



DEPARTMENT OF THE NAVY
PORTSMOUTH NAVAL SHIPYARD
PORTSMOUTH, N. H. 03804-5000

IN REPLY REFER TO:
5510
Ser 100/035
01 Jul 2005

From: Commander, Portsmouth Naval Shipyard
To: 2005 Defense Base Closure and Realignment Commission (C. W. Furlow)

Subj: INFORMATION TO SUPPORT 1 JUNE 2005 VISIT TO PORTSMOUTH
NAVAL SHIPYARD

Encl: (1) Portsmouth Naval Shipyard Special/Unique Capabilities
(2) Special Programs, Portsmouth Naval Shipyard

1. Enclosures (1) and (2) are provided in response to your request for information during your visit to our facility. They contain information and pictures on the special and unique capabilities of Portsmouth Naval Shipyard and are considered an adjunct to the Command Brief presented during your visit.


J. C. IVERSON

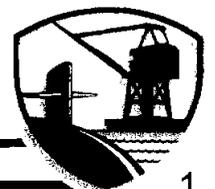
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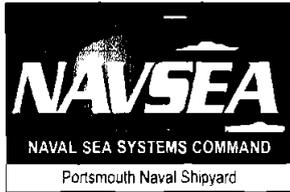


Portsmouth Naval Shipyard Special / Unique Capabilities

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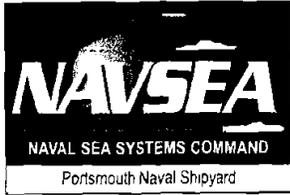


Special / Unique Capabilities

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- SHIP AVAILABILITY PLANNING AND ENGINEERING CENTER (SHAPEC)
- SPECIAL RUBBER PRODUCT DESIGN, MANUFACTURING AND TEST
- SUBMARINE BOW DOME BOOTING AND REFURBISHMENT
- PRECISION HULL MEASUREMENT USING VIDEOGRAMMETRY
- LARGE PLATE FORMING - STRUCTURAL FABRICATION
- WEAPONS SHIPPING TRUNK MOCK-UP
- LEAD CAULKING AND BONDING - STRUCTURAL FABRICATION
- TRIDENT PROPULSION SHAFT REFURBISHMENT
- AUTOMATIC PROPULSION SHAFT WELDING
- SHIPBOARD PROPULSION SHAFT MACHINING
- BALL VALVE (BALL AND SEAT) REFURBISHMENT
- VALVE AND PUMP TEST FACILITY
- ATTACK SUBMARINE BATTERY ACTIVATION, STORAGE AND REPLACEMENT ACTIVITY
- ANTENNA RESTORATION FACILITY
- 500KW SHIPS SERVICE MOTOR GENERATOR SETS REFURBISHMENT FACILITY
- ELECTRIC MOTOR VACUUM PRESSURE IMPREGNATION
- ELECTRIC MOTOR HIGH PERFORMANCE BRUSH TECHNOLOGY
- TRANSDUCER & HYDROPHONE REFURBISHMENT
- WIDE APERTURE ARRAY SONAR INSTALLATION AND SERVICING
- IN SERVICE ENGINEERING (ISEA) FOR AN/WLR-9 SONAR SYSTEM



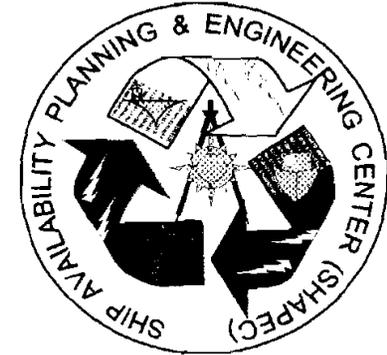


Special / Unique Capabilities

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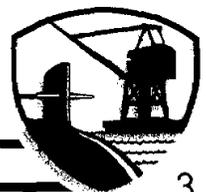
Ship Availability Planning and Engineering Center (SHAPEC)

Portsmouth Naval Shipyard's Engineering and Planning Department is assigned as the Ship Availability Planning and Engineering Center (SHAPEC) for Attack Submarines. SHAPEC was established by the Naval Sea Systems Command (NAVSEA) by Letter Ser 07/005 dated 8 September 1997, to accomplish the majority of non-nuclear advance planning for all depot level availabilities at Naval Shipyards, as well as at Electric Boat Corporation. This includes efforts to:



- Streamline the process for determining technical, planning and material requirements for ship work.
- Standardize technical planning products, practices and procedures.
- Ensure sharing and reuse of technical planning products by both public and private sector customers for depot level ship work and development of appropriate metrics.
- Implement corporate best practices and incorporate lessons learned to serve the "universal" mechanic.
- Establish/maintain libraries of reusable planning products for use by the fleet maintenance community.

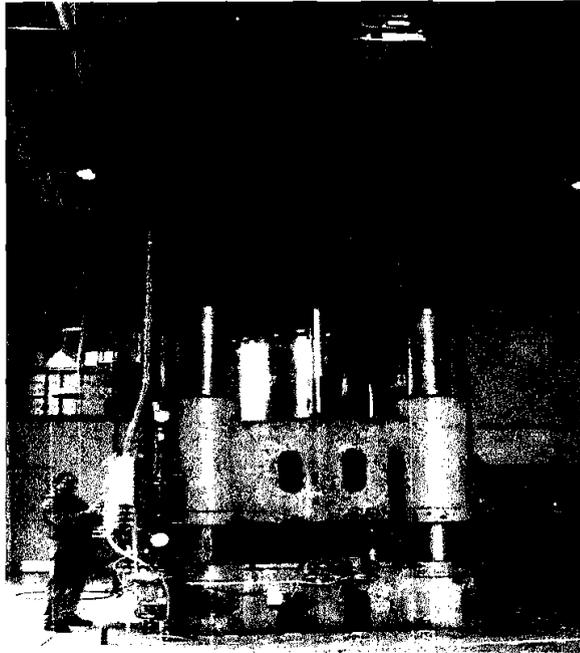
Currently, SHAPEC is working with NAVSEA to establish the technical framework for planning the VIRGINIA Class submarines to support the future maintenance infrastructure for the Navy.





Special / Unique Capabilities

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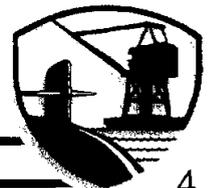


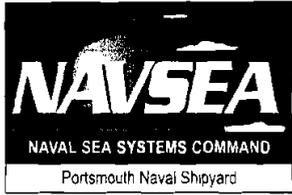
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RUBBER PRODUCT DESIGN, MANUFACTURING & TEST (NAVY WIDE)

PNS is the only complete rubber and plastic shop with the capability to design, manufacture and mold certified rubber products to meet the most stringent military standards from certified military formulas. Portsmouth also has the capability to modify formulas to achieve desired rubber characteristics, such as elongation, tensile strength, and durometer. Portsmouth is also the only certified navy activity that performs Teflon coating required for specific valve ball refurbishment.

