NAVAL TORPEDO STATION KEYPORT COMMAND HISTORIES, 1914–1974

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1909 - 1914

From 1909 to 1914, the Navy investigated every available location between British Columbia and San Diego for a still-water range suited for testing torpedoes and shipping them to the Pacific.

In June 1909, Navy personnel surveyed the land surrounding Keyport and in 1910 the waters adjacent to the Station were surveyed for depth, tides, etc. Keyport was selected as an ideal Pacific Coast site for a station to store, modify, repair and test torpedoes.

In June 1910 Congress appropriated $145,000 for the purchase of land, clearing and grading, protection of waterfront, wharf, firing, and observation stations; necessary buildings and equipment and employment of such civilian assistance as might be required.

In May 1913 the following article appeared in a Bremerton newspaper:

> "Keyport Torpedo Station is to be an important plant. It is promising and compares favorably with Newport. The site which is now being condemned will be a great institution. When the proposed torpedo station is established the shores of Puget Sound will possess another government workshop of more than ordinary interest and importance. Congress did not make a very large appropriation for this new establishment and for that reason its beginning will have to be more or less limited. Nevertheless the Chief of the Bureau

of Ordnance believes that the present appropriation will go a long way towards the establishment of a first class plant and that appropriations for its enlargement may be justifiably expected."

In July 1913 Secretary of the Navy Josephus E. Daniels visited the Puget Sound area and included Keyport in his tour of inspection. He was favorably impressed to the extent that he recommended not only the installation but future expansion. In later years the interest of Secretary Daniels in Keyport increased and through his efforts many improvements were made.

By condemnation proceedings 88 acres of hard land were purchased January 10, 1914, and the Station was formally commissioned in November 1914 as the Pacific Coast Torpedo Station.

The first Commanding Officer was Commander H. N. Jenson, USN, who reported aboard July 1914.

Adjacent to the southwest boundary of the Station was a lagoon and located on the shore was the Olympic Oyster Hatchery operated by the State of Washington. This lagoon was later acquired by the station and the hatchery dismantled.

Buildings acquired with the original purchase of land were Quarters D, B, and C (former farm houses), a Grange Hall, Store, and Post Office. These buildings were used for some time and finally demolished.

Quarters A and G (former farmhouses) are still being used as officers' quarters.

Building 16 was also acquired with the original purchase of land and is now being used as a tool shed.

1915

COMMANDING OFFICER: COMMANDER H. N. JENSON, USN

In May 1915, the first enlisted personnel (approximately 16) arrived aboard the Station and were housed and fed in the former Keyport Store and Grange Hall. Approximately eight civilians were employed during this year. Among the earliest employees was Louis M. Strom who had lived on a farm which became part of the Station. He retired in 1958 as the Master of the Public Works Department after having served at Keyport continuously for 43 years.

Building 1 was completed as the first permanent structure which provided office space, torpedo overhaul facilities, carpenter shop, machine shop, electric and pipe shops and space for a future power plant. This building is still in use housing the power plant, torpedo workshop, Industrial Relations and Training Offices.

The first torpedoes prepared at the Station in Building 1 were Whiteheads, manufactured for the U.S. Navy by the Whitehead Company of Woolwich, England, about 1896. They were powered by a 3-cylinder reciprocating type engine receiving cold compressed air from an air flask via a reducer. The designed range was about 800 yards at a speed of 27 knots. Wet gun cotton was carried in the warhead. The Station has one of these early Whitehead torpedoes on display for historical purposes.

During these early days, three or four men would obtain a torpedo from its stowage on one side of Building 1, transfer it by

hand to the other side of the shop, break it down, overhaul and re-assemble it and prove it on the range. Torpedoes were transported from the shop to the torpedo dock by hand-drawn carts. At this time the destroyer U.S.S. LAWRENCE was used as a firing ship since there was no means of supplying air for firing or charging torpedoes.

The oldest facility at Keyport is the range in Port Orchard Inlet which was used as early as 1913. Torpedoes from battleships being overhauled at the Puget Sound Naval Shipyard were loaded aboard the U.S.S. GOLDBOURGH and brought to Keyport for test firing.

At this time the Station's only water supply consisted of wells at each quarters operated by windmills or handpumps; water to the industrial section was piped from a spring. Construction began on Building 64 for water storage. Later water was piped to the quarters areas.

In 1915 the Station was supplied by outside power (2300 volts) but had no streetlights.

The only transportation to Keyport during this time was by boat or by horse and buggy. A stable, Building 17 (in use as quarters and gardener's storage) was constructed to house eight animals, a carriage room and stowage. The Commanding Officer was assigned a surrey for transportation. He met all visiting dignitaries arriving by boat with this vehicle.

Construction was commenced on the Torpedo Dock Pier 1. Building 11 was also constructed as a Target Shed or Ready and Service Shed for torpedoes. Building 11 is still used as a storage shed.

Visiting dignitaries:

Commandant, Thirteenth Naval District, RADM R. E. Coontz, USN

Rivers and Harbors Committee of the House of Representatives

1916

COMMANDING OFFICER	CDR H. N. JENSON	January - November
	LCDR BRUCE L. CANAGA	November

Personnel on board: 40 civilians

25 enlisted

The first contingent of Marines arrived and were housed in tents. With the exception of a short period following World War II, Marines were stationed at Keyport until 1 July 1958, when a civilian guard was established.

During this year overhaul and ranging of torpedoes on a minor scale was commenced and the following article appeared in a Bremerton newspaper in April:

> "As soon as sufficient trained men are available, the new torpedo station will be a busy place as everything is in readiness for operations. The first shipment of 32 torpedoes arrived this week and the testing range has been laid out."

Torpedo boat destroyer U.S.S. LAWRENCE was stationed at Keyport during the summer months to furnish compressed air and power for torpedo tests until a power plant was completed. At this time, by orders of the Assistant Secretary of the Navy, Franklin Delano Roosevelt, a civilian foreman Herman E. Boldt was ordered from Guam to supervise the construction and installation of the power plant

and other Station facilities. Mr. Boldt retired as Master Public Works Department in December 1946, having worked continuously at Keyport for 30 years.

Also in April 1916, the following article appeared in a Bremerton newspaper:

"Big cruiser will initiate Keyport station testing range. The U.S.S. SOUTH DAKOTA will initiate the new torpedo range at Keyport in the first tests of her torpedoes."

In January 1916, a radio station was installed; and although not an integral part of the Station, Keyport facilities were available to them. This radio station was funded by the Bureau of Engineering and consisted of a power station, Building 14, and two towers 400 feet high which were equipped with the latest radio improvements. Communications by air with Arlington, Darlene, Hawaii and Guam could be made thus establishing one of the first connecting links with the Nation's farthest island possessions. The first complement provided for a preliminary detail of some 50 men to assist in the construction and maintenance of the radio station and to assist Keyport in laying out the torpedo range. The following article appeared in a Bremerton newspaper in February 1916:

"Keyport station is developing into an important adjunct of Puget Sound Naval Shipyard. Not only will torpedoes be

stored and tested on the newly developed range but also the new high powered radio station there places this area in direct communication with other powerful government stations."

A barbed-wire fence was erected enclosing the entire Station. Sentry posts were distant and horses were provided the Marines on guard duty for patrol purposes.

Visiting Dignitaries:

Commander Reserve Forces Pacific Fleet and a U.S. Senator visited the Station for the purposes of securing firsthand information for preparing specifications and estimates for forthcoming appropriations.

1917

COMMANDING OFFICER	LCDR BRUCE L. CANAGA	January - November
	LT FREDERICK G. KEYES	November

Entry of the United States into World War I had little direct impact on Keyport. A few additional enlisted men, four yeomanettes and civilians were employed. The first civilian woman was employed as a storeroom keeper.

Improvements and new construction continued. New roads, magazines and Building 12 were constructed. Torpedoes were moved from Building 1 to 12 for storage and additional work benches were added in Building 1.

A narrow gage railroad was installed from Building 1 to the Torpedo Dock, Pier 1, and later extended to the freight wharf and other industrial areas. A battery-operated electric car was used on this track for transporting torpedoes. The first battery-charging equipment was installed in the north end of Building 1.

The water system was improved and extended; also a new 60-line telephone system installed with one trunk line to Puget Sound Naval Shipyard. The former telephone system consisted of a magneto telephone-hand-push-button bell system. The new switchboard was operated by yeomanettes and later by marines.

During this time the military laundry consisted of an open-sided roofed structure complete with buckets and scrubbing tables.

New 6600-volt power lines were brought in from Puget Sound Power and Light Company and a transformer was installed east of Building 1.

Other construction consisted of a Paint Shop, Building 21, and a dispensary. The latter building was converted into quarters (M), still in good condition, and used as officer's quarters. Quarters E and F were constructed and are still in use.

