school, financial, etc.)	2	100%	
Spouse Employment (non-military)	0	0	
Other	0	0	
<b>TOTAL</b>	<b>2</b>	<b>100%</b>	



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
12-5  
UIC N00253  
NUWC DIV KEYPORT

(5) How many geographic bachelors do not live on base?

We have no geographic bachelors at this time who do not live on base.

(c) BOQ:

(1) Provide the utilization rate for BOQs for FY 1993.

Type of Quarters	Utilization Rate
Adequate	N/A
Substandard	N/A
Inadequate	N/A

(2) As of 31 March 1994, have you experienced much of a change since FY 1993? If so, why? If occupancy is under 95% (or vacancy over 5%), is there a reason?

n/a

(3) Calculate the Average on Board (AOB) for geographic bachelors as follows:

$$\text{AOB} = \frac{(\# \text{ Geographic Bachelors } \times \text{ average number of days in barracks})}{365}$$

n/a



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
12-6  
UIC N00253  
NUWC DIV KEYPORT

(4) Indicate in the following chart the percentage of geographic bachelors (GB) by category of reasons for family separation. Provide comments as necessary.

Reason for Separation from Family	Number of GB	Percent of GB	Comments
Family Commitments (children in school, financial, etc.)	0	0	
Spouse Employment (non-military)	0	0	
Other	0	0	
<b>TOTAL</b>	<b>0</b>	<b>100</b>	

(5) How many geographic bachelors do not live on base?

We have no geographic bachelors at this time.

(d) BOQ/BEQ Housing and Messing.

(1) Provide data on the BOQs and BEQs assigned to your current plant account. The desired unit of measure for this capacity is people housed. Use CCN to differentiate between pay grades, i.e., E1-E4, E5-E6, E7-E9, CWO-O2, O3 and above.

Facility Type, Bldg. # & CCN	Total No. of Beds	Total No. of Rooms	Adequate		Substandard		Inadequate	
			Beds	Sq Ft	Beds	Sq Ft	Beds	Sq Ft
BEQ Bldg 35 721-11	68	31	68	15,543	0	0	0	0
BEQ Bldg 35 721-12	2	2	2	457	0	0	0	0
BEQ Bldg 515 721-11	28	14	28	5,407	0	0	0	0
BEQ Bldg 515 721-12	6	6	6	2,318	0	0	0	0



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
12-7  
UIC N00253  
NUWC DIV KEYPORT

(2) In accordance with NAVFACINST 11010.44E, an inadequate facility cannot be made adequate for its present use through "economically justifiable means". For all the categories above where inadequate facilities are identified provide the following information:

- a. Facility type/code:
- b. What makes it inadequate?
- c. What use is being made of the facility?
- d. What is the cost to upgrade the facility to substandard?
- e. What other use could be made of the facility and at what cost?
- f. Current improvement plans and programmed funding:
- g. Has this facility condition resulted in C3 or C4 designation on your BASEREP?

n/a

(3) Provide data on the BOQs and BEQs projected to be assigned to your plant account in FY 1997. The desired unit of measure for this capacity is people housed. Use CCN to differentiate between pay grades, i.e., E1-E4, E5-E6, E7-E9, CWO-O2, O3 and above.

Facility Type, Bldg. # & CCN	Total No. of Beds	Total No. of Rooms	Adequate		Substandard		Inadequate	
			Beds	Sq Ft	Beds	Sq Ft	Beds	Sq Ft
See note								

Note: No new facilities are projected to be assigned. Current facilities are adequate to meet projected mission requirements.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
12-8  
UIC N00253  
NUWC DIV KEYPORT

(4) In accordance with NAVFACINST 11010.44E, an inadequate facility cannot be made adequate for its present use through "economically justifiable means". For all the categories above where inadequate facilities are identified provide the following information:

- a. Facility type/code:
- b. What makes it inadequate?
- c. What use is being made of the facility?
- d. What is the cost to upgrade the facility to substandard?
- e. What other use could be made of the facility and at what cost?
- f. Current improvement plans and programmed funding:
- g. Has this facility condition resulted in C3 or C4 designation on your BASEREP?

n/a

(5) Provide data on the messing facilities assigned to your current plant account.

Facility Type, CCN and Bldg. #	Total Sq. Ft.	Adequate		Substandard		Inadequate		Avg # Noon Meals Served
		Seats	Sq Ft	Seats	Sq Ft	Seats	Sq Ft	
Dining Facility 721-45 Bldg 35	7,322	76	7,322	0	0	0	0	68

(6) In accordance with NAVFACINST 11010.44E, an inadequate facility cannot be made adequate for its present use through "economically justifiable means". For all the categories above where inadequate facilities are identified provide the following information:

- a. Facility type/code:
- b. What makes it inadequate?
- c. What use is being made of the facility?
- d. What is the cost to upgrade the facility to substandard?
- e. What other use could be made of the facility and at what cost?
- f. Current improvement plans and programmed funding:
- g. Has this facility condition resulted in C3 or C4 designation on your BASEREP?

n/a



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
12-9  
UIC N00253  
NUWC DIV KEYPORT

(7) Provide data on the messing facilities projected to be assigned to your plant account in FY 1997.

Facility Type, CCN and Bldg. #	Total Sq. Ft.	Adequate		Substandard		Inadequate		Avg # Noon Meals Served
		Seats	Sq Ft	Seats	Sq Ft	Seats	Sq Ft	
See note								

Note: No new facilities are projected to be assigned. Current facilities are adequate to meet projected mission requirements.

(8) In accordance with NAVFACINST 11010.44E, an inadequate facility cannot be made adequate for its present use through "economically justifiable means". For all the categories above where inadequate facilities are identified provide the following information:

- a. Facility type/code:
- b. What makes it inadequate?
- c. What use is being made of the facility?
- d. What is the cost to upgrade the facility to substandard?
- e. What other use could be made of the facility and at what cost?
- f. Current improvement plans and programmed funding:
- g. Has this facility condition resulted in C3 or C4 designation on your BASEREP?

n/a



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
12-10  
UIC N00253  
NUWC DIV KEYPORT

13. **MWR Facilities.** For on-base MWR facilities<sup>2</sup> available, complete the following table for each separate location. For off-base government owned or leased recreation facilities indicate distance from base. If there are any facilities not listed, include them at the bottom of the table.

**NUWC Division, Keyport,** **0 Miles**  
**Naval Submarine Base, Bangor and** **6 Miles**  
**LOCATION Puget Sound Naval Shipyard, Bremerton** **DISTANCE 13 Miles**

Facility	Unit of Measure	Total	Profitable (Y,N,N/A)	Location/Miles
Auto Hobby	Indoor Bays	3	Y	Keyport/0 miles
		8	N	Bangor/6 miles
13		Y	PSNS/13 miles	
	Outdoor Bays	3	N	Bangor/6 miles
Arts/Crafts	SF	1,200	N	Bangor/6 miles
Wood Hobby	SF	820	Y	Keyport/0 miles
Bowling	Lanes	16	Y	Bangor/6 miles
		18	Y	PSNS/13 miles
Enlisted Club	SF	4,916	Y	Bangor/6 miles
Officer's Club	SF	2,216	N	Bangor/6 miles
Library	SF	7,296	N/A	Keyport/0 miles
		10,045	N/A	Bangor/6 miles
Library	Books	9,600	N/A	Keyport/0 miles
		20,000+	N/A	Bangor/6 miles
Theater	Seats	495	Y	Bangor/6 miles
ITT	SF	900	Y	Bangor/6 miles
Museum/Memorial	SF	52,524	N/A	Keyport/0 miles
Pool (indoor)	Lanes	10	N	Bangor/6 miles

<sup>2</sup>Spaces designed for a particular use. A single building might contain several facilities, each of which should be listed separately.