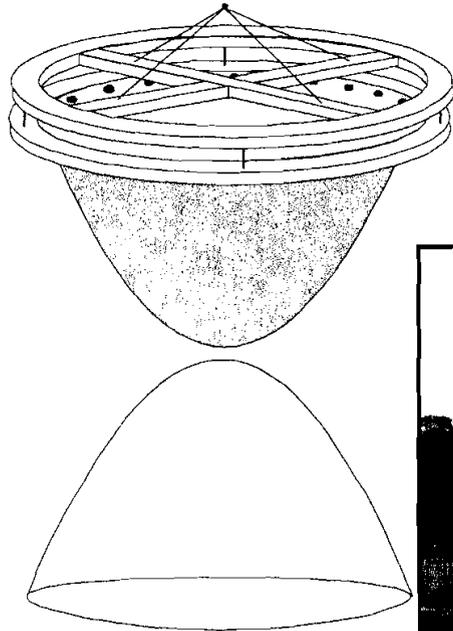
Portsmouth has the capacity to mold all sizes of O-ring molded gaskets up to an eight foot diameter, utilizing steam and electric presses that range from an electric 75 ton press to a 6,000 ton steam press with over 5,000 certified molds.



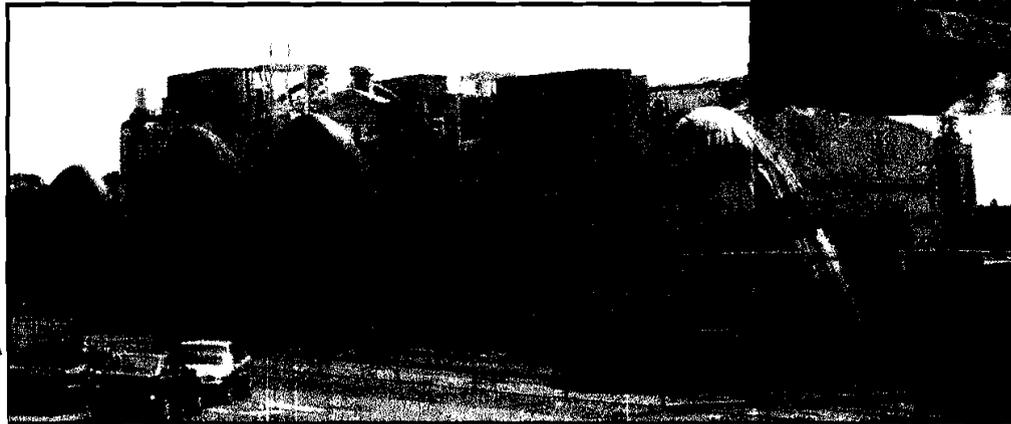


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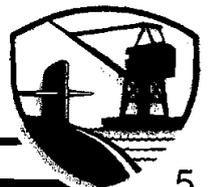


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SUBMARINE BOW DOME BOOTING AND REFURBISHMENT (NAVY WIDE)

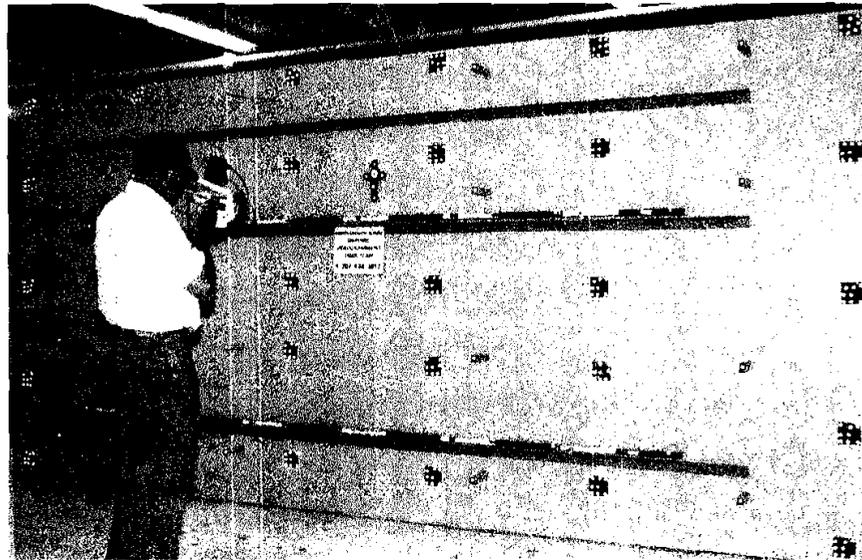
PNS is the only shipyard certified to perform submarine bow dome booting. PNS is also the only Naval shipyard that has the engineering expertise and trade experience to perform a full range of bow dome repairs, including rubber and GRP (glass reinforced plastic) repairs. PNS is the only Naval Shipyard with a facility set up to repair/boot submarine bow domes.





Special / Unique Capabilities

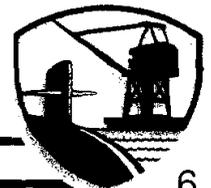
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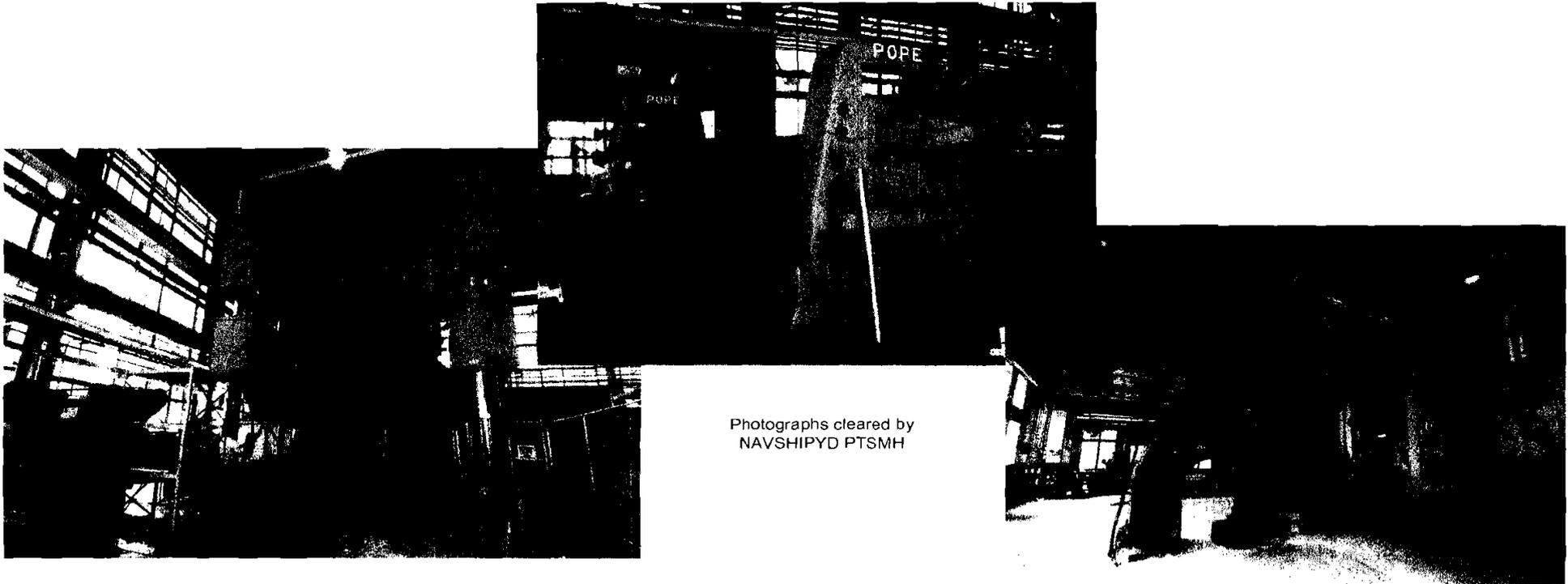
PRECISION SUBMARINE HULL MEASUREMENTS USING VIDEOGRAMMETRY (NAVY WIDE)