Building 3, 4, and 5 were erected this year. Building 6 was constructed as a warhead stowage and later used as a Boatswain's locker. The Freight Wharf Pier 2 was completed.

A power plant in Building 1 was completed and appropriations were granted for two high pressure air compressors, machine tools, woodworking tools, etc., for the other shops.

1918

COMMANDING OFFICER	LT FREDERICK G. KEYES	January - 7 July
	LT OTTO E. RHEA	7 July

Clearing the area for the present barracks was started. By this time the Power Plant was equipped with air compressors, three small generators and two Babcock boilers. A large hand-operated toll bell was placed on the roof of the power plant. This bell was tolled steadily for five minutes each morning as a work signal.

The first underground fuel oil line and storage tank was installed and overhead power lines to the Torpedo Dock.

Construction this year consisted of: Building 38 torpedo storehouse; Building 15 used as a lumber storage building; Quarters I.E-LW, IS-IN and H on Radio Hill. Building 13 originally constructed as a target shed later extended and used as a covered storage for boats. Building 23 originally housed a machine shop, welding and sheetmetal shop - later used as storage and civilian cafeteria. Building 24 was constructed for an Igniter Plant.

The Station acquired one Garford 1½ ton canopy truck, its first motor car.

Water facilities were still inadequate. A survey was made at Island Lake to determine the feasibility of piping water from that area. The Station finally drilled its own wells (one in 1919) and two 40,000 gallon elevated water tanks were constructed. A salt water fire circulating pump was installed and a 250 gpm pump installed which furnished pressured water in the event of fire.

1919

COMMANDING OFFICER	LT OTTO E. RHEA	January - 5 October
	CDR WILLIS W. BRADLEY	5 October

At the end of World War I there were approximately 65 civilians employed and in September there were approximately 31 enlisted men and 18 marines.

A Naval Affairs Committee consisting of twelve congressmen visited and the following article appeared in a Bremerton newspaper:

"The congressmen were especially pleased with the large area of adjacent water available for torpedo practice ranging."

In connection with the range, surplus deep sea submarine cable was obtained from the Army Signal Corps and was laid to the buoys; field phones were used for the first time instead of the previous system of flags.

Plans for additional radio facilities were completed to provide communication to the Orient via Vladivistock and Alaska. Construction was started in December on the largest wireless station on the Pacific coast with sufficient power to communicate as above outlined.

The freight dock was completed and the barracks, Building 35, was commissioned in May. The first athletic field was also constructed. Roads had been constructed to and from major Station areas but no sidewalks had yet been installed. Majority of transportation and freight to and from Bremerton was still by water since country roads were impassable a majority of the time. Building 47 was completed for storage, supplies, and the Plating Plant.

Quarters and barracks buildings were heated by individual coal-burning furnaces.

Two 5-ton Kelly-Springfield Army trucks were acquired.

Along with new construction, torpedo operations were also advancing. Most of the stored torpedoes were now out of Building 1 and it was used wholly for overhaul work. The shop was entirely manned by enlisted personnel; however, the first civilian ordnanceman (retired Navy) was hired this year.

Two steam cranes (15-ton railroad traveling) arrived in the north lagoon to unload sand and gravel from barges. Torpedoes were still lowered and raised on the torpedo dock by means of a hand crane. Two torpedo tubes were installed on a firing float for ranging torpedoes.

The first artesian well was drilled. It was 6" in diameter and 385' deep with an 80 gpm pump using an air lift.

1920

COMMANDING OFFICER	CDR WILLIS W. BRADLEY	January - 20 June
	CDR LLOYD S. SHAPLEY	29 May

There were approximately 80 civilians aboard.

The first torpedo school classes assembled. Men were sent to Keyport from all parts of the Fleet for three months instruction in torpedoes, ranging and classroom. These men were also trained to qualify for 2nd class divers. There being no recompression chamber at that time, the only recourse for the "bends" was to return the diver to his suit and send him back under water or transport him to Victoria, B. C. where a cable ship was located complete with recompression chamber.

Additional recreation facilities were established -movie projector, screen, bowling alley, pool tables and ships service store.

Stores began to arrive in quantities and the first storage area "bull pen" was erected in the vicinity of Building 47.

A triple torpedo tube was installed on the firing float and a 7000-yard torpedo range was laid out. The types of torpedoes being overhauled and ranged were Mark VIII and IX-1.

A gasoline dock was installed in the north lagoon and underground gas tanks for servicing trucks and retrievers.

Visiting dignitaries: Joint Congressional Party.

Buildings constructed:

Transportation Garage, Building 37; Storage, Building 39; Garage, Building 46; and Quarters J and K.

1921

COMMANDING OFFICER CDR LLOYD S. SHAPLEY

During this year construction, torpedo overhaul, and ranging progressed steadily.

Two more drilled deep wells were completed, one 6" in diameter and 707' deep and the other 8" in diameter and 535' deep.

As many as 105 military men were assigned from ships or on TAD for torpedo instruction.

Visiting dignitaries: Assistant Secretary of the Navy, Franklin D. Roosevelt.

Buildings Constructed: Warhead Stowage, Building 36; Pipe Shop and Storage, Building 40; and 400' radio tower.

1922

COMMANDING OFFICER	CDR LLOYD S. SHAPLEY	January - 6 July
	CDR WILLIS W. BRADLEY	5 July

This was CDR Bradley's second tour of duty at Keyport. He later became a congressman representing the state of California.

There were approximately 50 civilians aboard this year.

Torpedo classes ceased and the first experimental runs in a dynamometer tank was commenced for instruction purposes on the Mark VIII-3.

Private automobiles were being used by this year and the first parking lot was constructed by car owners donating one day's work -- the Station supplying the material.

The steam locomotive used on the narrow gage track was replaced with a small used air-driven locomotive since the locomotive caused many grass fires on the Station.

A fore-runner of the present Armed Forces Day celebration was initiated by having local teachers and school children visit the Station.

Visiting dignitaries: Commander-in-Chief of the British North American and West Indian Squadron, accompanied by 10 staff members.

Buildings Constructed: Boat Engine Maintenance, Building 48 and Marine Galley, Building N

1923

COMMANDING OFFICER CDR WILLIS W. BRADLEY

Regular and/or periodic internal and external Station inspections were established for industrial areas, boats, barracks, construction, U.S. Marine Corps and medical areas.

In September a fire, believed caused by spontaneous combustion, destroyed two-thirds of the roof of the barracks, Building 35; flooring in the north attic was damaged beyond repair and all rooms and dormitories in the north wing were damaged by smoke and water. There were no casualties.

Visiting Dignitaries:

Secretary of the Navy

Congressional party of 10

Chief, Bureau of Yards & Docks

Commander-in-Chief, U.S. Fleet

Commandant, U.S. Marine Corps

Building 140 was constructed, which included a spud locker, laundry, office, boiler room and ice plant.

In November, appropriations were received to enlarge the face of the torpedo dock pier 1, $15,000; enlarge the power plant, $10,000; and install a fresh water system, $12,000. Other appropriations included improvements to sewer system $5,000, and an addition to the storehouse for 640 additional torpedoes $42,000.

1924

COMMANDING OFFICER	CDR WILLIS W. BRADLEY	January - 25 August
	CDR HAROLD V. McKITTRICK	25 August

One person was sent to Newport, Rhode Island, to receive instruction in the manufacture/assembly of torpedo igniters. Upon his return, assembly of these items began.

Torpedoes were not only increasing in size by this time, but were also designated by different Marks and mods. The Group System of overhaul was instituted at Keyport.

The Igniter Plant and Stowage (Buildings 57A and B) were constructed and housed oxygen storage and recreation equipment respectively.

1925

COMMANDING OFFICER CDR HAROLD V. McKITTRICK

From 1914 until this year there had only been one fatal accident on the Station. This was considered to be a very good record in these early days in view of the hazardous operations such as blasting for land-clearing, handling explosives, net bombs with the very limited facilities, safety precautions and inexperienced personnel. A second fatality occurred this year. The two fatalities 1914-1925 resulted (1) from an explosion of a net bomb-cutter being disarmed -- these bombs or cutters were used on torpedo heads to explode upon contact with a net thus blowing a hole for the torpedo to pass through; and (2) a Puget Sound Naval Shipyard employee falling from a crane hook he was riding from a barge to the Torpedo Dock.

Since the country road to Bremerton and Puget Sound Naval Shipyard was still impassable a majority of the time, the Commanding Officer appointed a committee to look into the possibilities of having a State Highway Federal Aid Road built from Keyport to Bremerton. This committee consulted with government officials in Seattle and Portland but finally it was necessary to have a state representative in Congress request action by the Secretaries of the Navy and Agriculture. This eventually resulted in state legislation which authorized a highway to be built. This road was later extended to Kingston and Port Gamble, Washington.