**ADMINISTRATIVE SENSITIVE**

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Facility	Unit of Measure	Total	Profitable (Y,N,N/A)	Location/Miles
Pool (outdoors)	Lanes	N/A	N/A	N/A
Beach	LF	1,000	N/A	Bangor/6 miles
Swimming Ponds	Each	0	N/A	N/A
Tennis CT	Each	3 8 7	N/A N/A N/A	Keyport/0 miles Bangor/6 miles PSNS/13 miles
Volleyball CT (outdoor)	Each	2 1	N/A N/A	Keyport/0 miles PSNS/13 miles
Basketball CT (outdoor)	Each	1 1 <sup>1</sup> 1	N/A N/A N/A	Keyport/0 miles Bangor/6 miles PSNS/13 miles
Racquetball CT	Each	1 7 2	Y N Y	Keyport/0 miles Bangor/6 miles PSNS/13 miles
Golf Course	Holes	0	N/A	N/A
Driving Range	Tee Boxes	0	N/A	N/A
Gymnasium	SF	8,174 10,400 <sup>2</sup>	Y N	Keyport/0 miles Bangor/6 miles
Fitness Center	SF	800 4,400 800	Y N Y	Keyport/0 miles Bangor/6 miles PSNS/13 miles
Marina	Berths	0	N/A	N/A
Stables	Stalls	0	N/A	N/A
Softball Fld	Each	1 5 3	Y N N	Keyport/0 miles Bangor/6 miles PSNS/13 miles
Football Fld	Each	1 1 1	N N N	Keyport/0 miles Bangor/6 miles PSNS/13 miles



ADMINISTRATIVE SENSITIVE

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13-2  
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Facility	Unit of Measure	Total	Profitable (Y,N,N/A)	Location/Miles
Soccer Fld	Each	1	N	Keyport/0 miles
		1	N	Bangor/6 miles
		1	N	PSNS/13 miles
Youth Center	SF	4,220	N/A	Keyport/0 miles
		3,500	N <sup>3</sup>	Bangor/6 miles
Recreation Center	Each	1	Y	Keyport/0 miles
Boat Storage Facility	SF	1,250	Y	Keyport/0 miles
Outdoor Lakes	Each	1	N/A	Keyport/0 miles
		3	N/A	Bangor/6 miles
Outdoor Equipment Issue	SF	4,200	Y	Bangor/6 miles
RV Storage	Stalls	95	Y	Bangor/6 miles
Car Wash	Stalls	4	Y	Bangor/6 miles
Fleet Recreation Center	SF	1,000	N	Bangor/6 miles
Veterinarian Clinic	SF	700	Y	Bangor/6 miles
Litehouse Youth Center	SF	7,970	Y <sup>4</sup>	Bangor/6 miles

<sup>1</sup> Outdoor Court is covered with vinyl dome structure.

<sup>2</sup> Includes (2) different facilities.

<sup>3</sup> Does not include before and after school care facility.

<sup>4</sup> Does include before and after school care facility.

(a) Is your library part of a regional inter-library loan program?

No. However, all books are available to all military and civilian personnel and some 6,100 books are available to the general public for reference and research of Naval Undersea studies at Building 1016, the Naval Undersea Museum.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5

13-3

UIC N00253

NUWC DIV KEYPORT

**14. Base Family Support Facilities and Programs.**

a. Complete the following table on the availability of child care in a child care center on your base.

Age Category	Capacity (Children)	SF			Number on Wait List	Average Wait (Days)
		Adequate	Substandard	Inadequate		
0-6 Mos	15	900	0	0	47	6 mos - 1 yr
6-12 Mos	15	525	0	0	47	6 mos - 1 yr
12-24 Mos	20	700	0	0	21	6 mos - 1 yr
24-36 Mos	28	980	0	0	23	6 mos - 1 yr
3-5 Yrs	22	770	0	0	47	3 - 4 mos

Note: Facility is located at Naval Submarine Base, Bangor (6 miles from Keyport).

b. In accordance with NAVFACINST 11010.44E, an inadequate facility cannot be made adequate for its present use through "economically justifiable means." For all the categories above where inadequate facilities are identified provide the following information:

Facility type/code:

What makes it inadequate?

What use is being made of the facility?

What is the cost to upgrade the facility to substandard?

What other use could be made of the facility and at what cost?

Current improvement plans and programmed funding:

Has this facility condition resulted in C3 or C4 designation on your BASEREP?

n/a

c. If you have a waiting list, describe what programs or facilities other than those sponsored by your command are available to accommodate those on the list.

Waiting lists are managed by Naval Submarine Base, Bangor.

d. How many "certified home care providers" are registered at your base?

There are 2 certified home care providers registered at this base, and 16 at Naval Submarine Base, Bangor.



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5

14-1

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NUWC DIV KEYPORT

e. Are there other military child care facilities within 30 minutes of the base? State owner and capacity (i.e., 60 children, 0-5 yrs).

Military child care facilities are available at Naval Submarine Base, Bangor on a space available basis. See table in part (a) above.

f. Complete the following table for services available on your base. If you have any services not listed, include them at the bottom.

Service	Unit of Measure	Qty
Exchange <sup>1</sup>	SF	2,400
Gas Station*	SF	0
Auto Repair*	SF	0
Auto Parts Store*	SF	0
Commissary*	SF	0
Mini-Mart <sup>1</sup>	SF	2,400
Package Store <sup>1</sup>	SF	2,400
Fast Food Restaurants	Each	1
Bank/Credit Union	Each	1
Family Service Center*	SF	0
Laundromat	SF	1,200
Dry Cleaners*	Each	0
ARC	PN	0
Chapel	PN	80
FSC Classrm/Auditorium	PN	0

\* These services are all available at Naval Submarine Base, Bangor (6 miles)

<sup>1</sup> Combined Exchange, Mini-Mart, and Package Store total 2,400 sq. ft.



ADMINISTRATIVE SENSITIVE

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UIC N00253  
NUWC DIV KEYPORT

15. Proximity of Closest Major Metropolitan Areas (provide at least three):

City	Distance (Miles)
Seattle, Washington	10
Tacoma, Washington	30
Bremerton, Washington	9



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
15-1  
UIC N00253  
NUWC DIV KEYPORT

16. Standard Rate VHA Data for Cost of Living:

Paygrade	With Dependents	Without Dependents
E1	130.59	73.07
E2	130.59	82.12
E3	127.83	94.19
E4	149.24	104.16
E5	174.96	122.16
E6	211.71	144.11
E7	244.20	169.94
E8	235.65	178.15
E9	231.91	176.04
W1	228.91	173.85
W2	260.84	204.59
W3	234.91	173.62
W4	233.17	153.75
O1E	234.07	173.85
O2E	192.84	153.75
O3E	216.81	183.42
O1	194.76	143.52
O2	190.49	140.89
O3	211.61	178.16
O4	206.88	179.90
O5	183.46	151.72
O6	246.08	203.69
O7	176.48	143.39



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
 16-1  
 UIC N00253  
 NUWC DIV KEYPORT

**17. Off-base Housing Rental and Purchase**

(a) Fill in the following table for average rental costs in the area for the period 1 April 1993 through 31 March 1994.

Type Rental	Average Monthly Rent		Average Monthly Utilities Cost
	Annual High	Annual Low	
Efficiency	375	275	\$65
Apartment (1-2 Bedroom)	700	450	\$80 - \$100
Apartment (3+ Bedroom)	800	650	\$100
Single Family Home (3 Bedroom)	1,400	600	\$150
Single Family Home (4+ Bedroom)	1,600	750	\$150 - \$225
Town House (2 Bedroom)	660	530	\$100
Town House (3+ Bedroom)	750	690	\$150
Condominium (2 Bedroom)	630	545	\$100
Condominium (3+ Bedroom)	750	700	\$150



**ADMINISTRATIVE SENSITIVE**

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 NUWC DIV KEYPORT

(b) What was the rental occupancy rate in the community as of 31 March 1994?

Type Rental	Percent Occupancy Rate
Efficiency	93
Apartment (1-2 Bedroom)	95
Apartment (3+ Bedroom)	93
Single Family Home (3 Bedroom)	92
Single Family Home (4+ Bedroom)	91
Town House (2 Bedroom)	91
Town House (3+ Bedroom)	92
Condominium (2 Bedroom)	94
Condominium (3+ Bedroom)	95

(c) What are the median costs for homes in the area?

Type of Home	Median Cost
Single Family Home (3 Bedroom)	\$96,000
Single Family Home (4+ Bedroom)	\$98,000
Town House (2 Bedroom)	\$78,000
Town House (3+ Bedroom)	\$85,000
Condominium (2 Bedroom)	\$82,000
Condominium (3+ Bedroom)	\$85,000



**ADMINISTRATIVE SENSITIVE**

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(d) For calendar year 1993, from the local MLS listings provide the number of 2, 3, and 4 bedroom homes available for purchase. Use only homes for which monthly payments would be within 90 to 110 percent of the E5 BAQ and VHA for your area.

Month	Homes Available	Number of Bedrooms		
		2	3	4+
January	24	\$78,000	\$81,000	\$83,000
February	18	\$80,000	\$84,000	\$89,000
March	24	\$82,000	\$88,500	\$92,000
April	18	\$85,000	\$92,950	\$97,000
May	20	\$85,500	\$91,000	\$95,000
June	29	\$85,000	\$90,000	\$95,000
July	27	\$85,000	\$90,000	\$95,000
August	36	\$84,000	\$89,000	\$93,000
September	26	\$85,000	\$90,000	\$94,000
October	25	\$83,000	\$90,000	\$93,000
November	37	\$84,000	\$89,000	\$92,000
December	25	\$85,000	\$91,000	\$94,000

(e) Describe the principal housing cost drivers in your local area.