PNS is the only facility qualified by NAVSEA to accomplish partial circularity measurements using videogrammetry. Other shipyards contract with PNS to perform this service that provides significant savings to the Navy in terms of reduced interference removal. Other Naval Shipyards are acquiring this equipment in the future. Additionally PNS is in the process of becoming the only Naval shipyard qualified by NAVSEA to perform hull fairness measurements. PNS is developing a test plan with the Navy's Applied Research Laboratory for use of laser technology to measure ship structures.



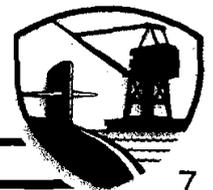


Special / Unique Structural Shop Capabilities For Official Use Only



LARGE PLATE FORMING - STRUCTURAL FABRICATION (NAVY WIDE)

Portsmouth Naval Shipyard's Structural Shop is the only with large plate forming capability, consisting of an 1,800 ton press, a 20 ton pope roll (capable of shaping large pieces of material 20 feet by 3 inch thick) and a 6 ton steam hammer capable of forging any type of material. This is primarily used for manufacturing hull sections and is used for USS Constitution repairs.





Special / Unique Structural Shop Capabilities

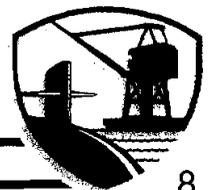
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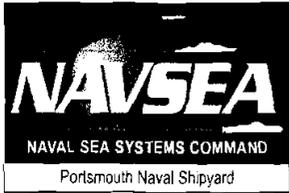


WEAPONS TRUNK MOCK-UP

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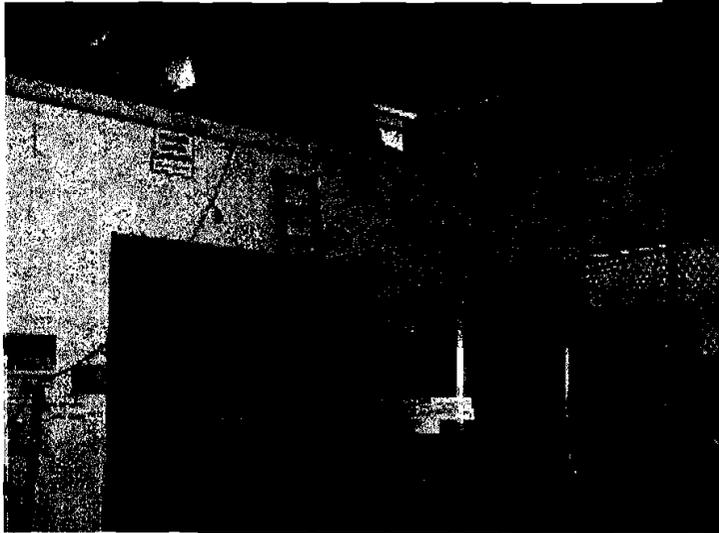
Portsmouth is the only activity in possession of a complete Weapons Trunk Mockup (WTM) with all attendant operating gear. The WTM is an actual trunk removed from a decommissioned Los Angeles Class submarine. At 15 tons, it is moveable, but shouldn't be considered portable. The WTM allows mechanics to train on all aspects of the trunk, including: rigging, painting, machining, and inspections, as well as other mechanical aspects not related to hatch work. Sailors from submarines undergoing overhaul at PNS are trained in WTM preventive maintenance and upkeep. An automated welding procedure is currently being tested on the WTM to implement a process improvement. Due to the high cost of repairs to the lower hatch, there is a new hatch machine in development for use by all shipyards. The use of this unique mock-up eliminates the high cost of training, during a submarine's overhaul, and dramatically reduces rework.





Special / Unique Structural Shop Capabilities

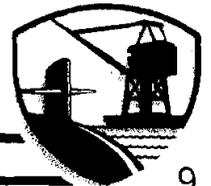
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LEAD CAULKING AND BONDING - STRUCTURAL FABRICATION (NAVY WIDE)

Portsmouth is the only Naval shipyard with qualified lead caulking and lead bonding personnel. PNS is the only Naval Shipyard that performs this type of work on the special structural panels. PNS personnel also perform this work at other Naval shipyards. PNS has a certified lead bonding facility.

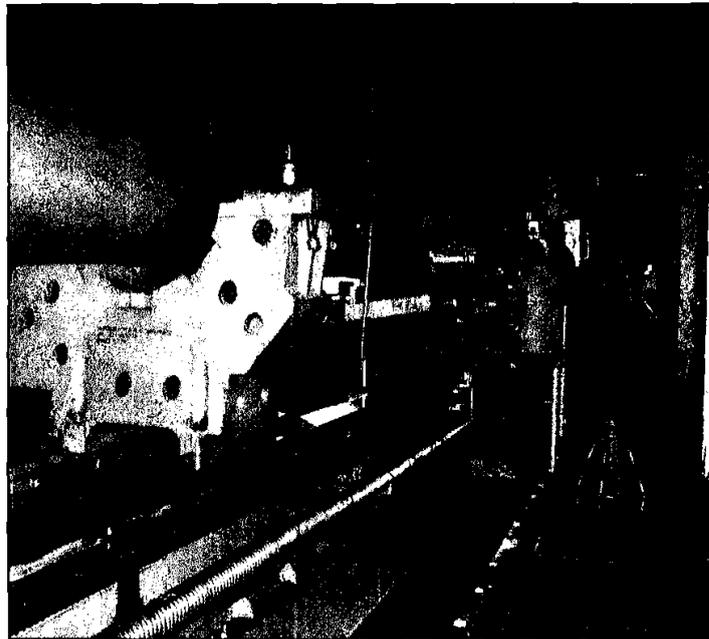




Special / Unique Capabilities

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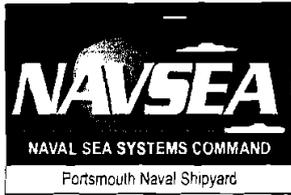
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TRIDENT PROPULSION SHAFT REFURBISHMENT (EAST COAST)