Buildings 68 (Garage) and 78 (Incinerator) were constructed.

1926

COMMANDING OFFICER — CDR HAROLD V. McKITTRICK

Building 64 was extended for a fresh water pump house.

1927

COMMANDING OFFICER	CDR HAROLD V. McKITTRICK	26 January
	CDR THOMAS E. VAN METRE	26 January

Normal routine operations continued with no items of historical interest.

1928

COMMANDING OFFICER — CDR THOMAS E. VAN METRE

The first major torpedo conversion job was commenced which consisted of converting Mark 83-C torpedoes to Mark 83-D.

The first landscaping of the Station commenced and an underground water system was installed.

1929

COMMANDING OFFICER	CDR THOMAS E. VAN METRE	Jan - 23 Sept
	*CDR ROBERT C. GIFFIN	23 September

*Later Rear Admiral

The first expansion of the Station was made this year when 61 additional acres of land were acquired. Land was cleared by Station labor and the Igloo Warhead Storage area commenced. The fence line was extended to include the additional land to the southwest of the Station.

1930

COMMANDING OFFICER CDR ROBERT C. GIFFIN

The name of the Station was changed from Pacific Coast Torpedo Station to U.S. Naval Torpedo Station.

Building 71 was constructed to house electric warhead trucks.

Visiting dignitaries:

Chief, Bureau of Ordnance

Chief, Naval Operations

1931

COMMANDING OFFICER CDR ROBERT C. GIFFIN

The types of torpedoes being overhauled and proofed at this time were the Marks VII, VIII, and X.

Torpedo Storage Buildings 190 through 197 were constructed.

Visiting dignitaries:

U.S. Navy Commander-in-Chief U.S. Fleet

Inspection of the Station was made by the General Accounting Office.

1932

COMMANDING OFFICER	CAPT ROBERT C. GIFFIN	Jan - 18 June
	CAPT ALLAN S. FARQUHAR	18 June

No items of historical interest.

1933

COMMANDING OFFICER CAPT ALLAN S. FARQUHAR

No items of historical interest.

1934

COMMANDING OFFICER CAPT ALLAN S. FARQUHAR

Building 74 (used as an industrial and military dispensary) and Quarters P and Q were constructed this year.

1935

COMMANDING OFFICER	CAPT ALLAN S. FARQUHAR	Jan - 1 April
	CAPT JOHNATHAN S. DOWELL	14 June

As a result of air observations, it was noted the magazine area was noticeable. A planting project was commenced to cover the entire area with dark green ground cover which would remain essentially the same throughout the year.

An acid storage building (67) and Quarters R were constructed.

1936

COMMANDING OFFICER CAPT JOHNATHAN S. DOWELL

The freight wharf Pier 2 was completely overhauled and a new extension constructed at the end of the dock. The following buildings were also constructed: 72 Plating Plant; 73 Machine Shop; 77 Lumber Storage; S Commanding Officer's Quarters.

1937

COMMANDING OFFICER	CAPT JOHNATHAN S. DOWELL	January - 13 June
	CAPT WILLIAM A. HALL	29 June
Personnel on Board:	5 commissioned officers	
	3 chief gunners	
	1 pay clerk	
	1 USMC officer	
	75 enlisted navy	
	42 enlisted marines	
	92 civilians	

Commissary privileges (limited to stores generally carried in the mess) were in effect for military personnel living aboard the Station; surveyed laundry equipment from Puget Sound Naval Shipyard was obtained and installed in the barracks basement and functioned as a part of ships service. A branch library of the district was installed in the barracks.

A fire station and guard house, Building 76, at the main gate was constructed and was manned by military personnel.

All wiring in the industrial section was placed underground -- the balance of the Station wiring to be placed underground as funds became available.

The following type torpedoes were in store:

Marks VII-2A, 2B, 4A and 5

Marks VIII, VIII-1, 2, 2A, 2B, 3A, 3B, 3D and 4B

Marks IX-1, 3

Mark X

Mark XI

Mark XII

Following is a description of the Keyport proofing range in use at this time:

The range began at the firing point at the Torpedo Dock and extended southward in Port Orchard Bay providing a range of 7000 yards. This distance was in accord with O.D. Bulletin 710 which instructed that torpedoes subjected to a proofing range trial would be required to make one straightaway run of 7000 yards at a speed of not less than 27 knots, nor in excess of 28 knots, with an air charge of 1900 pounds per square inch. One torpedo from each lot of six must make an angle run of not less than 5000 yards. These instructions were limited to torpedoes Mark VIII and no longer range torpedoes had yet been proofed at this Station.

The range equipment included a firing float on which a deck tube was mounted. The float was moored on the south end of the dock and a control station built on the wharf. A spotting glass was used for following the torpedo -- this glass and other equipment was housed in a reconstructed control station.

The range was buoyed to provide a general reference line. Floats were moored at 3500 yard and 7000 yard points. The range control communications was provided by telephones at the firing point, the mid-range and extreme range points; however, the cable was old, badly grounded and unreliable. Procurement of 10 radio units was underway.

These would provide a radio receiver and transmitter at the firing point, one in each of the 5 torpedo retriever boats, one for the gig, one for each of the two range floats and one for the diving boat.

At this time the firing point of the range was too shallow for completely satisfactory firing. A mean low water depth of 20 feet allowed torpedoes to strike bottom on their initial dive. Improvements by dredging were being considered.

Torpedo recovery was accomplished by five motor retriever boats augmented by the gig. The Station had a small boat repair shop, a carpenter shop and machine shop with a complement of 5 enlisted men. Also, consideration was being given for an additional range. One range site in Elliott Bay on the eastern side of Bainbridge Island provided greater length; however, the drawback was that the depth of water was too great for recovery operation. A Bureau of Ordnance representative who visited the Station in January indicated the Bureau would not consider a range on which diving operations could not be readily carried on. Torpedo firing experience showed that torpedoes, properly tank-proved which did not strike the bottom on the initial dive, rarely failed to make a good run. Another site considered for an additional range was in Saratoga Passage in the vicinity of Coupeville, Whidbey Island.

The workload of the station this and recent past years consisted of the maintenance and overhaul of torpedoes in store averaging

around 1500. The modification and testing of torpedoes was accomlished as instructed by the Bureau of Ordnance. Assembling of igniters continued. Authority was received for the Station to manufacture small torpedo parts for issue, including manufacture of igniter parts.

Personnel on ships coming to Puget Sound Naval Shipyard for overhaul took advantage of the Station diving facilities for the qualification or re-qualification of divers. This service was extended to the Fleet and a letter to this effect was promulgated by the Commander-in-Chief, U. S. Fleet.

Dense woods and hills formerly on and surrounding the Station were eliminated and patrol roads built. To effect the major portion of this construction ERN, CCC and Keyport employees had been kept busy over a two-year period. CCC personnel spent more than 15 months on the base clearing land, grading and general landscape work. An article appearing in a Bremerton newspaper stated:

"Captain Dowell, Commanding Officer of the Naval Torpedo Station, has literally dug the station out of the forest and given it an entire facial. The improvements made will come to their full utilization many years hence."

Visiting Dignitaries:

Assistant Secretary of the Navy

Commander Battleship Battlefort

Commander Cruisers Scouting Force

24 members of the State of Washington Roads and Bridges Committee

1937 (continued)

Chairman and Associates (Congressmen and Representatives) of the House Appropriations Committee

1938

COMMANDING OFFICER CAPT WILLIAM A. HALL

Average number of civilians employed - 125. During this period the number of Emergency Relief Employees outnumbered the regular Navy Civil Service employees.

Visiting Dignitaries:

Chairman of the House Appropriations Committee

Ten members of the House of Representatives

Chairman Naval Affairs Committee

State of Washington Safety Engineer

1939

COMMANDING OFFICER	CAPT WILLIAM A. HALL
Personnel on board:	10 Commissioned Officers
	55 Enlisted Navy
	1 USMC Officer
	42 Marines
	170 Civilians

WPA, CCC and ERN crews continued to be employed with general construction and improvement projects.

In September security restrictions increased and all visitors were banned from the Station except those on official Navy business. A new photographic identification system was inaugurated for civilian employees.

Visiting Dignitaries:

Naval Affairs Committee, House of Representatives

Representative from Assistant Secretary of the Navy's Office

Representative from the Bureau of Yards and Docks

1940

COMMANDING OFFICER CAPT WILLIAM A. HALL

Average number of civilians: 225

The President of the United States ordered a speed-up in torpedo production, overhaul, proofing and issue. CTO Newport at this time was working round-the-clock. Keyport's civilian force began steadily increasing although hiring was accomplished one or two persons at a time through the Labor Board at the Puget Sound Naval Shipyard.

An appropriation of $175,000 was received for construction of a torpedo "overhaul" shop. An appropriation was also received for three additional magazines and miscellaneous public works projects. The first automatic fire alarm system was installed. A torpedo warhead loading shed was constructed, a cement mixing plant installed and paving of roads continued.