1. Waterfront/View
2. Condition
3. Size
4. Neighborhood
5. Nearness to Population Centers/Schools
6. Median Income of the Community



**ADMINISTRATIVE SENSITIVE**

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18. For the top five sea intensive ratings in the principle warfare community your base supports, provide the following:

Rating	Number Sea Billets in the Local Area*	Number of Shore billets in the Local Area*
BM	12	16
EN	12	14
TM	9	9
EM	3	5
QM	3	1

\* Note: Billets assigned to Keyport.



**ADMINISTRATIVE SENSITIVE**

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19. Complete the following table for the average one-way commute for the five largest concentrations of military and civilian personnel living off-base.

Location	% Employees	Distance (mi)	Time(min)
KITSAP COUNTY	92	15	30
PIERCE COUNTY	3	45	60
JEFFERSON COUNTY	2	30	45
KING COUNTY	2	15 miles + ferry trip	60
MASON COUNTY	1	20	40



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**20. Complete the tables below to indicate the civilian educational opportunities available to service members stationed at the installation (to include any outlying sites) and their dependents:**

(a) List the local educational institutions which offer programs available to dependent children. Indicate the school type (e.g. DODDS, private, public, parochial, etc.), grade level (e.g. pre-school, primary, secondary, etc.), what students with special needs the institution is equipped to handle, cost of enrollment, and for high schools only, the average SAT score of the class that graduated in 1993, and the number of students in that class who enrolled in college in the fall of 1994.

Institution	Type	Grade Level(s)	Special Education Available	Annual Enrollment Cost per Student	1993 Avg SAT/ACT Score	% HS Grad to Higher Educ	Source of Info
North Kitsap School District	Pub	K-12	Full Svs Program	\$4,203*	V-444 M-484	60	WA State Supt of Public Inst WA State School Apportionment & School Dist
Central Kitsap School District	Pub	K-12	Full Svs Program	\$4,214*	V-439 M-471	60	WA State Supt of Public Inst WA State School Apportionment & School Dist
South Kitsap School District	Pub	K-12	Full Svs Program	\$4,165*	V-419 M-461	60	WA State Supt of Public Inst WA State School Apportionment & School Dist
Bremerton School District	Pub	K-12	Full Svs Program	\$4,137*	V-430 M-472	60	WA State Supt of Public Inst WA State School Apportionment & School Dist
North Mason School District	Pub	K-12	Full Svs Program	\$4,132*	V-440 M-470	60	WA State Supt of Public Inst WA State School Apportionment & School Dist
Peninsula School District	Pub	K-12	Full Svs Program	\$4,225*	V-452 M-495	60	WA State Supt of Public Inst WA State School Apportionment & School Dist
Bainbridge Island School District	Pub	K-12	Full Svs Program	\$4,185*	V-491 M-542	85	WA State Supt of Public Inst WA State School Apportionment & School Dist

\* Per pupil expenditures; no tuition is charged

Legend - V=Verbal

M= Math

Additionally, there are approximately 30 pre-schools, 20 church affiliated schools, and under 10 private schools in the Kitsap County area.



**ADMINISTRATIVE SENSITIVE**

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(b) List the educational institutions within 30 miles which offer programs off-base available to service members and their adult dependents. Indicate the extent of their programs by placing a "Yes" or "No" in all boxes as applies.

Institution	Type Classes	Program Type(s)				
		Adult High School	Vocational/ Technical	Undergraduate		Graduate
				Courses only	Degree Program	
Tacoma Community College	Day	YES	YES	NO	YES	NO
	Night	YES	YES	NO	YES	NO
University of Washington, Tacoma	Day	NO	NO	NO	YES	YES
	Night	NO	NO	NO	YES	NO
Bates Technical Institute, Tacoma	Day	NO	NO	YES	YES	NO
	Night	NO	NO	NO	NO	NO
Northwest College of Art, Poulsbo	Day	NO	NO	NO	YES	NO
	Night	NO	NO	NO	YES	NO
City University, Silverdale	Day	NO	NO	NO	NO	NO
	Night	NO	NO	NO	YES	YES
Eton Technical Institute, Port Orchard	Day	NO	YES	NO	YES	NO
	Night	NO	YES	NO	YES	NO
Pacific Lutheran University, Tacoma	Day	NO	NO	YES	YES	YES
	Night	NO	NO	YES	YES	YES
University of Puget Sound, Tacoma	Day	NO	NO	YES	YES	YES
	Night	NO	NO	YES	YES	YES



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Institution	Type Classes	Program Type(s)				
		Adult High School	Vocational/ Technical	Undergraduate		Graduate
				Courses only	Degree Program	
South Seattle Community College	Day	YES	YES	YES	YES	NO
	Night	YES	YES	YES	YES	NO
Seattle Central Community College	Day	YES	YES	YES	YES	NO
	Night	YES	YES	YES	YES	NO
University of Washington	Day	NO	NO	NO	YES	YES
	Night	NO	NO	NO	YES	NO
Seattle University	Day	NO	NO	NO	YES	YES
	Night	NO	NO	NO	YES	NO
Seattle Pacific University	Day	NO	NO	NO	YES	YES
	Night	NO	NO	NO	YES	NO
Olympic College	Day	YES	YES	YES	YES	NO
	Night	YES	YES	YES	YES	NO
Antioch University	Day	NO	NO	NO	YES	YES
	Night	NO	NO	YES	YES	YES



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(c) List the educational institutions which offer programs on-base available to service members and their adult dependents. Indicate the extent of their programs by placing a "Yes" or "No" in all boxes as applies.

Institution	Type Classes	Program Type(s)				
		Adult High School	Vocational/ Technical	Undergraduate		Graduate
				Courses only	Degree Program	
Olympic College	Day	NO	NO	YES	NO	NO
	Night	NO	YES	YES (Individual Study)	YES	NO
	Correspondence	NO	NO	NO	NO	NO
Southern Illinois University	Day	NO	NO	NO	YES	NO
	Night	NO	NO	NO	NO	NO
	Correspondence	NO	NO	NO	NO	NO
Chapman University	Day	NO	NO	NO	NO	NO
	Night	NO	NO	YES	YES	YES
	Correspondence	NO	NO	NO	NO	NO
Pennsylvania State University	Day	YES	YES	NO	YES	YES
	Night	NO	NO	NO	NO	NO
	Correspondence	NO	NO	NO	NO	NO



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Institution	Type Classes	Program Type(s)				
		Adult High School	Vocational/ Technical	Undergraduate		Graduate
				Courses only	Degree Program	
City College	Day	NO	NO	YES	YES	YES
	Night	NO	NO	YES	YES	YES
	Correspondence	NO	NO	NO	NO	NO
University of Massachusetts	Video based	NO	NO	NO	NO	YES
University of Idaho	Video based	NO	NO	NO	NO	YES
University of Washington	Video based	NO	NO	NO	NO	YES



**ADMINISTRATIVE SENSITIVE**

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 NUWC DIV KEYPORT

## 21. Spousal Employment Opportunities.

Provide the following data on spousal employment opportunities.

Skill Level	Number of Military Spouses Serviced by Family Service Center Spouse Employment Assistance			Local Community Unemployment Rate*
	1991	1992	1993	
Professional	0	0	4	6.4-7.2
Manufacturing	0	0	0	6.4-7.2
Clerical	1	3	5	6.4-7.2
Service	0	4	2	6.4-7.2
Other	0	0	0	6.4-7.2

\* Local unemployment rates for March 1993 and March 1994 were 6.4% and 7.2% respectively. Breakdowns by skill levels were not available.



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**22. Medical/Dental.**

a. Do your active duty personnel have any difficulty with access to medical or dental care, in either the military or civilian health care system? Develop the why of your response.

No. The level of care available at NUWC Division, Keyport is provided on site by a Branch Clinic of the Naval Regional Medical Center, Bremerton. The local clinic is staffed with a MD and Corpsman and provides sick call, with pharmacy, radiological, and laboratory support. Occupational Health/Preventive Medicine support is available to civilian and military workers assigned to NUWC Division, Keyport. Care above the acute care/injury treatment level is referred to Naval Regional Medical Center, Bremerton (9 miles). Madigan Hospital at Fort Lewis near Tacoma (55 miles) provides any specialized treatment over and above the capabilities of Naval Regional Medical Center, Bremerton. Dental care is provided at Naval Submarine Base, Bangor (4.5 miles).

In the civilian health care system, there are approximately 35 clinics and 250+ physicians (all disciplines) available, along with Harrison Memorial Hospital located in Bremerton. Dental care is provided by well over 100 dentists in the county and numerous dental clinics.

b. Do your military dependents have any difficulty with access to medical or dental care, in either the military or civilian health care system? Develop the why of your response.