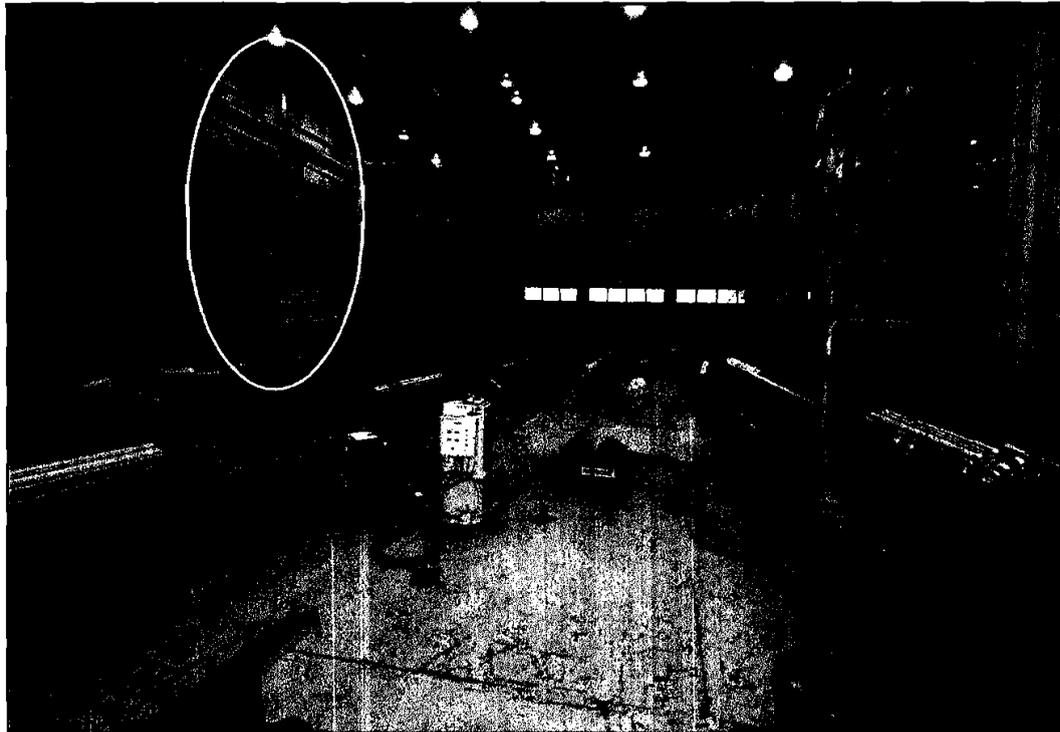
Portsmouth Naval Shipyard is the only Naval shipyard with a CNC shaft lathe. PNS is the only east coast Naval shipyard that performs Trident shaft overhaul and repairs. PNS has the capability to overhaul and repair Los Angeles Class, Trident Class and Virginia Class propulsion shafts. PNS has the capability to do shaft refurbishment for most surface ships (however, submarine shaft work typically takes priority).





Special / Unique Capabilities

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AUTOMATIC PROPULSION SHAFT WELDING (NAVY WIDE)

Portsmouth is the only Naval shipyard that has certified submerged arc welding processes that minimizes welding time while producing the highest quality. All other shipyards hand weld repair their shafts. This machine reduces time and eliminates defects in the final welded product. Shafts have zero welding defects using this method of welding.





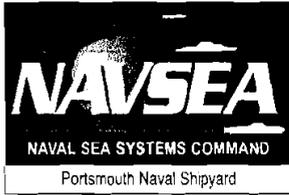
Special / Unique Capabilities

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SHIPBOARD PROPULSION SHAFT MACHINING CAPABILITY (NAVY WIDE)

Portsmouth is the only activity that provides in place machining of shaft seal grooves. This service is required once in the service life of the shaft (7 years). This repair requires approximately two weeks to accomplish, is performed with the ship dockside, saving the Navy the cost of dry-docking/shaft replacement (approximately \$2.5 million per submarine).

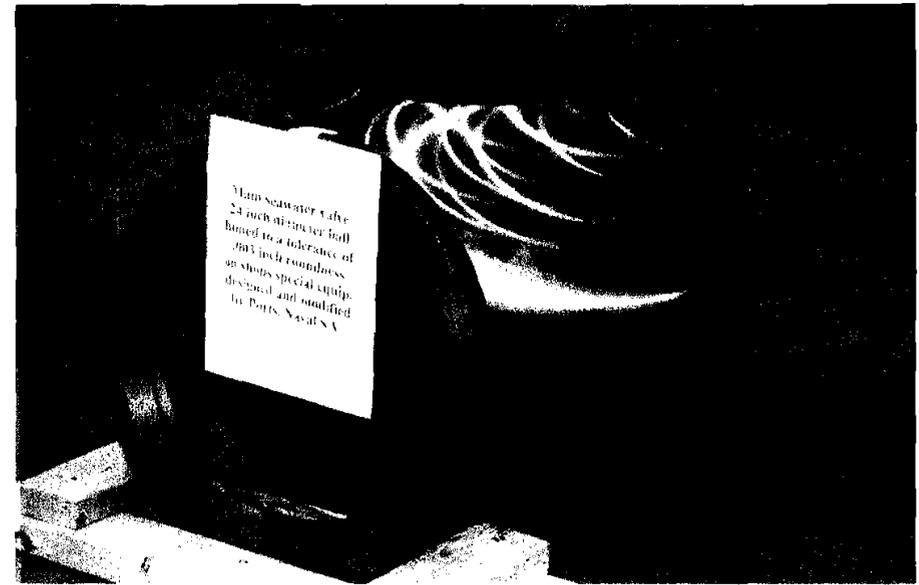
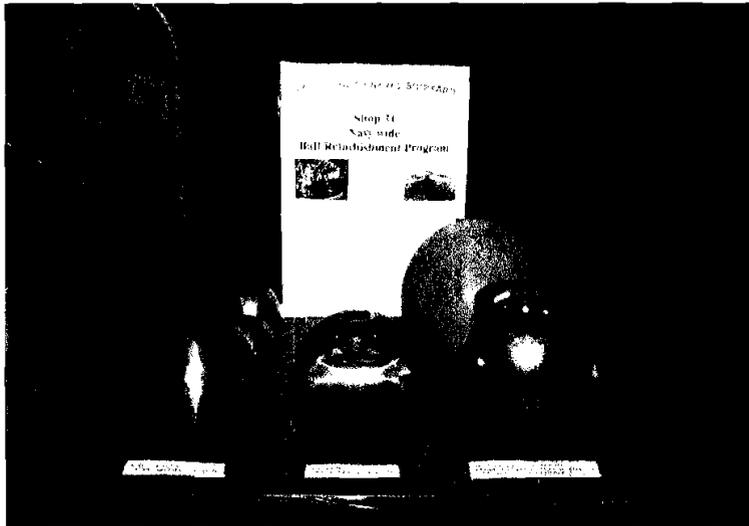