Visiting Dignitaries:

Secretary of the Navy, Frank Knox

Assistant Secretary of the Navy

1941

COMMANDING OFFICER CAPT WILLIAM A. HALL

Average number of civilians: 600

During this year, employees were hired daily a few at a time through the Puget Sound Naval Shipyard. Employment at Keyport increased to such an extent a housing project of approximately 300 units was constructed in the nearby town of Poulsbo. Employees began working a 7-day week with the 8th day off, and around-the-clock shifts were in force. Rigid security restrictions were enforced.

A Torpedo Class B Elementary School was formally established and in the succeeding 4½ years approximately 185 officers and 3,000 enlisted men were instructed in the operation, maintenance, assembly, dis-assembly and adjustments necessary to insure proper maintenance of torpedoes.

It is believed May 1941 was the first time a reward was offered and publicized in local newspapers for information leading to recovery of a missing torpedo. The reward was $25.

The 200 machinists at Keyport formed Local Machinists Union 285 this year.

Buildings constructed:

80 Igniter Plant

81 Exploder Shop and annex

142 100,000 gallon fuel storage

137 Garbage Depot

1942

COMMANDING OFFICER	CAPT WILLIAM A. HALL	January - 2 May
	CAPT THEODORE D. WESTFALL	19 May

Average number of civilians: 1100

The Station began hiring women to work in the industrial shops. Rationing of products and material commenced and the Station entered the period of attempting to obtain hard-to-get required materials and manpower essential to the war effort.

The United States Army established barrage balloon stations in areas surrounding the Station and anti-aircraft installations were established on Buildings 82, 76 and outside the Station.

The Station began the acquisition of 61.62 additional acres of land southwest of the Station proper.

The Class B Elementary Torpedo School, established in 1941, became an Advanced Torpedo School and this function was made a part of the Station mission.

Visiting Dignitaries:

Secretary of the Navy, Frank Knox

Buildings Constructed:

12 - Torpedo Storage (building extended)

82 - Torpedo Shop and Administration Building

83 - Public Works Shops

84 - Foundry (later converted to Heat Treating and Heresiting Building)

85 - Blacksmith and Pipe Shop

86, 87 and 88 - Magazines

94 - Barracks Building (temporary)

95 - Subsistence Building (temporary)

96 - Barracks Building (temporary)

97 - BOQ

101, 102, and 103 - Sewage Pump Houses

106 - 123 inclusive - Igloos

137 - Receiving Shed

162 - Cement Shed

166 - Storage

198 - Gymnasium (extension to Barracks Bldg. 35)

183, 184 - Quarters

T, U, V - Quarters

One 1135' deep well with 20" casing and 500 gpm

1943

COMMANDING OFFICER CAPT THEODORE D. WESTFALL

Average number of civilians: 1500

Female employment in shops was at an all-time high as more and more male employees were drafted or voluntarily entered the Armed Forces. Recruitment data and pleas for additional workers were continually published in newspapers. Part-time high school and college students were hired and working days increased to 13 days work, 1 day off. Workdays were round-the-clock shifts.

Prior to 1943, all recruitment and other personnel actions were accomplished by Industrial Relations of the Puget Sound Naval Shipyard. Due to continual hiring and turnover of personnel, a Personnel Office with a military billet of Personnel Officer was authorized and established at Keyport.

The acquisition of the 61.62 additional acres of land southwest of the Station was completed and construction started on a 500,000 gallon reservoir. Ten farm houses or cottages were acquired with the land and, due to the housing shortage, were converted into quarters.

200 additional housing units were erected at Poulsbo for Keyport workers and a small ferry boat began operating between Poulsbo and Keyport to transport these workers. This ferry, turned over to the government, was formerly in use at Brownsville - later, when the ferry service between Poulsbo and Keyport was abandoned, the Station used it as a firing barge.

Material shortages became very acute and rigid conservation measures enforced. A Purchase Division of the Supply Department was established for direct purchase authority under $500. Prior to this year, the functions of the Supply Dept. were limited to torpedoes and torpedo parts; all purchase requisitions for material, contracts, and Station maintenance were forwarded directly from the department concerned to the Supply Dept., Puget Sound Naval Shipyard.

The Safety Office became an established component with an allowance of one military billet as Safety Officer.

A civilian fire department was established with marines as auxiliary firefighters.

The U.S. Marine Corps at Keyport acquired a number of "war dogs" which were used to assist in patrolling the fence line.

In October, 131 apprentice machinists and toolmakers completed a two-year apprentice course. This course at Keyport had been compressed into two years instead of the customary four.

By this year, steam heat had been extended to all buildings of the Station with the exception of the quarters acquired with the recent land purchase.

Visiting Dignitaries:

Secretary of the Navy, Frank Knox

Buildings Constructed:

24 - Extended for use as a Torpedo School

91 - Paint and Oil Storage

92 - Oil House

93 - Gas and Oil Service

98 - AUW Shop

99 - Range Observation House Pier 1

104 - Truck Testing Station

105 - Storehouse

134 Decontamination Station

COMMANDING OFFICER CAPT THEODORE D. WESTFALL

Average number of civilians: 1999

During the past five years the working force at Keyport had multiplied 12 times. 42% of the civilian working force were women at this time.

In August 1944 Keyport received the Army-Navy E award. This award was personally presented to the station by the Chief of the Bureau of Ordnance, RADM George F. Hussey, Jr., for "high achievement in the production of war equipment." A portion of the letter from the Secretary of the Navy reads, "The men and women of Keyport are making an outstanding contribution to victory. Their practical patrio-tism stands as an example to all Americans and they have reason to be proud of the record they have set." Army-Navy E pins were presented to each civilian for this effort.

The station received a Thirteenth Naval District Certificate of Merit for Special Purchases of War Bonds.

Approximately 7000 torpedoes were proofed by Keyport this year and during peak periods as many as 100 torpedoes were proofed a day. A history and description of the Keyport Acoustic Range is included in Appendix. The following types of torpedoes were proofed during World War II:

Marks 7-2B; 10-3; 13; 18;15; 14 and 14-4.

Buildings Constructed:

94 - Well 4 and Pump House

179 - Storage Building

180 - Imhoff Tank and Sewage Disposal

APPENDIX

HISTORY OF THE KEYPORT ACOUSTIC RANGE

Torpedo speed, deflection and depth measurements were made by a visual system before the acoustic range was installed. A barge was installed at each 1000-yard point along the range center line. A buoy was also placed at a specified distance from the range center-line at each 1000-yard station. An observer on the barge would start a stopwatch as the torpedo passed between the barge and the buoy. A torpedo was qualified in deflection if it passed between two buoys placed at specific points on the range. Originally, depth was determined visually by the observer on the barge. Later, a net was lowered into the water and depth was then determined from the location of the hole made by the torpedo's pass through the net.

In January 1944, the Bureau of Ordnance requested that the Naval Ordnance Laboratory survey facilities at Piney Point, Maryland, and Keyport, Washington, for the purpose of ranging torpedoes Mark 13, 14, 15 and 18. This survey was to determine the feasibility of an acoustic tracking range at each of these locations. In May 1944, the Bureau of Ordnance allotted $100,000 to be used for the installation of an acoustic range at Keyport as a result of these surveys. The range was to provide speed measurement at the 500-yard point and speed and deflection measurements at 1000, 2000, 3000, 4000, 5000, and 6000 yards.

The Naval Ordnance Laboratory was responsible for the range design, procurement of material and installation of the equipment. This range was designed by John Treadwell. Keyport manufactured the hydrophone mounts, furnished the necessary auxiliary equipment and a limited number of personnel.

The installation of the acoustic range was begun in June 1944, under the supervision of personnel from NOL, and completed in September 1944. The elevator on which the submergible torpedo tube is installed was built in 1945. Maintaining the range in satisfactory operating condition was originally the responsibility of the Thirteenth Naval District Degaussing Officer; however, this responsibility was transferred to Keyport in April 1946. Three months after completion of the installation, hydrophone trouble developed from water leaking into some transformer housings; also dezincification of the hydrophone mounts was evident. The transformer housing was redesigned by NOL to provide more rigidity and better sealing. Also the material used in fabricating new transformer housings and hydrophone mounts was changed from naval brass to bronze.

Maintenance of the range was discontinued from 1947 to 1950 for lack of funds. In 1951, it was restored to normal operation with numerous improvements to reduce deterioration of underwater units from corrosion. In 1953, the cables between the firing tower and the junction box were replaced by a new set of cables buried in a trench above high water to eliminate excessive cable failure in this area.

In 1953 the Bureau of Ordnance transferred design cognizance of the three acoustic ranges from NOL to Keyport with the responsibility for maintaining and supplying the necessary repair parts.