NUWC Division, Keyport dependents receive care through the Naval Regional Medical Center, Bremerton, or CHAMPUS. Madigan Hospital at Fort Lewis in Tacoma provides any specialized treatment over and above the capabilities of Naval Regional Medical Center, Bremerton.

In the civilian health care system there are approximately 35 clinics and 250+ physicians (all disciplines) available along with Harrison Memorial Hospital located in Bremerton. Additionally the Seattle area has several nationally recognized hospitals available, e.g., Children's Hospital, University of Washington Medical Center, Fred Hutchinson Cancer Center, and Harborview Hospital.

Dental care is available to dependents via the civilian health care system which has well over 100 dentists (all disciplines) and dental clinics that are readily accessible.



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23. **Crime Rate.** Complete the table below to indicate the crime rate for your air station for the last three fiscal years. The source for case category definitions to be used in responding to this question are found in NCIS - Manual dated 23 February 1989, at Appendix A, entitled "Case Category Definitions." Note: the crimes reported in this table should include 1) all reported criminal activity which occurred on base regardless of whether the subject or the victim of that activity was assigned to or worked at the base; and 2) all reported criminal activity off base.

**Kitsap County Crime Rates for 1993**

Source: Washington State Association of Sheriffs and Police Chiefs

	Rate/100K Population
Violent Crimes	312
Property Crimes	3,772
Drug Crimes	119



**ADMINISTRATIVE SENSITIVE**

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09 September 1994

23 **Crime Rate.** Complete the table below to indicate the crime rate for your air station for the last three fiscal years. The source for case category definitions to be used in responding to this question are found in NCIS - Manual dated 23 February 1989, at Appendix A, entitled "Case Category Definitions." Note: the crimes reported in this table should include 1) all reported criminal activity which occurred on base regardless of whether the subject or the victim of that activity was assigned to or worked at the base; and 2) all reported criminal activity off base.

Crime Definitions	FY 1991	FY 1992	FY 1993
1. Arson (6A)			
Base Personnel - military	0	0	0
Base Personnel - civilian	0	0	0
Off Base Personnel - military	0	0	0
Off Base Personnel - civilian	0	0	0
2. Blackmarket (6C)			
Base Personnel - military	0	0	0
Base Personnel - civilian	0	0	0
Off Base Personnel - military	0	0	0
Off Base Personnel - civilian			
3. Counterfeiting (6G)	0	0	0
Base Personnel - military	0	0	0
Base Personnel - civilian	0	0	0
Off Base Personnel - military	0	0	0
Off Base Personnel - civilian	0	0	0
4. Postal (6L)			
Base Personnel - military	0	0	0
Base Personnel - civilian	0	0	0
Off Base Personnel - military	0	0	0
Off Base Personnel - civilian	0	0	0



**ADMINISTRATIVE SENSITIVE**

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**ADMINISTRATIVE SENSITIVE**

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Crime Definitions	FY 1991	FY 1992	FY 1993
5. Customs (6M)			
Base Personnel - military	0	0	0
Base Personnel - civilian	0	0	0
Off Base Personnel - military	0	0	0
Off Base Personnel - civilian	0	0	0
6. Burglary (6N)			
Base Personnel - military	0	2	0
Base Personnel - civilian	1	0	0
Off Base Personnel - military	0	0	0
Off Base Personnel - civilian	0	0	0
7. Larceny - Ordnance (6R)			
Base Personnel - military	0	0	0
Base Personnel - civilian	0	0	0
Off Base Personnel - military	0	0	0
Off Base Personnel - civilian	0	0	0
8. Larceny - Government (6S)			
Base Personnel - military	0	0	0
Base Personnel - civilian	0	4	5
Off Base Personnel - military	0	0	0
Off Base Personnel - civilian	0	0	0



**ADMINISTRATIVE SENSITIVE**

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**ADMINISTRATIVE SENSITIVE**

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Crime Definitions	FY 1991	FY 1992	FY 1993
9. Larceny - Personal (6T)			
Base Personnel - military	3	0	0
Base Personnel - civilian	5	3	11
Off Base Personnel - military	0	0	0
Off Base Personnel - civilian	0	0	0
10. Wrongful Destruction (6U)			
Base Personnel - military	2	1	1
Base Personnel - civilian	1	4	7
Off Base Personnel - military	0	0	0
Off Base Personnel - civilian	0	0	0
11. Larceny - Vehicle (6V)			
Base Personnel - military	0	0	0
Base Personnel - civilian	0	0	0
Off Base Personnel - military	0	0	0
Off Base Personnel - civilian	0	0	0
12. Bomb Threat (7B)			
Base Personnel - military	0	0	0
Base Personnel - civilian	1	0	0
Off Base Personnel - military	0	0	0
Off Base Personnel - civilian	0	0	0



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**ADMINISTRATIVE SENSITIVE**

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Crime Definitions	FY 1991	FY 1992	FY 1993
13. Extortion (7E)			
Base Personnel - military	0	0	0
Base Personnel - civilian	0	0	0
Off Base Personnel - military	0	0	0
Off Base Personnel - civilian	0	0	0
14. Assault (7G)			
Base Personnel - military	1	0	0
Base Personnel - civilian	0	1	0
Off Base Personnel - military	0	0	0
Off Base Personnel - civilian	0	0	0
15. Death (7H)			
Base Personnel - military	0	0	0
Base Personnel - civilian	0	0	0
Off Base Personnel - military	0	0	0
Off Base Personnel - civilian	0	0	0
16. Kidnapping (7K)			
Base Personnel - military	0	0	0
Base Personnel - civilian	0	0	0
Off Base Personnel - military	0	0	0
Off Base Personnel - civilian	0	0	0



**ADMINISTRATIVE SENSITIVE**

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**ADMINISTRATIVE SENSITIVE**

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Crime Definitions	FY 1991	FY 1992	FY 1993
18. Narcotics (7N)			
Base Personnel - military	0	0	0
Base Personnel - civilian	0	0	0
Off Base Personnel - military	0	0	0
Off Base Personnel - civilian	0	0	0
19. Perjury (7P)			
Base Personnel - military	0	0	0
Base Personnel - civilian	0	0	0
Off Base Personnel - military	0	0	0
Off Base Personnel - civilian	0	0	0
20. Robbery (7R)			
Base Personnel - military	0	0	0
Base Personnel - civilian	0	0	0
Off Base Personnel - military	0	0	0
Off Base Personnel - civilian	0	0	0
21. Traffic Accident (7T)			
Base Personnel - military	6	4	5
Base Personnel - civilian	24	21	22
Off Base Personnel - military	0	0	0
Off Base Personnel - civilian	1	2	3

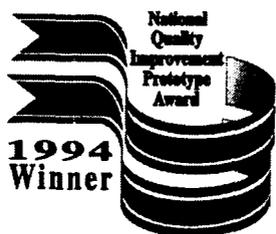


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**ADMINISTRATIVE SENSITIVE**

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23-6R  
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Crime Definitions	FY 1991	FY 1992	FY 1993
22. Sex Abuse - Child (8B)			
Base Personnel - military	0	0	0
Base Personnel - civilian	0	0	0
Off Base Personnel - military	0	0	0
Off Base Personnel - civilian	0	0	0
23. Indecent Assault (8D)			
Base Personnel - military	0	0	0
Base Personnel - civilian	0	0	0
Off Base Personnel - military	0	0	0
Off Base Personnel - civilian	0	0	0
24. Rape (8F)			
Base Personnel - military	0	0	0
Base Personnel - civilian	0	0	0
Off Base Personnel - military	0	0	0
Off Base Personnel - civilian	0	0	0
25. Sodomy (8G)			
Base Personnel - military	0	0	0
Base Personnel - civilian	0	0	0
Off Base Personnel - military	0	0	0
Off Base Personnel - civilian	0	0	0



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**TAB A**  
**TECHNICAL OPERATIONS**  
**FUNCTIONAL SUPPORT AREA - LIFE CYCLE WORK AREA FORM**



**ADMINISTRATIVE SENSITIVE**

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**TAB B**  
**SPECIAL FACILITIES AND EQUIPMENT**  
**FACILITIES/EQUIPMENT CAPABILITY FORM**



**ADMINISTRATIVE SENSITIVE**

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**TAB C**  
**RANGE RESOURCES**  
**RANGE CAPABILITY FORM**



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**APPENDIX A**



**ADMINISTRATIVE SENSITIVE**

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## **I. FUNCTIONAL SUPPORT AREAS**

### **1. PLATFORMS**

- 1.1 Undersea
- 1.2 Aircraft
- 1.3 Surface Ship
- 1.4 Space Satellites
- 1.5 Ground Vehicles