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BALL VALVE (BALL AND SEAT) REFURBISHMENT (NAVY WIDE)

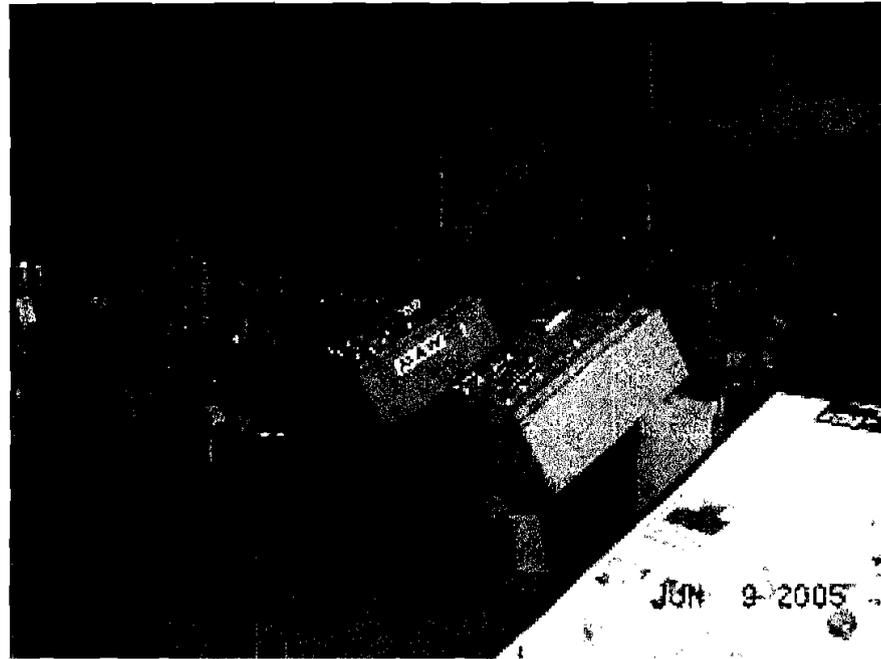
PNS is the sole Navy supplier of refurbished valve balls to the entire fleet (stock system) including all surface ships and all classes of submarines. PNS has the capability of honing all sizes of balls from one inch to twenty four inch diameter. PNS is currently honing approximately one thousand balls a year with the capability to increase that output to two thousand balls a year. Ball seats are also manufactured to fit the restored balls using a 3-axis CNC lathe that was purchased specifically to support this program.





Special / Unique Capabilities

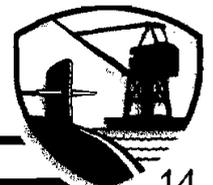
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VALVE AND PUMP FACILITY (UNIQUE TEST CAPABILITY)

Portsmouth is the only Naval shipyard that can test the Droitcour relief valves and AN/SPN-43 antenna drive gearbox valves because of the specific flow requirements for testing of these assets. The Building 300 valve and pump test facility can test any type of pump (surface or submarine).





Special / Unique Capabilities For Official Use Only

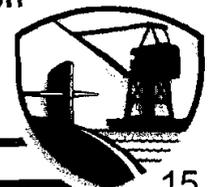


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SUBMARINE BATTERY ACTIVATION, STORAGE AND REPLACEMENT ACTIVITY (EAST COAST)

PNS is the only Naval shipyard on the east coast certified to replace Los Angeles Class submarine main storage batteries. Although PNS's primary replacement work is on Los Angeles submarines on the east coast, Portsmouth Tiger Teams travel to Connecticut, Virginia, South Carolina to perform battery replacements. Currently, PNS performs all east coast Battery (ASB&PDX styles) Storage, Wet-Down and Activation functions. Newly refurbished Battery Plant is the most up to date activation facility available within the Navy.

Portsmouth is the Navy's primary contributing engineering support facility in support of NAVSEA program to replace existing submarine batteries with the Valve Regulated Lead Acid (VRLA) batteries on Los Angeles and Seawolf submarines.

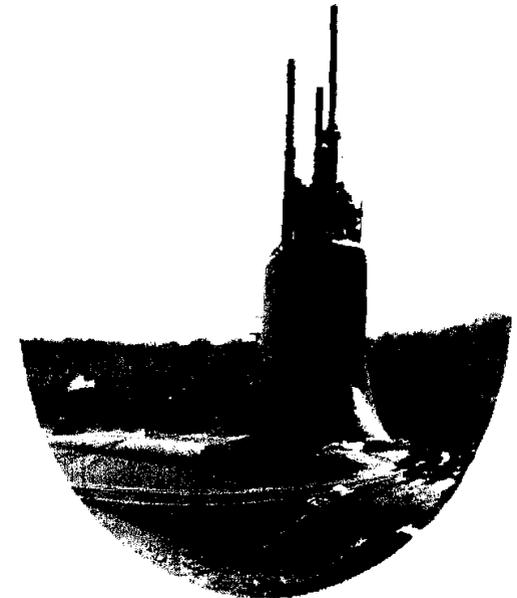
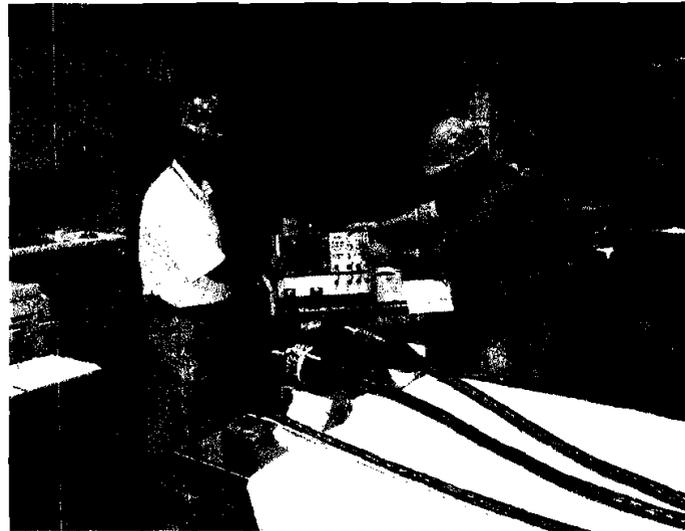
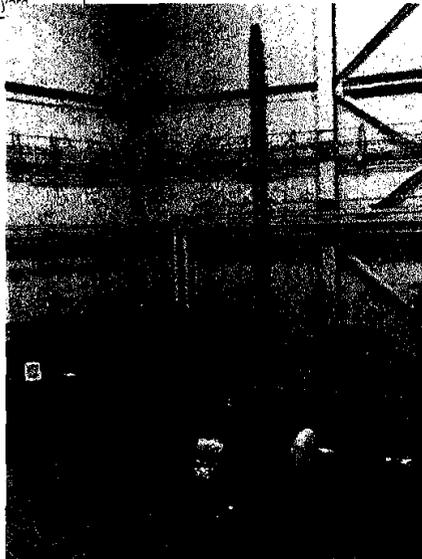