For experimental testing of Torpedoes Marks 27-4 and 35, speed and deflection hydrophones were installed at the 1500-yard point in February 1955. Depth hydrophones were installed at the 1000-yard centerline point in February 1954 and at 4000 yards in May 1956. 800-yard offset stations were added to the range at the 6000-yard and the 5000-yard points in August 1954 and September 1956, respectively, for measuring circle diameters of Torpedo Mark 16.

Original amplifiers and recorders were replaced in June 1959 by a new console to provide more accurate recordings, eliminate inherent recording difficulties and provide for easier operations.

1944 (continued)

It was about this time that the Applied Physics Laboratory of the University of Washington (APL/UW) became associated with Keyport. Because of the erratic torpedoes being issued to the Fleet in 1943, they were commissioned to create a more reliable exploder for these weapons. APL/UW was keenly interested in the experiment and development of underwater weapons, components and tracking systems.

1945

COMMANDING OFFICER CAPT THEODORE D. WESTFALL

Average number of civilians - 1825. This average soon decreased to 1700 and less with the ceasing of hostilities in August. The peak of employment during World War II reached 2035 civilians and 821 military.

The Station again received the Army-Navy E award for its contribution to the war effort.

During World War II, Keyport assembled over 2000 steam torpedoes and tested many thousands more.

In October, the Chief of the Bureau of Ordnance released the following information to the public:

"Keyport as is generally known here was not established as a torpedo manufacturing plant although during recent war years it did accomplish assembly manufacturing from parts fabricated elsewhere. No torpedo manufacture can be undertaken until research and development offer a torpedo so markedly superior to those now on hand as to warrant a request for funds. When such occasion arises pure manufacture will probably be concentrated at naval ordnance plants designed and equipped for manufacture of all types of torpedoes. As the Navy's largest torpedo station - differentiated from ordnance plants, Keyport should have a permanent civil service complement of 580 to 650 employees, 21 officers and approximately 136 enlisted men. Keyport will continue

its former function of overhaul, store and issue of torpedoes for ships on the west coast; also to proof and test certain torpedoes and to perform ensuing post-range overhaul together with the assembly and reloading of igniters."

Keyport received a Thirteenth Naval District Certificate of Merit for Special Purchase of War Bonds this year.

The Torpedo School, in operation since 1941, was discontinued. Over 3000 military personnel graduated from the school.

The railroad spur at U.S. Naval Ammunition Depot, Bangor, was completed and Keyport was no longer dependent upon material and weapons being transported by barge and other water facilities.

As of June a total of 1,082,200 man-hours were worked without a lost time accident.

Building 181 Ladder Storage was constructed this year.

1946

COMMaNDING OFFICER	CAPT THEODORE D. WESTFALL	January - 3 September
	CAPT CARL H. BUSHNELL	7 October

Prior to taking over the command of Keyport, the new Commanding Officer had been skipper of the U.S.S. PENNSYLVANIA and had recently returned from the first OPERATION CROSSROADS TEST. During the ensuing months he was called upon by many military and civilian agencies and groups to speak of and explain the above operation.

During the Spring, drastic reductions in personnel and funds commenced and the Station reduced its working force from an average of 1800 in 1945 to 416, and this year to 275.

Keyport received the Bureau of ordnance Naval Ordnance Development Award. In December, the Applied Physics Laboratory of the University of Washington (APL/UW) and 110 of its former and present staff members were honored by the Navy with an E award for development of a new type torpedo exploding mechanism. This proved highly successful and was a definite asset in the war effort. The development of the Torpedo Exploder Mark 9 was the beginning of a series of coordinated efforts between APL/UW and Keyport in the field of improving weapons and systems.

By orders of the Chief of Naval Operations and the Bureau of Ships, decommissioning of the Radio Station was authorized. Keyport acquired the five quarters, Building 14 and other facilities. The radio towers were later dismantled and two were transferred to the Radio Station, Bainbridge Island.

Visiting Dignitaries:

Representatives of the House of Naval Affairs Committee

Executive Secretary of the House of Representatives Appropriations Committee

Chief of the Bureau of Ordnance, RADM George F. Hussey, Jr.

Structure 182 (Grandstand) was constructed this year.

1947

COMMANDING OFFICER CAPT CARL H. BUSHNELL

Average number of civilians: 275

Information was issued to the public of the efforts being made by the Navy to perfect a "target-seeking electric torpedo."

The Station received the following awards:

Secretary of the Navy Achievement Award in Industrial Safety

Commendation for being the first base activity to attain 100% in the current Red Cross drive

Visiting Dignitaries:

Commander Western Sea Frontier and party

1948

COMMANDING OFFICER CAPT CARL H. BUSHNELL

Average number of civilians: 351

In November, Keyport was cited by the Secretary of the Navy in a personal letter for its attainment of 100% bond participation. Keyport was the first Naval activity in the United States to receive this honor. It was an enviable record and congratulations poured in from other Naval shore establishments and dignitaries. An official representative of the United States Treasury Department presented a Minute-Man Flag to the Station. These ceremonies were attended by dignitaries of the Naval Base and Thirteenth Naval District.

In May, the Commanding Officer was honored by being appointed as an honorary commander of the Military Division of the Order of the British Empire for cooperation with the Royal Navy in torpedo design. This was conferred by the British Counsel in Seattle.

For the first time in Keyport's history, an "open-house" was celebrated on Navy Day. The Station was open to the public for for inspection; displays were set up in various shops, a diving exhibition was held and two torpedoes fired for visitors. The U.S. Marine Corps also held a simulated marine attack demonstration in the athletic field.

This year also began a series of Keyport hosting various local groups such as the Lion's Clubs, Chambers of Commerce, Kiwanis, etc.

It was about this time when the Mobile Diving Unit came into being. This unit consists of diving equipment, recompression chamber and other diving facilities placed aboard a truck. There are no actual dates of the authorization or assembling of this unit since the original was initiated by enlisted divers during World War II. These men salvaged scrap, acquired surplus material from ships, stations and yards and did the actual construction job themselves. Upon completion this equipment was placed aboard a "surplus" truck and for some time thereafter the unit was used primarily for Keyport operations only. Soon this unit was called upon by nearby local Naval activities and civilian agencies -- its fame soon spread and during the ensuing years has travelled thousands of miles throughout the states of Washington and Oregon to assist in Naval and civilian disasters and emergencies. Its operation since was included as a part of the Station's mission.

1949

COMMANDING OFFICER CAPT CARL H. BUSHNELL

Average number of employees: 337 (minimum 217)

In 1948-1949 it became apparent that our torpedo ranges in Port Orchard Inlet and Hood Canal were much too shallow to test the deep running anti-submarine weapons which were then coming off the drawing boards. A nation-wide search revealed that the only protected body of deep salt water that would lend itself to a torpedo testing range was near Keyport in Hood Canal and Dabob Bay. The site was selected for its favorable oceanographic features such as 600' water depth, lack of tidal currents, man-made noises and other characteristics. During 1949, permission was obtained from the Secretary of the Army, through the Army Corps of Engineers, for the Navy to conduct operations in Dabob Bay and Hood Canal. This followed public hearings at Quilcene, Washington, at which many property owners and other citizens voiced opposition. About this time the Applied Physics Laboratory of the University of Washington was developing for the Navy a system to track underwater vehicles accurately in three dimensions.

Although Navy Day was no longer officially observed, Keyport again held "Open House" for visitors, repeating the displays and demonstractions held in 1948. The local newspapers contained pictures and a generous write-up of this event.

In December, 56 Keyport veterans whose combined government service totaled 1330 years were cited in a special ceremony.

Keyport continued its 100% bond participation.

Inspections of the Station were made this year by the Inspector General and an Industrial Survey (Organization and Administrative Procedures) was made.

Visiting Dignitaries:

Commander Western Sea Frontier

Secretary of the Navy, Francis P. Matthews

Undersecretary of the Navy

Deputy Chief of Naval Operations

Four officers from the Turkish Navy

1950

COMMANDING OFFICER CAPT CARL H. BUSHNELL

Average number of civilians - 221. During this year Korean hostilities occurred and hiring of civilian employees was accelerated to an average of 626 in 1951. Military personnel averaged 50 Naval and 50 Marines.

In April, due to economy, the U. S. Naval Torpedo Station, Keyport, and the U.S. Naval Ammunition Depot, Bangor, were directed to consolidate into one command to be known as the U.S. Naval Ordnance Depot, Puget Sound, with headquarters at Keyport.

The Commanding Officer was directed by the Commandant Thirteenth Naval District to prepare and present to civilian agencies (historical societies, local clubs, Chambers of Commerce, etc.) a presentation, "The Part the United States Navy has Played in the Development of Kitsap County."

100% bond participation continued.