### **2. WEAPONS SYSTEMS**

- 2.1 Gun Systems
- 2.2 Guided Missiles
- 2.3 Free Fall Weapons and Rockets
- 2.4 Torpedoes
- 2.5 Mines
- 2.6 Directed Energy Systems
- 2.7 Explosives
- 2.8 Launchers
- 2.9 Fire Control
- 2.10 Weapons Data Links
- 2.11 Weapons Fuzing
- 2.12 Weapons Propulsion
- 2.13 Other Ordnance
- 2.14 Explosive Ordnance Disposal

### **3. COMBAT SYSTEM INTEGRATION**

- 3.1 Subsurface
- 3.2 Air
- 3.3 Surface
- 3.4 Multiplatform

### **4. SPECIAL OPERATIONS SUPPORT**

- 4.1 Landing Force Equipment and Systems
- 4.2 Coastal/Special Warfare Support

### **5. SENSORS & SURVEILLANCE SYSTEMS**

- 5.1 Sonar Systems
- 5.2 Radar Systems
- 5.3 Special Sensors
- 5.4 Space Sensor/Surveillance Systems
- 5.5 Ocean Surveillance



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6. NAVIGATION

- 6.1 Submarine Navigation Systems
- 6.2 Aircraft Navigation Systems
- 6.3 Surface Ship Navigation Systems
- 6.4 Weapons Navigation Systems
- 6.5 Satellite Navigation Systems

7. COMMAND, CONTROL, COMMUNICATIONS AND INTELLIGENCE (C<sup>3</sup>I)

- 7.1 Submarine
- 7.2 Airborne
- 7.3 Shipboard
- 7.4 Land-Based
- 7.5 Space Communications Systems
- 7.6 Non-Tactical Data Systems
- 7.7 Air Traffic Control Systems
- 7.8 Intelligence Information Systems

8. DEFENSE SYSTEMS

- 8.1 Ballistic Missile Defense
- 8.2 Countermeasures (CM)
- 8.3 Electronic Warfare (EW) Systems

9. STRATEGIC PROGRAMS

- 9.1 Navy Strategic Systems
- 9.2 Nuclear Weapons and Effects

10. GENERAL MISSION SUPPORT

- 10.1 Personnel and Training
  - 10.1.1 Submarine-Related Training Systems
  - 10.1.2 Aircraft-Related Training Systems
  - 10.1.3 Surface Ship-Related Training Systems
  - 10.1.4 Weapons-Related Training Systems
  - 10.1.5 Human Resources Research and Development
- 10.2 Logistics Planning and Implementation
- 10.3 Facilities Engineering
- 10.4 Diving, Salvage and Ocean Engineering
- 10.5 Environmental Description, Prediction, and Effects
- 10.6 Crew Equipment and Life Support
  - 10.6.1 Submarine
  - 10.6.2 Aircraft
  - 10.6.3 Surface Ship



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- 10.6.4 Medical Research and Combat Casualty Care
- 10.6.5 Clothing and Textiles
- 10.7 Major Range Development and Operation
- 10.8 Other Subsidiary Systems or Components
- 10.9 Activity Mission and Function Support

11. GENERIC TECHNOLOGY BASE. [Includes basic research and exploratory development (Budget Categories 6.1 & 6.2) projects that do not fit under the more warfare-focused functional support areas.]

- 11.1 Computers.
- 11.2 Software.
- 11.3 Communications Networking.
- 11.4 Electronic Devices.
- 11.5 Materials and Processes.
- 11.6 Energy Storage.
- 11.7 Propulsion and Energy Conversion.
- 11.8 Design Automation.
- 11.9 Human-System Interfaces.
- 11.10 Other Technology Base Programs.

## **II. LIFE-CYCLE WORK AREAS**

### **RDT&E**

- 1. BASIC RESEARCH
- 2. EXPLORATORY DEVELOPMENT
- 3. ADVANCED DEVELOPMENT
- 4. ENGINEERING AND MANUFACTURING DEVELOPMENT
- 5. RDT&E MANAGEMENT SUPPORT
- 6. OPERATIONAL SYSTEMS DEVELOPMENT

### **ACQUISITION**

- 7. PRODUCTION
- 8. ACCEPTANCE TESTING
- 9. MODERNIZATION
- 10. PROGRAM SUPPORT

### **LIFE -TIME SUPPORT**

- 11. MAINTENANCE
- 12. REPAIR
- 13. TESTING
- 14. IN-SERVICE ENGINEERING



**ADMINISTRATIVE SENSITIVE**

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- 15. PROGRAM SUPPORT
- 16. RETIREMENT

**GENERAL**

- 17. TRAINING/OPERATIONAL SUPPORT
- 18. SIMULATION, MODELING AND ANALYSIS



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
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**APPENDIX B**



**ADMINISTRATIVE SENSITIVE**

DATA CALL #5  
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## I. FUNCTIONAL SUPPORT AREA DEFINITIONS

**1. PLATFORMS.** Those self-propelled, boosted or towed conveyances used for the strategic and tactical deployment of forces, weapons, materials and supplies in support of naval warfare. Projects within this area are limited to those in which the principal objective is to provide technological wherewithal to develop Navy aerospace craft, ships, submarines, boats, and amphibians.

1.1 *Undersea.* Self-propelled, boosted, or towed conveyances for transporting a burden under the sea. The vehicle package includes the design, structures, materials, non-nuclear propulsion, power and auxiliary equipment, transmissions and propulsors, fuels and lubricants, energy conservation and pollution abatement equipment, control systems, and silencing inherent in its construction and operation, but excluding mission oriented systems. Included are submarines and other submersibles including their application as unmanned autonomous vehicles (UAV) and targets.

1.2 *Aircraft.* Self-propelled, boosted, or towed conveyances for transporting a burden through the air. The vehicle package includes the design, structures, materials, non-nuclear propulsion, power and auxiliary equipment, transmissions and propulsors, fuels and control systems and silencing inherent in its construction and operation, but excluding mission oriented systems. Included are all air vehicles including their application as UAVs and targets.

1.3 *Surface Ship.* Self-propelled, boosted, or towed conveyances for transporting a burden on land or sea. The vehicle package includes the design, structures, materials, non-nuclear propulsion, power and auxiliary equipment, transmissions and propulsors, fuels and lubricants, energy conservation and pollution abatement equipment, control systems, and silencing inherent in its construction and operation, but excluding mission oriented systems. Included are ships and craft including their application as UAVs and targets.

1.4 *Space Satellites.* A device or spacecraft in orbit. The vehicle package includes the design, structures, materials, non-nuclear propulsion, power and auxiliary equipment, and control systems, inherent in its construction and operation.

1.5 *Ground Vehicles.* Self-propelled, boosted, or towed conveyances for transporting a burden on land. The vehicle package includes the design, structures, materials, non-nuclear propulsion, power and auxiliary equipment, transmissions and propulsors, fuels and lubricants, energy conservation and pollution abatement equipment, control systems, and silencing inherent in its construction and operation, but excluding mission oriented systems.



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**2. WEAPONS SYSTEMS.** A system that provides the capability to defeat naval and military targets by destructive means. Included are counter-countermeasures and other design features to reduce the susceptibility of the weapon to counter actions, but excluded are those projects in which the principal objective is to counter a weapons system or those efforts to make a system (other than weapons) less vulnerable to enemy weapons.

**2.1 Gun Systems.** Ordnance which fires projectiles; includes related ammunition (guided projectiles are included in "guided missiles". Included are gun systems aboard aircraft and ships, and gun systems used by personnel.

**2.2 Guided Missiles.** Weapons, either self-propelled, (i.e., reaction launched) or impulse driven (i.e., gun/tube impulse launched) capable of homing on, or following a beam or command signals through the air to a target (includes guided projectiles). Included are missiles that are launched by submarine, aircraft, and ship.

**2.3 Free Fall Weapons and Rockets.** Free fall weapons are those air-delivered weapons, including components and subsystems, which follow a ballistic trajectory after gravity launch without any guidance other than that from the initial orientation and velocity of the launching aircraft. A rocket is a self-propelled airborne vehicle whose trajectory or course, while in flight, cannot be controlled.

**2.4 Torpedoes.** Self-propelled, guided or unguided underwater weapons. Included are torpedoes launched by submarine, aircraft, and ship.

**2.5 Mines.** Self-activating standoff or contact explosive devices that are designed to destroy or damage ground vehicles, boats, ships, or aircraft, or designed to wound, kill, or otherwise incapacitate personnel.

**2.6 Directed Energy Systems.** Devices and techniques for generating and focusing high-intensity beams of electromagnetic energy or charged particles upon targets with lethal effects.

**2.7 Explosives.** Metastable compounds which can rapidly release large quantities of energy mostly in the form of hot, high-pressure gases. Explosives are used in naval munitions such as mines, torpedoes, missiles, etc., and also in other Navy products such as aircraft escape systems, fuse trains, etc.