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ANTENNA RESTORATION FACILITY (NAVY WIDE)

The only certified Depot Level Submarine Antenna Overhaul Facility for the Navy. Designated Overhaul Point (DOP) for the overhaul, repair, testing and certification for multifunction RF Antennas in the Submarine Fleet. The ARF also provides DOP functions for other communication systems such as the BRT-6 UHF Expendable Satcom Buoy System, the BRR-6 Towed Buoy Radio Communication System and the CU-2364 Antenna Coupler. The ARF also provides overhaul, testing and modification services for NAVSEA, SPAWAR, NAVICP and the other shipyards.

In addition to an electronic ground plane system beneath the building foundation for sea surface simulation, the ARF incorporates an OSH approved electronic radiation enclosure to protect personnel during high power testing against the hazards of ionizing radiation. A hydraulically operated lift permits elevation of antennas in order to obtain the best possible radiation pattern. All antennas overhauled are pressure tested in three, various sized chambers, guaranteeing watertight integrity of units prior to final operational testing.





Special / Unique Capabilities

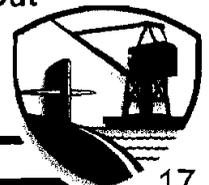
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500KW SHIPS SERVICE MOTOR GENERATOR (SSMG) SETS AND ROTOR REFURBISHMENT FACILITY (NAVY WIDE)

The only U.S. Navy certified for 500KW Motor Generator Set & Rotor Repair and Restoration Facility. The only activity certified to rewind New Design 500 KW dc armatures. Although full restoration of SSMG sets is performed by PNS, restoration of rotors for "Classic" and "New Design" Motor Generators installed on Los Angeles and Trident Class submarines is the most frequent repair required. By applying "LEAN" initiatives, this program eliminated an inherited workload backlog and provided Navy "Ready for Issue" (RFI) assets to support Fleet requirements. Facility engineers and technicians consistently travel to other shipyards and Naval maintenance facilities to monitor and/or effect emergent repairs. NAVSEA 07T and PMS-392 rely heavily on engineering expertise to solve problems throughout Fleet.





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VACUUM PRESSURE IMPREGNATION (EAST COAST)

The Motor Restoration Shop at PNS incorporates the only certified vacuum pressure impregnation (VPI) program on the east coast for performing VPI on Los Angeles Class submarine motors and motor generators. Vacuum pressure impregnation increases the reliability of electric motors and increases the longevity of the windings. The VPI certification process is approved by NAVSEA only after significant samples are processed with a repeatable success rate.





Special / Unique Capabilities

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HIGH PERFORMANCE BRUSH TECHNOLOGY (NAVY WIDE)

PNS and Noesis (private company) have partnered for five years to develop High Performance Brush Technology for electrical motors. High performance brushes will improve the quality of life onboard U.S. Navy ships and reduce fleet maintenance problems currently related to existing technology. Maintenance is reduced through improved brush wear rates, and in addition, non-invasive debris. PNS is the lead activity for this research project.

PNS has designed first of their kind modifications and procedures in support of this research. Electrical machines were initially modified with High Performance Brush Technology in a test lab at PNS. Once testing phases commenced, PNS developed technical documents to implement modifications on other machines and at other shipyards. Each modified motor tested at PNS has been monitored with automated computer instrumentation designed completely by PNS in support of this project. Because of their low cost and efficiency, these automation instrumentation packages have since been implemented in other areas at PNS.

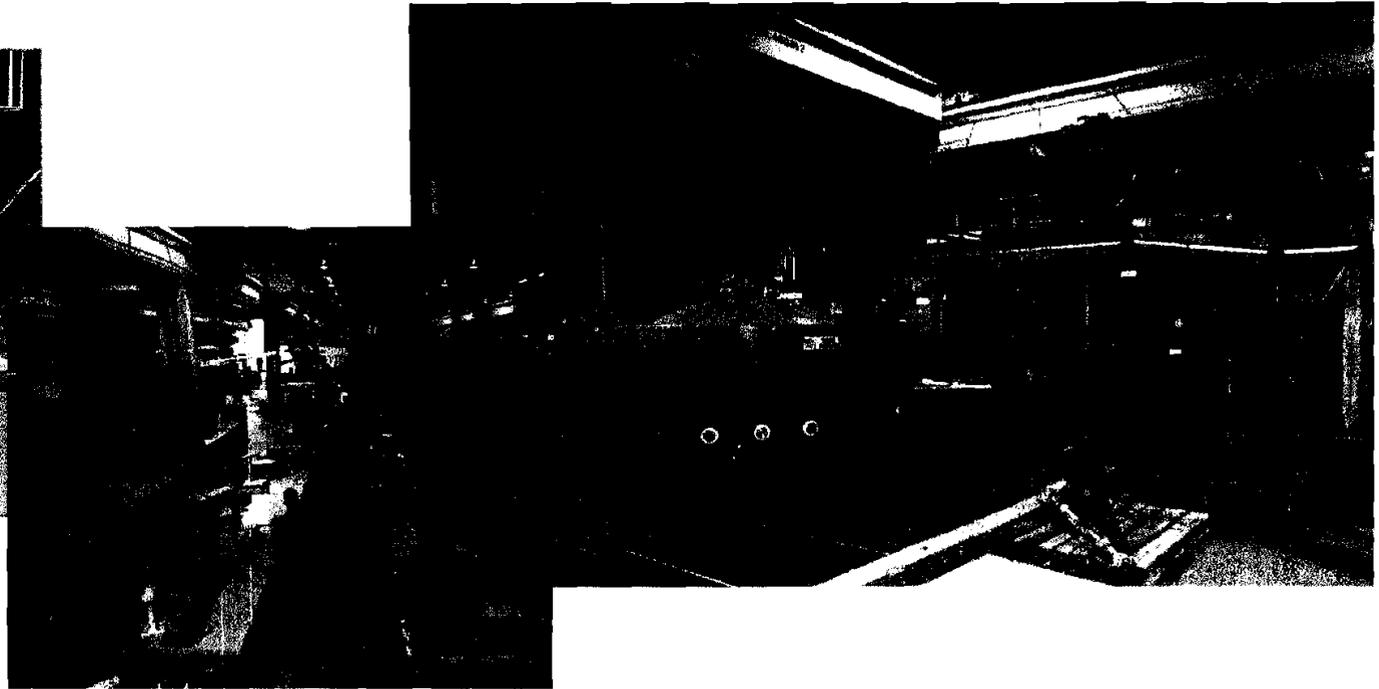
PNS makes supporting visits to other activities (PSNS, PHNS, TRF Kings Bay) as the technical experts in this technology. The research being done by PNS on High Performance Brush Technology has generated valuable knowledge and beneficial products for the Fleet.