The first Advanced Underwater Weapons Team authorized by Bureau of Naval Personnel arrived on the Station. This team consisted of one officer and approximately ten enlisted men. These personnel set up a training program for Station ordnancemen and newly employed electronic technicians and radio mechanics. Prior to this time only Torpedoes Marks VII-2B, X-3, XIII, XIV, XV, XVIII and XXIII had been proofed. The first acoustic torpedo to arrive on the Station was the Mark 27-0; later Marks 21-2, 27-4, 34-1 and 35-1 were proofed.

Evaluation runs for Ordnance Research Laboratory on the Torpedo Mark 21 commenced on the shallow water range and later at Hood Canal. The Mark 34 shop in Building 98 was established. Work also commenced on the Mark 24 Mine Vehicle.

The need was established and hiring was begun of a professional staff of graduate engineers for work associated with the more sophisticated electronically-controlled torpedoes.

COMMANDING OFFICER	CAPT CARL H. BUSHNELL	January - 30 June
	CAPT JAMES A. PRICHARD	18 June

Average number of civilians: 626

The Station received an award from the Secretary of the Navy for its Lost Time Accident Record.

It was during this year the Station began publishing information in local newspapers regarding forthcoming torpedo firings in order to clear the areas of boats and to notify the public of these operations in advance.

Visiting Dignitaries:

Three Canadian Naval Officers aboard to study "American Navy Know-How".

Buildings Constructed:

185 Simulator Building (for testing Mark 9 influence exploders).

186 Acid Storage Building.

1952

COMMANDING OFFICER CAPT JAMES A. PRICHARD

Average number of civilians - 916

military - 384

A record of 2,366,876 man-hours without a lost time accident was established. This feat placed Keyport at the head of all Naval establishments. The Station received an award from the Secretary of the Navy for operating the entire calendar year without a lost time accident and also an award for Achievement in Industrial Safety.

In May, the separate commands of the U. S. Naval Torpedo Station and the Naval Ammunition Depot, Bangor, were reestablished; the U. S. Naval Ordnance Depot, Puget Sound, being abolished.

Work was commenced on Torpedo Mark 32-2.

1953

COMMANDING OFFICER	CAPT JAMES A. PRICHARD	January - 1 August
	CAPT H. A. PIECZENTKOWSKI	18 September

The Station again made an outstanding record in operating 3,171,986 man-hours without a lost time accident (1951-1953). A Secretary of the Navy Award for Safety and Achievement in Industrial Safety was received as well as a National Safety Council Award of Honor and a Secretary of the Navy Motor Vehicle Safety Award.

A civilian billet was authorized for the Safety Department, replacing a full-time military billet.

Full usage was realized with the facilities constructed at NAD Bangor and vicinity in support of Keyport operations, such as an Advanced Underseas Weapons Building, observation towers and a small-craft wharf.

Keyport at this time was proofing weapons on three ranges -- Keyport, Hood Canal and Dabob Bay. A maximum of 900 weapons proofed per month. New weapons were the Marks 43-0, 43-1, 28-1 and 28-2.

1954

COMMANDING OFFICER CAPT H. A. PIECZENTKOWSKI

Average number of civilians: 994

A civilian billet was authorized for the Head of the Industrial Relations Department replacing a full-time military Billet.

In May, a flash fire, probably started by a cigarette in a waste basket, occurred in the Naval Barracks which claimed the life of one enlisted man and injured six others.

In August the Station held its first Salmon Derby sponsored by the Employees Services Association, which became an annual affair.

The Automotive Cost Control Program was installed at the Station for all transportation equipment.

80,000 cubic yards were dredged from the torpedo range immediately south of Pier 1. This dredged material was used to fill in the north lagoon and added approximately 2.37 acres of land to the Station. The area was subsequently used as a parking lot.

Secretary of the Navy Motor Vehicle Safety Award and Achievement in Industrial Safety was received.

Armed Forces Day celebration at the Station included "Open House" with three torpedo firing exhibitions and two diving exhibitions. Japanese, German and U.S. torpedoes were on display and several shops had displays of their own. The Station also had window displays, one in Bremerton -- a scene depicting a diver searching for a lost torpedo, and two displays in Poulsbo -- a torpedo display and a weapon display.

1955

COMMANDING OFFICER	CAPT H. A. PIECZENTKOWSKI	January - 21 July
	CAPT JAMES A. PRICHARD	18 June

Average number of civilians - 980

military - 300

CAPT Prichard, who served as Commanding Officer from June 1951 through July 1953, returned for a second tour of duty as Commanding Officer. RADM F. S. Withington, Chief of the Bureau of Ordnance, attended the Change of Command ceremonies this year.

In January, a stripped LST formerly operated under the Far East Command was received by the Station for use as a torpedo target. The USS RAZORBACK conducted operations in Hood Canal and torpedoes were also fired at this "target" submarine.

By this year, the feasibility studies, basic engineering work and construction of the necessary components were completed for the 3-D Tracking Range at Dabob Bay by the Applied Physics Laboratory of the University of Washington.

Funds were authorized for the construction of a Quality Evaluation Laboratory and a Navol Storage Building.

Following the new Navy concept on Comptrollership, the comptroller functions were separated from the Supply Department and a civilian head was installed as Comptroller.

Passive Defense Training was given to all civilian and military personnel of the Station including members of their families who cared to attend.

The first credit union was established this year for Keyport employees.

Military personnel from Keyport actively participated in the Seattle Television Show, "March On."

The Station was proofing Torpedoes Mark 27-4, 28, 32-2, 34-1, 35, 43-1 and the Mine Vehicle Mark 1 Mod 1, and accomplishing conversion of Mine Vehicles Mark 1-0 to Mark 1-2.

Visiting Dignitaries:

Secretary of the Navy, Charles S. Thomas

Assistant Secretary of the Navy, Thomas S. Gates

On-site Survey Inspection Team

Management Evaluation Inspection Team

Maintenance Cost Control was established in the Public Works Department and preventive maintenance inspections put into effect on all Station facilities.

The Keyport Diving Team received a special commendation from the Commandant, Thirteenth Naval District, for salvage work accomplished. Keyport also received a Secretary of the Navy Motor Vehicle Safety Award and Achievement in Industrial Safety.

In May, "Open House" was held on Armed Forces Day and Keyport's 40th birthday celebrated.

During this year the average value of materials in store:

Torpedoes and major components	$80,000,000
Torpedo Repair Parts	7,700,000
Other than above	450,000

Dollar value of purchases on the open market this year approximated $792,000.

Torpedoes Mark 16-6, 27-4, 28, 32-2 were being proofed.

1956

COMMANDING OFFICER CAPT JAMES A. PRICHARD

Average number of civilians - 962

military - 217

Nuclear-powered submarines were imparting a new emphasis on advanced underwater warfare and Keyport began building for this new future.

In July, the first of the new 72' torpedo retriever boats was received. The U.S.S. RAZORBACK on a visit to Keyport for ranging operations, sunk the old LST 17 off Neah Bay. The hull of the LST had been badly dented by inert torpedoes fired at her during the past year. Sinking of this ship provided realistic training for the RAZORBACK crew. All civilian employees at Keyport were given the opportunity for a guided tour of the above submarine after working hours. This was the first time the majority of civilian employees with years of experience in overhauling and proofing torpedoes had seen the inside of a submarine.

In April, the Thirteenth Naval District Navy Exchange opened a Branch Navy Exchange on the Station.

Also in April, the U.S. Marine Headquarters was transferred from Keyport to U.S. Naval Ammunition Depot, Bangor, leaving only a marine security guard of 1 officer and 30 enlisted men.

Construction of Building 206, the Quality Evaluation Laboratory, was begun. In July, a civilian director was hired and further staffing of the Laboratory was begun.

Contracts were let this year for:

NAVOL Loading and Passivating Facility

Repairs to the Freight Dock

Range Computer Building at Whitney Point

At this time the plant account value of the station was:

Land	$ 158,485
Buildings	7,249,565
Equipment	2,991,176

Average value of material in store:

Torpedoes and major components	$60,000,000
Torpedo Repair Parts	7,000,000
Other than above	425,000

Funding: Labor $4,500,000 Material $1,500,000

Value of purchases on the open market - $840,000

Average number of persons employed - Indirect 457

Direct 442

The Commanding Officer at Keyport was commended by the Chief of the Bureau of Ordnance for the handling of a touchy public relations problem on the occasion of an erratic running torpedo. The methods used were subsequently published in a Bureau of Ordnance Bulletin.

Payment of $100 was now being offered as a reward for the recovery of, or information leading to the recovery of, lost weapons and mines.

In May, a rupturing torpedo (under compressed air) took the

life of a civilian employee. No negligence was involved; however, it was determined that test equipment worn under constant use had failed.

The Head Conference Leader for Top Management Seminars at Rock Island, Illinois, visited the Station and addressed department heads and key personnel.