**2.8 Launchers.** That group of devices, components, or subsystems needed to support, hold, and launch expendable weapons, countermeasure devices, or other stores; the control systems for managing these systems and the stores they carry.



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2.9 *Fire Control*. Those platform-based systems which provide data for and/or control the launch platform/weapon/weapon-target interaction in all phases required by a weapons system (e.g., acquisition, track, commit-to-fire-pre-launch, post-launch, mid-course, terminal intercept, and assessment). Included are systems that are based undersea, aboard aircraft, shipboard, and on land.

2.10 *Weapons Data Links*. Efforts include the data links that are part of the weapon's command, control and communications systems.

2.11 *Weapons Fuzing*. Efforts leading to the design of systems to sense a target or the result of other prescribed conditions such as time, barometric pressure, command, etc., and initiate a train of fire. Safing and arming are primary functions performed by a fuse to preclude initiation of the ammunition before the desired position or time.

2.12 *Weapons Propulsion*. Included are propellants, subsystems and systems that comprise the means by which a weapons system moves through the air or sea.

2.13 *Other Ordnance*. Includes efforts that do not fit in the above categories (e.g., pyrotechnics, gas generators, CAD/PAD/AEPS).

2.14 *Explosive Ordnance Disposal*. Efforts relating to the technical support of explosive ordnance disposal technology and training.

**3. COMBAT SYSTEM INTEGRATION.** That effort required to introduce a new system into the operating forces. It involves the integration and evaluation of a new hardware or software subsystem installed in a Navy platform. It includes the mating, installation, and operational support of the resulting higher level system to ensure optimum operating performance.

3.1 *Subsurface*. The integration and evaluation of the various hardware and software subsystems that make up a higher level system, and the mating, installation, and operational support of this higher level system, including its operational software and training systems into undersea platforms.

3.2 *Air*. The integration and evaluation of the various hardware and software subsystems that make up a higher level system, and the mating, installation, and operational support of this higher level system, including its operational software and training systems into air platforms.



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3.3 *Surface*. The integration and evaluation of the various hardware and software subsystems that make up a higher level system, and the mating, installation, and operational support of this higher level system, including its operational software and training systems into surface platforms.

3.4 *Multiplatform*. The integration of multiplatform hardware and software subsystems to make up a higher level system, including the mating, installation, and operational support (including training systems) of this higher level system.

**4. SPECIAL OPERATIONS SUPPORT.** Those efforts which are in support of amphibious landing, Marine Corps operations, special warfare and other unique operations. It includes weapons, countermeasures, surveillance and a command support which are developed specifically for the projection of forces ashore and that do not have an application by the Navy general forces in the role of sea control.

4.1 *Landing Force Equipment and Systems*. Involved is that RDT&E effort which is not functionally a part of the amphibious platform. Specifically, this includes reconnaissance of amphibious objective areas, environmental support of amphibious operations, amphibious logistics and the integration of the amphibious and Marine Corps systems required to land amphibious forces on a hostile shore and establish a beachhead. (Contingency facilities in support of forces ashore are included in "facilities".)

4.2 *Coastal/Special Warfare Support*. Techniques and systems required to defend coastal, inshore and harbor facilities as well as those needed to conduct operations such as reconnaissance, deception, coastal or offshore interdiction and assault, counterinsurgency, intelligence gathering, remote sensor operation and waterborne intrusion detection. Special warfare systems include systems, techniques, and concepts utilized by specifically cross-trained personnel in unconventional warfare and coastal/riverine operations.

**5. SENSORS & SURVEILLANCE SYSTEMS.** Those systems used to systematically observe air, space, surface and subsurface areas to detect, classify, localize and identify real or potential military targets. Excluded are those projects in which the principal objective is navigation, weapon fire control or broadbased investigation of the properties of the media or the propagation of energy therein.

5.1 *Sonar Systems*. Those sonar systems and devices used to conduct search, reconnaissance, and surveillance operations to detect, classify, locate, and/or track targets. Included are those systems and devices that are mobile aboard undersea, air, and surface platforms, and those that are fixed.



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5.2 *Radar Systems.* Those radar systems and devices used to conduct search, reconnaissance, or surveillance operations to detect, classify, locate, and/or track targets. Included are those systems and devices that are mobile aboard undersea, air, and surface platforms, and those that are fixed.

5.3 *Special Sensors.* Those systems and devices which utilize unique phenomena or methods or combinations of methods to conduct search, reconnaissance, or surveillance operations to detect, classify, locate, and/or track targets. Included are active sensors, passive sensors (e.g., thermal imagers, low light level TV, and infrared search and track systems), and the associated signal and image processing.

5.4 *Space Sensor/Surveillance Systems.* Those devices and systems in Earth orbit that are used to conduct search, reconnaissance, or surveillance operations to detect, classify, locate and/or track targets.

5.5 *Ocean Surveillance.* Systems and equipment for systematic observation of ocean areas for identification and localization of ships, submarines, and aircraft from fixed and mobile platforms including operational software development, and integration of multi-sensor, coordinated detection data and its display at appropriate sites.

**6. NAVIGATION.** Those systems which utilize electromagnetic, acoustic, or inertial means to guide or navigate surface, subsurface, or aerospace platforms. Included are those systems deployed aboard submarines, aircraft, surface ships and satellites, as well as those used in weapons systems.

6.1 *Submarine Navigation Systems.* Navigation systems deployed aboard submarines, or other undersea vehicles.

6.2 *Aircraft Navigation Systems.* Navigation systems deployed aboard aircraft.

6.3 *Surface Ship Navigation Systems.* Navigation systems deployed aboard surface ships.

6.4 *Weapons Navigation Systems.* Navigation systems installed within weapon systems, such as guided missiles.

6.5 *Satellite Navigation Systems.* Navigation systems deployed aboard satellites.



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**7. COMMAND, CONTROL, COMMUNICATIONS AND INTELLIGENCE (C<sup>3</sup>I).** The acquisition, processing and dissemination of information required to plan, direct, and control operations. Included are those projects in command and control, communications and intelligence. Excluded are surveillance systems, and guidance and control of vehicles and weapons. These C<sup>3</sup> systems may be internal or external to submarine, airborne, surface, and land-based platforms.

7.1 *Submarine.* C3 systems deployed aboard submarines, or other undersea vehicles.

7.2 *Airborne.* C3 systems deployed aboard aircraft.

7.3 *Shipboard.* C3 systems deployed aboard surface ships.

7.4 *Land-Based.* C3 systems deployed at shore facilities.

7.5 *Space Communications.* Communications systems in Earth orbit used to convey information.

7.6 *Non-Tactical Data Systems.* Data systems utilized aboard the Navy's operating forces and at shore sites that support ship, submarine and aircraft maintenance, configuration and asset management, supply, inventory, finance, medical, dental, manpower management, administration, food services (ship's mess), and resale operations (ship's stores).

7.7 *Air Traffic Control Systems.* Systems used to promote the safe, orderly, and expeditious movement of air traffic.

7.8 *Intelligence Information Systems.* The systems necessary to conduct the naval warfare task of intelligence. This task involves the assessment and management of information obtained via surveillance, reconnaissance, and other means to produce timely indications and warning, location, identification, intentions, technical capabilities, and tactics of potential enemies and other countries of interest.

**8. DEFENSE SYSTEMS.** Those systems that are principally designed to defeat a particular weapon system; those systems that are designed to reduce the effectiveness of an enemy's surveillance, communications, navigation and command and control; as well as those efforts directed toward gathering information on the emissions of enemy systems. It does not include those projects in which the principal objective is to incorporate design features in vehicles, surveillance, communication, navigation and other support systems which reduce their vulnerability to enemy action. It also does not include chemical/biological defense for personnel.



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personnel.

8.1 *Ballistic Missile Defense*. Systems designed to protect civilian population centers, military forces, and territory from ballistic missile attack.

8.2 *Countermeasures (CM)*. Those systems that are principally designed to defeat a particular weapon system; reduce the effectiveness of an enemy's surveillance, communications, navigation and command and control; as well as gather information on the emissions of enemy systems. Included are those projects to develop systems deployed aboard submarine, aircraft, and surface ship, and those for countering enemy mine warfare through the destruction or neutralization of minefields.

8.3 *Electronic Warfare (EW) Systems*. Those systems, techniques, and devices utilized to determine, exploit, reduce, or prevent hostile use of the electromagnetic spectrum. Included are those projects to develop systems deployed aboard submarine, aircraft, and surface ship, as well as those to develop EW simulators.

**9. STRATEGIC PROGRAMS.** Programs conducted to support the deployment and use of the Navy's strategic deterrence force, as well as those programs conducted on nuclear weapons and effects.

9.1 *Navy Strategic Systems*. Those ships and weapon systems, subsystems, devices, techniques, trainers and facilities required specifically for the deployment and use of the Navy's strategic deterrence force.