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TRANSDUCER AND HYDROPHONE REPAIR FACILITY (NAVY WIDE)

The only U.S. Navy certified Transducer and Hydrophone Sonar Repair/Restoration Facility (TRF). Primary work is to support repair and restoration of sonar components for U.S. Navy submarines and surface ships as well as U.S. Coast Guard ships. Also supports Foreign Military Sales (FMS) submarines and surface ships for Taiwan, Italy, Saudi Arabia, Turkey and others. Naval Sea Systems Command (04) has mandated the U.S. Navy to maintain such capability within Navy. TRF has consistently demonstrated rapid response to emergent requirements for submarines and ships throughout Fleet. Currently has congressional approval to move forward with MILCON of a new state-of-the-art acoustic test tank valued at \$8.1M.





Special / Unique Capabilities

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PROGRAM EXECUTIVE OFFICER, SUBMARINES
400 JAGS BLDG STEET 14
WASHINGTON NAVY YARD DC 20374-7004

NAVY ID
1000
Ser 425/137
22 Nov 02

From: Program Executive Officer, Submarines (PMS925)
To: Commander Portsmouth Naval Shipyard

Subj: REPLACEMENT OF ACOUSTIC TEST TANK AT TRANSDUCER REPAIR FACILITY

1. The Transducer Repair Facility (TRF) at Portsmouth Naval Shipyard (PNS) is the only remaining government transducer repair facility. Although some transducer restoration is being done commercially there are several reasons for continuing government restoration:

- The TRF has repeatedly demonstrated a basic reliable transducer restoration capability combined with a rapid response to fleet emergencies.
- The TRF will repair any unit, regardless of quantity.
- The work force is experienced in a wide variety of transducer types.
- The existence of a government facility provides "built-in" competition for commercial restoration.
- TITLE 10, Subtitle A, Part IV, Chapter 146, Section 2464 states that "It is essential for the national defense that the Department of Defense maintain a core logistics capability that is Government-owned and Government-operated (including Government personnel and Government-owned and Government-operated equipment and facilities) to ensure a ready and controlled source of technical competence and resources necessary to ensure effective and timely response to a mobilization, national defense contingency situations, and other emergency requirements." In case of a national emergency, the TRF is a required facility.

2. Each restored transducer must pass specified in-water acoustic tests to verify its operating characteristics as part of the final acceptance test. Thus, transducer restoration requires an acoustic test facility. The existing facility, a redwood tank 55 feet in diameter by 40 feet high, is nearing the end of its life. The large size is required to provide

"...the only remaining Government transducer repair facility."

"In case of a national emergency, the TRF is a required facility."

Subj: REPLACEMENT OF ACOUSTIC TEST TANK AT TRANSDUCER REPAIR FACILITY

acoustically free-field conditions for the transducers typically restored at TRF. Transducer restoration cannot continue at PNS without a suitable test facility.

3. Knowing capital improvement funds are available at PNS, the TRF management plans to request that PNS replace the tank. PMS925 endorses this replacement under the PNS capital program. If the new tank is approved, PMS925 can provide technical support for the development.


D. A. VEATCH
CAPT, USN

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Portsmouth Naval Shipyard (R. Bellrose, Code 221.3)
NAVYMARCOMDIV Newport, RI (S. Cochran, Code 2131)

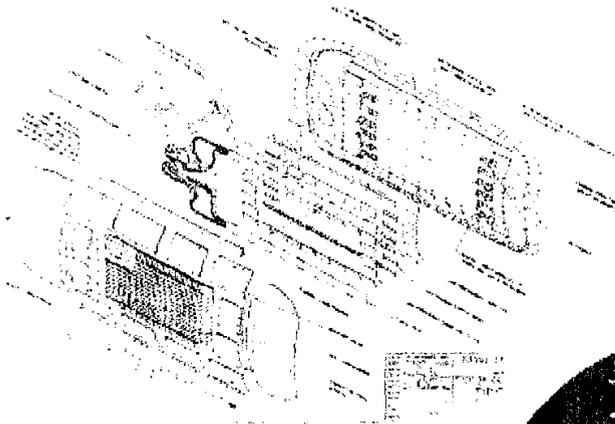
Project Endorsement from
Program Executive Officer,
Submarines
Washington Navy Yard, DC
D. A. Veatch, CAPT, USN



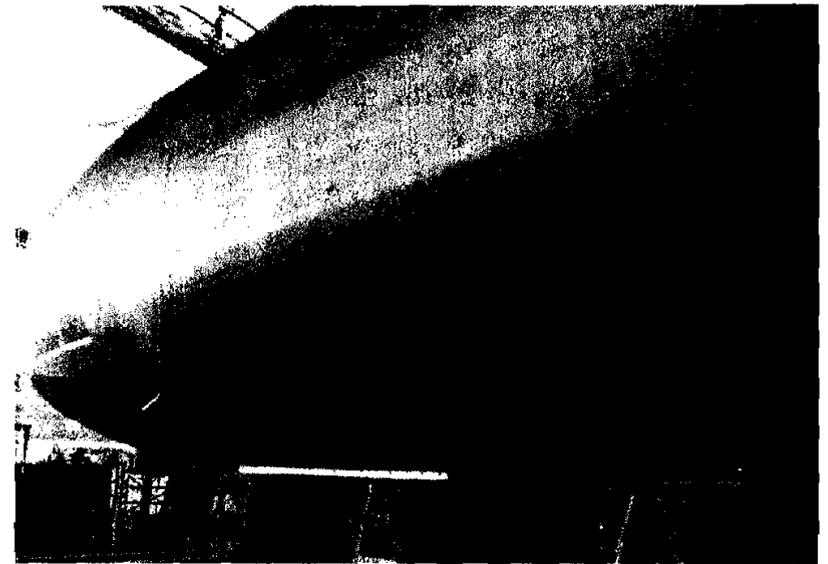
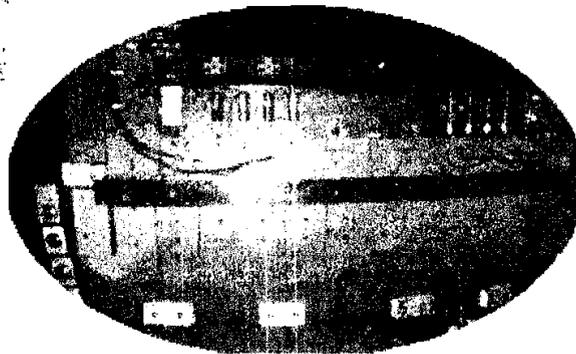