March - Station inspected by a team from the Department of Defense.

April - Station inspected by Management Evaluation Team.

The initial phases of Production Planning and Control went into effect in the Industrial Department and later MTM and Engineered Time Standards included.

COMMANDING OFFICER CAPT JAMES A. PRICHARD January - 31 December

Average number of civilians - 828

Consideration was being given again to the consolidation of the U. S. Naval Torpedo Station, Keyport, and U. S. Naval Ammunition Depot, Bangor. A target date of November was set; however, the action was subsequently cancelled following a visit of the Under Secretary of the Navy William B. Franke to this area.

The Quality Evaluation Laboratory building was completed and personnel moved into the building in May.

The Comptroller Department Head billet was changed from civilian to military.

In April, the Station's activities were the subject of an address given by the Commanding Officer to the National Defense Transportation Association in Seattle.

The Industrial Relations Department began issuing a bi-weekly bulletin entitled, "Industrial Relations Notes."

In July, the procedure of using boat sirens on the firing ranges commenced to warn persons on nearby beaches of torpedo firings. A 3-D Tracking Range was installed in Dabob Bay after extensive testing in Hood Canal. The installation was a joint effort by the Applied Physics Laboratory of the University of Washington and Keyport personnel. In rebuttal to several complaints of property owners in the vicinity of torpedo ranging operations the Commanding Officer

gave several presentations to civic groups emphasizing the point that "no injuries had been caused from erratic torpedoes since 1914".

New torpedoes being ranged were the Marks 43-3, 43-1 and 39-1.

Fund expenditures: Labor $4,500,000 Material $2,500,000

Average personnel working on Indirect 471

Direct 371

Average Value of Materials in Store:

Torpedoes and major components	$32,000,000
Torpedo Repair Parts	6,100,000
Other than above	425,000
Beneficial Suggestions submitted	154

1958

COMMANDING OFFICER — CAPT WILLIAM B. MOORE

EXECUTIVE OFFICER — CDR D. G. FLEMING

CDR R. L. COCHRANE

Average number of civilians - 772

officers - 17

enlisted - 150

The amount of work assigned to the Station of a research and development nature increased this year to the point where it seemed advisable to recommend a change in the wording of the Station's mission to include responsibilities in this field. Accordingly, in August a revised mission was recommended to the Bureau which contained certain research and development responsibilities.

In early January, a Bureau of Ordnance Management Evaluation Survey was conducted. A mark of OUTSTANDING was assigned for the initial presentation made by the Station.

Other statistics, events and highlights were as follows:

On 4 February, the first prototype ASTOR (later designated as the Torpedo Mark 45) was received at Keyport from Westinghouse for ranging.

In May the first torpedo ever to be recovered from 600 feet of water, a Mark 37, was recovered from the bottom of Dabob Bay by the use of the underwater television and hydraulic grappling gear on board the SONAR BELLE, a converted fishing boat owned by Jacobson

Bros. of Seattle. A service contract was entered into and numerous other sunken torpedoes were subsequently salvaged. By the use of the television camera it was conclusively observed that the reason for losing so many Mark 44's was the failure of the lead weight in the Mark 78 Mod 0 exercise head to be dropped consistently at the end of the run.

In May, Keyport was designated as the primary FIR (Functional Item Replacement) repair activity on the West Coast.

As an outgrowth of a suggestion by the Bureau (PLa), the YTT-6 (a large torpedo testing barge) was towed from Newport, Rhode Island, through the Panama Canal and arrived at the Station in June.

On 1 July the Quality Evaluation Laboratory, Naval Ammunition Depot, Bangor, closed its doors - another victim of the fast moving trend in naval ordnance from the gun and ammunition types to more sophisticated weapons. Twenty-one Bangor Laboratory employees transferred to the Laboratory at Keyport. These loyal Navy employees were a valuable asset to the Keyport group since many years of experience in specialized fields of quality evaluation were represented by their combined Navy service.

On 1 July, a civilian security guard force took over from the U.S. Marine Corps at the Bureau's direction. With the exception of a short period after World War II, the U.S. Marine Corps had served this Station's security needs for 40 years.

In August, a 5-year license agreement was signed with the Washington State Fisheries Department authorizing the use of the

Station lagoon as a site for nurturing salmon fingerlings for several months before releasing them to open water. The State did certain structural work at the lagoon outlet to make this possible. An initial planting of about 2,000,000 fingerlings was made. It is expected that when the released fish which survive reach the spawning stage they will attempt to get back into the lagoon.

In August, Mr. Louis M. Strom, the Master of the Public Works Department and an employee at Keyport for 43 years, retired. With permission of the Secretary of the Navy, the street by which the Station is entered was renamed "Strom Avenue" in his honor.

On 5 August, the Station received the first Torpedo Mark 44 for test.

Keyport, in conjunction with the Applied Physics Laboratory of the University of Washington, conducted a detailed survey of southern Alaskan waters in a YF to select a suitable deep water site to be used the following year for the test of a new low-frequency 3-D acoustic array designed by the Applied Physics Laboratory as a logical outgrowth of the high-frequency system used in Dabob Bay. The low-frequency system would have about three times the range of the original system. After review of much oceanographic and meteorological data gathered in the survey, the Applied Physics Laboratory determined that the portion of Chatham Strait near Waterfall Cove was the optimum location where waters 2000' deep exist close to shore.

A record run of 3,727,000 man-hours without a lost-time accident

was terminated in August when an employee received moderate injuries while taking a blanking plate off a mine exercise head.

The submarines, GRAYBACK and RAZORBACK, conducted ranging operations here for the Station. In December, the U.S.S. SARGO, the first SSN to work with Keyport, created quite a stir in local circles. Rides were arranged for groups of local citizens.

Complete renovation of the civilian cafeteria was begun. The interior was completed in 1958. As a result of a Station-wide contest, this now-modern facility was named The Potlatch Room (an Indian term meaning "a gathering of people and good food").

Evaluation of General Electric Mark 44-0 production torpedoes was begun in September. The company established an engineering field office at Keyport for the duration of this evaluation.

The first set of Torpedo Mark 37 Mod 0 workshop equipment to be produced here was ready for shipment to the Fleet in October.

The Bureau decided to assign the Bureau of Ordnance evaluation of Torpedo Mark 45 to Keyport, the first such important assignment given to the Station. Actual firings began in November.

In November, the developmental torpedo known as RETORC II was tested in Dabob Bay under the direction of the Ordnance Research Laboratory, Penn State University.

During the fiscal year 1958, Station expenditures were as follows:

Labor	$4,300,000
Material & expenses other than labor	2,200,000
	$6,500.000

1959

COMMANDING OFFICER — CAPT WILLIAM B. MOORE, USN

EXECUTIVE OFFICER — CDR D. G. FLEMING, USN

Average Number of civilians - 783

officers - 18

enlisted - 160

In January the Secretary of the Navy issued a revised mission which read as follows:

> "To proof, test, evaluate, manufacture and issue underwater weapons and components. Provide research and development services to Naval and commercial activities as directed by the Bureau of Ordnance. Exercise design cognizance of underwater acoustic ranges and of range equipment."

The most memorable and unique operation of the year was the joint Keyport-Applied Physics Laboratory, University of Washington expedition to Chatham Strait, Alaska, for the planting and testing of a single low-frequency array in 2000' of water near Waterfall cove.

The YF-885 was transferred to this command from NAD Bangor; in addition to its torpedo firing role, it was modified to accomodate underwater TV and torpedo recovery equipment (SOLARIS). A computer was assembled and installed by the Applied Physics Laboratory on board the YF-885. This ship, along with the firing ship YF-451 and a 72' torpedo retriever, departed 6 July carrying the disassembled array with LCDR Glen A. Savage in charge. After a stop

at Ketchikan, the expedition reached Waterfall Cove and then began assembly of the cumbersome and delicate hydrophone array (30' on a side) on the cramped deck space. It was successfully planted by free fall close to the pre-selected spot and coaxial cable led back to the YF-885 anchored in Waterfall Cove. Nine torpedoes were fired from YF-451 and tracked with highly gratifying reliability and accuracy. Applied Physics Laboratory personnel under the direction of Dr. David S. Potter operated the computer and controlled the tests. The array was recovered successfully. After a short recreational visit to Juneau and the Red Dog Saloon, the craft returned safely to the Keyport Dock on 11 August amidst music, fire hoses aspray, and general family jubilation. The BOQ's portable bar was set up on the spot for this gladsome occasion. Another highlight of this expedition was the catching of a 140-lb. halibut from the stern of the YF-451 by CWO W. Cox the first night in Waterfall Cove.

APPENDIX

Because of the erratic performance of certain torpedoes being issued to the Fleet in 1943, the Applied Physics Laboratory of the University of Washington was commissioned by the Bureau to design a more reliable influence exploder for these weapons. Since successful completion of that task the Laboratory has devoted its energies to the development of underwater weapons, components and systems, and particularly acoustic tracking instrumentation.