9.2 *Nuclear Weapons and Effects*. Nuclear weapons effects and countermeasures, including thermal and nuclear radiation effects and the hardening of components and of weapons systems both nuclear and non-nuclear.

**10. GENERAL MISSION SUPPORT.** Those major areas of support required by Navy general forces that are not included under platforms, weapons systems, combat system integration, special operations support, sensors and surveillance systems, navigation, C<sup>3</sup>I, defense systems, strategic programs, and technology base programs.

10.1 *Personnel and Training*. Human resources research and development for the areas of manpower, personnel, education, and training and its support and service functions for human factors effort in system design, development and acquisition. Included are those systems related to submarine, aircraft, surface ship and weapons training, as well as human resources research.



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- 10.1.3 Surface Ship-Related Training Systems
- 10.1.4 Weapons-Related Training Systems
- 10.1.5 Human Resources Research and Development

10.2 *Logistics Planning and Implementation.* Projects for those aspects of military operations which deal with the movement, maintenance, supply, and support of Naval forces afloat and ashore, including underway replenishment, warehousing and mobile logistics maintenance and repair activities; material acquisition, control, handling, distribution and disposal processes; and logistics planning, control, and information processing functions.

10.3 *Facilities Engineering.* Products for (a) ocean facilities including the siting, design, construction/implant, and maintenance of facilities attached to the sea floor such as cable structures, pipelines, communications/power cables and Fleet moorings; (b) contingency facilities and equipment to support Navy and Marine Corps forces ashore in amphibious objective areas and at advanced naval bases; (c) permanent shore facilities such as buildings, piers, drydocks, airfields, POL and weapons storage, and utilities; (d) energy systems ashore including conservation, synthetic fuels, energy self-sufficiency; and (e) environmental protection systems ashore such as industrial wastewater treatment plants, air and noise pollution control devices, and solid waste management systems.

10.4 *Diving, Salvage and Ocean Engineering.* Those support systems and equipment that are required by the Navy in the performance of ocean bottom search, diving, rescue, recovery, salvage operations, and siting, design, construction/implantment, inspection, maintenance and recovery of underwater facilities and associated systems.

10.5 *Environmental Description, Prediction, and Effects.* The study, modeling, and simulation of atmospheric, oceanic, terrestrial, and space environmental effects, both natural and man-made, including the interaction of a weapon system with its operating medium and man-produced phenomena such as obscurants found on the battlefield.

10.6 *Crew Equipment and Life Support.* Techniques, equipment and devices to provide protection for and support of Navy operating personnel, including chemical/biological defense. Included are systems aboard submarines, aircraft, and surface ships, as well as medical research and combat casualty care, and clothing and textiles.

- 10.6.1 Submarine
- 10.6.2 Aircraft
- 10.6.3 Surface Ship
- 10.6.4 Medical Research and Combat Casualty Care
- 10.6.5 Clothing and Textiles



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10.7 *Major Range Development and Operation.* The design, equipping, and operation of ranges offering diverse and accurate measurement and reconstruction capabilities to establish performance profile data on newly designed, as well as existing, naval vehicles and systems operating in a realistic environment.

10.8 *Other Subsidiary Systems or Components.* Subsidiary systems or components that do not fit within the above product areas (e.g., batteries).

10.9 *Activity Mission and Function Support.* Efforts that clearly support the Activity's responsibilities but which cannot be uniquely assigned to a specific functional area.

**11. GENERIC TECHNOLOGY BASE.** Includes basic research and exploratory development (Budget Categories 6.1 & 6.2) projects that do not fit under the more warfare-focused functional support areas. These areas include computers, software, communications networking, electronic devices, materials and processes, energy storage, propulsion and energy conversion, design automation, human-system interfaces, and other technology base areas.

11.1 *Computers.* High performance computing systems (and their software operating systems) providing orders-of-magnitude improvements in computational and communications capabilities as a result of improvements in hardware, architectural designs, networking, and computational methods.

11.2 *Software.* The tools and techniques that facilitate the timely generation, maintenance, and enhancement of affordable and reliable applications software, including software for distributed systems, data base software, artificial intelligence, and neural nets.

11.3 *Communications Networking.* The timely, reliable, and secure production and worldwide dissemination of information, using shared communications media and common hardware and applications software from originators to DoD consumers, in support of joint-Service mission planning, simulation, rehearsal, and execution.

11.4 *Electronic Devices.* Ultra-small (nanoscale) electronic and optoelectronic devices, combined with electronic packaging and photonics, for high speed computers, data storage modules, communications systems, advanced sensors, signal processing, radar, imaging systems, and automatic control.

11.5 *Materials and Processes.* Development of man-made materials (e.g., composites, electronic and photonic materials, smart materials) for improved structures, higher temperature engines, signature reduction, and electronics, and the synthesis and processing required for their application.



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11.6 *Energy Storage*. The safe, compact storage of electrical or chemical energy, including energetic materials for military systems.

11.7 *Propulsion and Energy Conversion*. The efficient conversion of stored energy into usable forms, as in fuel efficient aircraft turbine engines and hypersonic systems.

11.8 *Design Automation*. Computer-aided design, concurrent engineering, simulation, and modeling; including the computational aspects of fluid dynamics, electromagnetics, advanced structures, structural dynamics, and other automated design processes.

11.9 *Human-System Interfaces*. The machine integration and interpretation of data and its presentation in a form convenient to the human operator; displays; human intelligence emulated in computational devices; and simulation and synthetic environments.

11.10 *Other Technology Base Programs*. All technology base programs (Budget Categories 6.1 and 6.2 only) that do not fit into the above warfare-focused functional support areas (#1 - #10), or within the above generic technology base areas (#11.1 - #11.9).

## II. LIFE-CYCLE WORK AREA DEFINITIONS

### RDT&E

1. **BASIC RESEARCH**. (Budget Category 6.1 only) This area includes scientific study and experimentation to increase knowledge and understanding in the physical, engineering, environmental and life sciences related to long-term national security needs.
2. **EXPLORATORY DEVELOPMENT**. (Budget Category 6.2 only) This area includes efforts to solve specific military problems, short of major development. Exploratory development may vary from fairly fundamental applied research to sophisticated breadboard hardware, study programming and planning efforts.
3. **ADVANCED DEVELOPMENT**. (Budget Category 6.3 only) This area includes efforts on projects which have moved into the development of hardware for test. The prime objective is proof of design concept rather than the development of hardware for service use.
4. **ENGINEERING AND MANUFACTURING DEVELOPMENT**. (Budget Category 6.4 only) This area includes programs in full scale development, but which have not received approval for production or had production funds included in the DoD budget submission for the budget or subsequent fiscal year.



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5. **RDT&E MANAGEMENT SUPPORT.** (Budget Category 6.5 only) This area includes support of installations or operations required for general research and development use. Included would be test ranges, military construction, maintenance support of laboratories, operations and maintenance of test aircraft and ships, and studies and analyses in support of the R&D program.

6. **OPERATIONAL SYSTEMS DEVELOPMENT.** (Budget Category 6.6 only) This area includes projects still in full-scale development, but which have received approval for production through Defense Acquisition Board or other action, or for which production funds have been included in the DoD budget submission for the budget or subsequent fiscal year. All work in this area is identified by major line item projects that appear as "RDT&E Costs of Weapon System Elements" in other programs.

### **ACQUISITION**

7. **PRODUCTION.** During this phase, the system, including training equipment, spares, etc., is produced for operational use.

8. **ACCEPTANCE TESTING.** This phase involves the test and evaluation of production items to demonstrate that the items procured fulfill the requirements and specifications of the procuring contract on agreement

9. **MODERNIZATION.** This phase of the work involves the modification, upgrade, or improvement of a system or subsystem.

10. **PROGRAM SUPPORT.** This phase involves all work not fully under the category of production (#7), acceptance testing (#8), or modernization (#9), that occurs during the acquisition of new systems or subsystems.

### **LIFE-TIME SUPPORT**

11. **MAINTENANCE.** This phase of work involves the maintenance of systems and subsystems.

12. **REPAIR.** This phase of work involves the repair of systems or subsystems.

13. **TESTING.** This phase is typically funded from Budget Category 6.5 or procurement program elements. Work in this area supports developmental and/or operational testing and focuses on the evaluation of system safety, technical performance, environmental (climatic, electromagnetic, etc.) effects, sustainability and operational suitability, maturity of production



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processes, and compliance with the specifications and quality standards.

14. **IN-SERVICE ENGINEERING.** This phase is typically funded from Budget Category 6.6 or operations and maintenance (O&M) program elements. In-service engineering tends to focus on system peculiar capabilities in order to conduct check-out of the system and/or subsystem after they have undergone a modification, upgrade or improvement.