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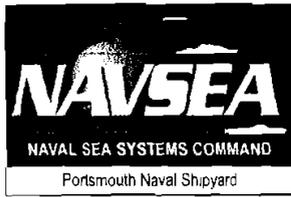
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WIDE APERTURE ARRAY SONAR INSTALLATION AND SERVICING (NAVY WIDE)

The only Naval shipyard that has the full range of experience with large-hull mounted submarine arrays. PNS is the lead shipyard for engineering, installation and maintenance of wide aperture arrays, and large hull mounted submarine arrays. PNS provides all technical direction, in-service maintenance, and repair/restoration of large hull-mounted submarine arrays. PNS is also the only Naval Shipyard performing installation of hull mounted conformal (CAVES) arrays.





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IN SERVICE ENGINEERING AGENCY (ISEA) FOR AN/WLR-9 SONAR SYSTEM (NAVY WIDE)

As an in service engineering agency (ISEA), PNS provides 24/7 support to the Fleet to repair the AN/WLR-9 Sonar System. PNS provides parts and engineering personnel to correct any and all problems with this system. Engineers and technicians are constantly in a travel status to effect emergent repairs anywhere. PNS is also assigned to help Naval Underwater Warfare Center (NUWC) install new/ temporary alteration to all types of submarines. PNS has also been requested to help do these types of installations on some surface ships.





Special Programs

Portsmouth Naval Shipyard

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Special Programs Portsmouth Naval Shipyard For Official Use Only

Advanced SEAL Delivery System:

The Advanced SEAL Delivery System (ASDS) is an autonomous combatant submersible capable of delivering U.S. Navy SEAL combat swimmers and their weapons to high threat environments. One of the many advantages the ASDS offers over previous delivery systems is the ability to keep the SEALs warm and dry in route to their mission. The Special Operations Community has proven to the Navy that use of this asset, in concert with with U.S. Submarine Force Community, fully supports the U.S. Navy's mission. Portsmouth Naval Shipyard (PNS) is uniquely qualified as the Planning Yard and Life Cycle Sustainment Manager for the ASDS program. Customers are SOCOM, WARCOT and the Special Operations Forces Undersea Mobility program office (NAVSEA PMS 399).

USS DOLPHIN:

USS DOLPHIN (AGSS 555) is the World's Deepest Diving Submarine. It was designed and built by Portsmouth Naval Shipyard and is the U.S. Navy's only diesel submarine. USS DOLPHIN is used extensively by the US Fleet for training. PNS retains the corporate knowledge for engineering and maintenance and is uniquely qualified as the of Planning Yard, In-Service Engineering Agent, and Configuration Manager.

Foreign Military Sales:

PNS is the only activity that performs structural analysis and inspections for foreign submarines to permit certification for rescue by U.S. Navy assets such as DSRV, Submarine Rescue Chamber (SRC) or SRDRS. PNS developed and published the Foreign Requirements Manual for submarine rescue. This manual is used by NATO Countries as well as other nations.

Submarine Rescue Diving and Recompression System:

The Submarine Rescue Diving and Recompression System (SRDRS) is the U.S. Navy's new submarine rescue system that will replace the existing Deep Submergence Rescue Vehicles (DSRV). The SRDRS will be transportable by truck and aircraft and installed aboard the nearest vessel of opportunity. SRDRS diving depth is 2,000 feet. It includes a Pressurized Rescue Module (submersible vehicle), a handling system, and surface decompression chambers. It will be the first U.S. Navy rescue asset to allow rescue and transfer under pressure. PNS is uniquely qualified as the assigned Planning Yard.



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Atmospheric Diving System:

The Atmospheric Diving System (ADS) is the first component of the manned rapid Assessment Underwater Work System segment of the Navy's new Submarine Rescue System (SRDRS). The ADS provides rapid response capability for Disabled Submarine (DISSUB) localization and assessment, hatch clearance, and emergency life support stores replenishment. It consists of one atmosphere diving suit rated to 2,000 feet of sea water with all accessories. It maintains a one-atmosphere interior pressure allowing the pilot to operate at 2,000 feet for extended periods and return directly to the surface without risks associated with decompression. Limbs of this new suit achieve diver-like dexterity at all depths. PNS has extensive experience and is uniquely qualified as the assigned Planning Yard.

Submarine Escape and Immersion Equipment:

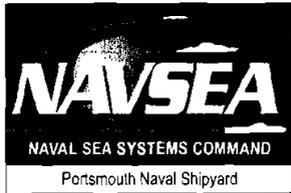
The Submarine Escape and Immersion Equipment (SEIE) is a combined whole-body suit and one-man life raft. It is designed to provide submariners protection against hypothermia and is replacing the current outdated device. The suit allows survivors to escape from a disabled submarine at depths down to 600 feet at a rate of eight or more men per hour. PNS is uniquely experienced and assigned as the In-Service Engineering Agent and has performed as the Installation Team Manager for all SEIE installs for SSN 688 Class submarines.

Research Submarine NR-1:

NR-1 is the U.S. Navy's smallest and deepest diving Nuclear Submarine. It is used for scientific research and information gathering. PNS retains the corporate knowledge and accomplishes all major maintenance. PNS is also uniquely qualified as the ship's Configuration Control Manager.

Submarine Rescue Chamber:

The Submarine Rescue Chamber (SRC) is the U.S. Navy's "inexpensive" work horse for submarine rescue capabilities. Albeit dated, the SRC is a proven capability in shallow depths to 850 feet of sea water. A similar device was used during the only successful submarine escape from the USS SQUALUS. A "fly-away" system, the SRC and its components can be transported by land, air or sea to anywhere in the world. PNS is uniquely qualified as the assigned Planning Yard.



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Deep Submersible Vehicle SEA CLIFF:

Although currently in a state of suspended certification, SEA CLIFF is classified as a manned, non-combatant, untethered submersible. With the ability to perform research missions at 20,000 feet of sea water, SEA CLIFF is capable of reaching 98 percent of the world's ocean floor. Full of electronic, life support, navigational and data collecting equipment, SEA CLIFF is well suited for research at extremely deep depths. PNS has extensive knowledge and is uniquely qualified as the Planning Yard and Configuration Data Manager for SEA CLIFF.