15. **PROGRAM SUPPORT.** This phase involves all work ant falling under the categories of maintenance (#11), repair (#12), testing (#13), in-service engineering (#14) and retirement (#16) that occur during the life-time support of new systems and/or subsystems.

16. **RETIREMENT.** This phase includes the retirement and disposal of obsolete systems and/or subsystems.

### **GENERAL**

17. **TRAINING/OPERATIONAL SUPPORT.** Efforts in this area, involve the training of operational forces in the use of new techniques, equipment and systems, tactics or doctrine. Training and operational support is typically funded from O&M program elements.

18. **SIMULATION, MODELING AND ANALYSIS.** This phase of work provides a simulated test environment or representation of systems, components and platforms. This work can be carried out throughout the development and test process as analytical tools, as well as tools to drive or control electronic and other environmental stimuli.



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Naval Undersea Warfare Center Division Keyport  
BRAC 95 Data Call 5 Submission

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

NEXT ECHELON LEVEL (if applicable)

RADM Scott L. Sears  
NAME (Please type or print)

Scott L. Sears  
Signature

Commander  
Title

11 MAY 94  
Date

Naval Undersea Warfare Center  
Activity

~~I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.~~

~~NEXT ECHELON LEVEL (if applicable)~~

~~NAME (Please type or print)~~

~~Signature~~

~~Title~~

~~Date~~

~~Activity~~

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

MAJOR CLAIMANT LEVEL

G. R. STERNER  
NAME (Please type or print)

G. R. Sterner  
Signature

Commander  
Title  
Naval Sea Systems Command

5-13-94  
Date

Activity

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

DEPUTY CHIEF OF NAVAL OPERATIONS (LOGISTICS)  
DEPUTY CHIEF OF STAFF (INSTALLATIONS & LOGISTICS)

J.B. Greene, Jr  
NAME (Please type or print)

J.B. Greene Jr.  
Signature

Acting  
Title

27 May 1994  
Date

**BRAC-95 CERTIFICATION**

Reference: SECNAVNOTE 11000 of 08 December 1993

In accordance with the policy set forth by the Secretary of the Navy, personnel of the Department of the Navy, uniformed and civilian, who provide information for use in BRAC-95 process are required to provide a signed certification that states "I certify that the information contained herein is accurate and complete to the best of my knowledge and belief."

The signing of this certification constitutes a representation that the certifying official has reviewed the information and either (1) personally vouches for its accuracy and completeness or (2) has possession of, and is relying upon a certification executed by a competent subordinate.

Each individual in your activity generating information for the BRAC-95 process must certify that information. Enclosure (1) is provided for individual certifications and may be duplicated as necessary. You are directed to maintain those certifications at your activity for audit purposes. For purposes of this certification sheet, the commander of the activity will begin the certification process and each reporting senior in the Chain of Command reviewing the information will also sign this certification sheet. This sheet must remain attached to this package and be forwarded up the Chain of Command. Copies must be retained by each level in the Chain of Command for audit purposes.

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

**ACTIVITY COMMANDER**

NAME: Dennis K. Gibbs  
(Please type or print)

  
Signature

Commander  
Title

11 May 94  
Date

**NAVAL UNDERSEA WARFARE CENTER DIVISION, KEYPORT**  
Activity

Addendum to Data Call #5 for Keyport submit  
(Pages 4-7a, b, c, d; 4-8a)

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

NEXT ECHELON LEVEL (if applicable)

RADM Scott L. Sears  
NAME (Please type or print)

Scott L. Sears  
Signature

Commander  
Title

22 JUNE 94  
Date

Naval Undersea Warfare Center  
Activity

~~I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.~~

~~NEXT ECHELON LEVEL (if applicable)~~

~~NAME (Please type or print)~~

~~Signature~~

~~Title~~

~~Date~~

~~Activity~~

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

MAJOR CLAIMANT LEVEL

G. R. STERNER  
NAME (Please type or print)

G. R. Sterner  
Signature

Naval Systems Command  
Title

7-1-94  
Date

Activity

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

DEPUTY CHIEF OF NAVAL OPERATIONS (LOGISTICS)  
DEPUTY CHIEF OF STAFF (INSTALLATIONS & LOGISTICS)

J. B. GREENE, JR.  
NAME (Please type or print)  
ACTING

J. B. Greene, Jr.  
Signature

Title

12 JUL 1994  
Date

**BRAC-95 CERTIFICATION**

Reference: SECNAVNOTE 11000 of 08 December 1993

In accordance with the policy set forth by the Secretary of the Navy, personnel of the Department of the Navy, uniformed and civilian, who provide information for use in BRAC-95 process are required to provide a signed certification that states "I certify that the information contained herein is accurate and complete to the best of my knowledge and belief."

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I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

**ACTIVITY COMMANDER**

NAME: Dennis K. Gibbs  
(Please type or print)

  
Signature

Commander  
Title

21 JUNE 94  
Date

**NAVAL UNDERSEA WARFARE CENTER DIVISION, KEYPORT**  
Activity

Addendum to Data Call #5 for Keyport submit (Pages 4-7a, b, c, d; 4-8a)

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**Addendum to NUWC Division Keyport  
BRAC 95 Data Call 5 Submission  
(Pages 5-3a and 5-4a)**

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

NEXT ECHELON LEVEL (if applicable)

Scott L. Sears  
RADM Scott L. Sears  
NAME (Please type or print)

Scott L. Sears  
Signature

Commander  
Title

31 Aug 94  
Date

Naval Undersea Warfare Center  
Activity

~~I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.~~

~~NEXT ECHELON LEVEL (if applicable)~~

~~NAME (Please type or print)~~

~~Signature~~

~~Title~~

~~Date~~

~~Activity~~

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

MAJOR CLAIMANT LEVEL

NAME (Please type or print)

S. R. Sterner  
Signature

R. STERNER  
Commander  
Naval Sea Systems Command

9-6-94  
Date

Activity

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

DEPUTY CHIEF OF NAVAL OPERATIONS (LOGISTICS)  
DEPUTY CHIEF OF STAFF (INSTALLATIONS & LOGISTICS)

J. B. GREENE, JR.  
NAME (Please type or print)

J. B. Greene Jr.  
Signature  
14 SEP 1994  
Date

ACTING  
Title

210 R

NUWC Division Keyport  
Response to BSAT Request for Clarification  
BRAC 95 Data Call 5 Submission  
Revised pages 23-1R, 23-2R, 23-3R, 23-4R, 23-5R

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

NEXT ECHELON LEVEL (if applicable)

RADM Scott L. Sears  
NAME (Please type or print)

Scott L. Sears  
Signature

Commander  
Title

12 Sep 94  
Date

Naval Undersea Warfare Center  
Activity

~~I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.~~

~~NEXT ECHELON LEVEL (if applicable)~~

~~NAME (Please type or print)~~

~~Signature~~

~~Title~~

~~Date~~

~~Activity~~

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

MAJOR CLAIMANT LEVEL

~~NAME (Please type or print)~~

S. L. Steiner  
Signature

~~Commander~~

~~Naval Sea Systems Command~~

~~Title~~

9-21-94  
Date

~~Activity~~

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

DEPUTY CHIEF OF NAVAL OPERATIONS (LOGISTICS)  
DEPUTY CHIEF OF STAFF (INSTALLATIONS & LOGISTICS)

W. A. EARNER

NAME (Please type or print)

W. A. Earner  
Signature

Title

10/5/94  
Date

**BRAC-95 CERTIFICATION**

Reference: SECNAVNOTE 11000 of 08 December 1993

In accordance with the policy set forth by the Secretary of the Navy, personnel of the Department of the Navy, uniformed and civilian, who provide information for use in BRAC-95 process are required to provide a signed certification that states "I certify that the information contained herein is accurate and complete to the best of my knowledge and belief."

The signing of this certification constitutes a representation that the certifying official has reviewed the information and either (1) personally vouches for its accuracy and completeness or (2) has possession of, and is relying upon a certification executed by a competent subordinate.

Each individual in your activity generating information for the BRAC-95 process must certify that information. Enclosure (1) is provided for individual certifications and may be duplicated as necessary. You are directed to maintain those certifications at your activity for audit purposes. For purposes of this certification sheet, the commander of the activity will begin the certification process and each reporting senior in the Chain of Command reviewing the information will also sign this certification sheet. This sheet must remain attached to this package and be forwarded up the Chain of Command. Copies must be retained by each level in the Chain of Command for audit purposes.

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

**ACTIVITY COMMANDER**

NAME: Dennis K. Gibbs  
(Please type or print)

  
Signature

Commander  
Title

9 SEPT 1994  
Date

**NAVAL UNDERSEA WARFARE CENTER DIVISION, KEYPORT**

Activity

Addendum to Data Call #5 for Keyport submit (pages 23-1R, 23-2R, 23-3R, 23-4R, 23-5R, and 23-6R).