In 1952 the Laboratory recommended to the Bureau that they be requested to study the feasibility of designing and constructing a 3-Dimensional high-frequency tracking range (3-D Range) capable of simultaneously and accurately tracking two high speed moving objects such as a torpedo and its target. By 1955 the basic design and development and construction of the necessary components had been completed.

In September 1956 the Computer Building at Whitney Point was completed. In the summer of 1958 it was considerably enlarged to accomodate the Ordnance Research Laboratory sound measuring gear and other needs.

In 1957 after extensive testing in Hood Canal the first increments of the present range were installed in Dabob Bay as a joint effort by personnel of the Applied Physics Laboratory and the Naval Torpedo Station Keyport. During the summer of 1958, by mutual agreement, Keyport gradually took over the Applied Physics Laboratory's responsibility for the range and in early 1959 Keyport had assumed

full responsibility for its operation and maintenance.

The site in Dabob Bay was selected for its favorable oceanographic features such as the 600' water depth, soft mud bottom, bottom lip across the mouth of the Bay and other favorable characteristics.

The 3-D Range has exceeded the initial design goals. It locates a torpedo, submarine or other vehicle properly instrumented every 2/3 of a second with a point-to-point accuracy of ± ½ foot and in true space with an accuracy of ± 5 feet. Today the range is completely operational and its capabilities are continuously being increased. It provides an accurate and instantaneous presentation of movements of an underwater missile, a submerged submarine or a surface vessel. Since it is capable of tracking two objects on a shared-time basis it can be used to track an underwater missile and its target, either moving or stationary. From the 3-D computer data accurate determinations of the parameters of the trajectories of missiles and submarines may be made. This information is invaluable from the standpoints of design and tactical considerations.

The 3-D Range has many possible and practical applications for which other measurement systems are able to deal either ineffectively or not at all and the number of applications is growing constantly. It is an extremely valuable tool in the development, testing and improvement of all underwater systems. In the develop-

ment of these systems it can be used to determine such parameters as velocities, accelerations, turning radii, reach, transfer, advance, dive-climb angles for submerged missiles and submarines. It can determine these parameters with accuracy and at depths never before obtained. Other feasible applications are tracking the underwater trajectory of missiles with an air phase, calibration of electromagnetic pitometer logs at great depth and at any speeds; determining the effectiveness of counter-measures against torpedoes and determining transients in missile or torpedo control systems. The accuracy of sonar ranges and bearing has also been checked with alarming results in the case of a 13th Naval District destroyer escort.

The range represents the ability to check a complete anti-submarine warfare system whether it involves ships vs. submarines, submarines vs. submarines, or some other combination including the missile that is fired at a submarine. It can be used to check out the system from early development stage through testing and production stages, providing information at each stage that has not been previously available from any source.

In the past the loss of a torpedo in deep water was permanent. Frequently the information recoverable from the torpedo concerning the cause for its malfunction is more valuable than the unit itself. If the sunken torpedo is within the array area, through the use of the 3-D range, a combined recovery and TV camera apparatus can

be guided by 3-D tracking to locate and recover the unit. This has been done repeatedly.

The increase in effectiveness of underwater weapons systems which can result from the optimum use of this range makes it one of the Bureau's most valuable facilities.

During the period 1 January 1958 - 1 January 1960 the Dabob Bay 3-Dimensional Range was expanded from three arrays to a total of ten. In addition four noise measuring hydrophones were planted in the array area for use with the Ordnance Research Laboratory of Penn State gear in the Computer Building at Whitney Point.

Major improvements in the range facilities included procurement and installation of Raydist navigating equipment on the YFRT's, enlargement of the Computer Building, construction of a preamp house, installation of equipment such as an IBM 523 Summary Punch, a Variplotter, an improved 330 KC acoustic transmitter, a new calibrator to allow synchronous clock operation and replacement of many developmental prototype computer, switching and control panels. Also during this period transistorized transponders and synchronous clocks were developed and introduced by the Applied Physics Laboratory.

The floating pier in front of the Shellfish Laboratory was designed, assembled and installed in April, 1959.

Approximately 879 torpedo runs were made over the range from 1 January 1958 to 1 January 1960.

In January, proof of torpedoes Mark 37 Mod 0 produced at Naval Ordnance Plant Forest Park commenced. Also, the Station turned out its first complete torpedo exercise head.

March brought the first Fleet Ballistic Missile (POLARIS) work to Keyport when the Quality Evaluation Laboratory started missile component reliability test for Lockheed Missile and Space Division of Sunnyvale, California. Work in this field was subsequently accomplished by direct assignments from the Special Projects Office, Washington, D.C.

In April, the YTT-6, after extensive outfitting, was towed to Dabob Bay and moored off Bolton Peninsula for use primarily in the ASTOR evaluation program. This barge was equipped with an underwater firing tube and the prototype Angle Solver Mark 18.

A contract was entered into with Vitro Corporation of Silver Springs, Maryland to design and make a sophisticated mobile underwater television and torpedo recovery apparatus to be controlled from a YF-885 according to general requirements established by Keyport. This gear, designated SOLARIS (Submerged Object Locating and Recovery/ Identification System), was delivered in April 1960 at a cost of approximately $145,000.

In July the Industrial Department established the Data Analysis Center in Building 82 after suitable preparation of the formerly unused space.

A panel of fiscal experts from the Bureau and NAVCOMPT spent many days at Keyport assisting the Station in getting ready for the Naval Industrial Fund (NIF) system of accounting which went into effect at midnight 31 December. The charter of the Station, officially presented to the commanding officer the first part of January by the Deputy Comptroller of the Bureau of Naval Weapons, established a cash allocation of $3,100,000.

In the early part of the year, the Bureau authorized an increase in civilian ceiling to 805 based on urgent requests from the Station. However, the Bureau found it necessary in allocation of Fiscal Year 1959 funds to severely curtail those to be used for torpedo proofing. Proofing of the Mark 16-6 was particularly affected. This cutback had a direct effect on the Station's manning level so that it became regrettably necessary to impose a Reduction-in-Force. This was originally set at 32 people but due to normal attrition, and reassignments, the final number involuntarily separated by 1 November was only 21. This was the first Reduction-in-Force since November 1957.

In October 1959 after extensive preliminary planning an evaluation of a British designed electronic acoustic torpedo decoy was conducted. HMCS NEW WATERFORD towed the decoy against which 150 runs of various marks of torpedoes were fired. The United Kingdom, Canada, Chief of Naval Operations, Bureau of Ships, Bureau of Ordnance and several

associated laboratories were all jointly involved in this interesting program and had representatives present during most of the period. The results were interesting too. A voluminous classified report was submitted by Keyport late in December.

As of 1 December, the Naval Torpedo Station with other ordnance activities were placed under the management control of THE BUREAU OF NAVAL WEAPONS (Assistant Chief for Fleet Readiness).

Numerous distinguished visitors came to Keyport and/or Dabob Bay during the year among whom were -

Senator Henry M. Jackson (Washington)

Congressman Phil Weaver (Nebraska)

Congressman T. C. Tollefsen (Washington)

Admiral James S. Russell (VCNO)

Rear Admiral P. D. Stroop (Chief (BuOrd) Naval Weapons)

Rear Admiral M. H. Hubbard (Deputy Chief BuOrd)

Vice Admiral H. G. Rickover (with Senator Jackson)

Vice Admiral E. W. Clexton (Chief ONM)

Rear Admiral J. W. Boundy (Chief BuSandA)

Rear Admiral J. W. Ailes (Inspector General)

Foreign officers and some civilians from England, Canada, France, West Germany and Holland visited Dabob Bay from time to time, sponsored by the Bureau. Our unique technical facility in this beautiful setting has now been widely publicized and is a source of great

pride at this command and at the Applied Physics Laboratory, University of Washington.

The exterior of The Potlatch Room was completed, and during December the dining room and lounge of the BOQ were given a much needed refurbishing. The rejuvenated setting was "christened" by a luncheon on 24 December attended by all officers and many Station civilians at which the center of attraction was a 75-lb. pig donated by the Supply Officer LCDR C. B. Aycock, barbecued on a spit in the big fireplace. It is hoped this will become a Station custom.

During Fiscal Year 1959 station expenditures were as follows:

For labor	$4,500,000
For material and expenses other than labor	2,800,000
	$7,300,000

1960

COMMANDING OFFICER	CAPTAIN W. B. MOORE	1 January - 30 June
	CAPTAIN W. T. GRONER	30 June - 31 December

Average number of civilians - 783

military - 178

Expanded testing programs for underwater weapons, evaluation of anti-submarine warfare systems and increased capability to measure combat readiness of Fleet ships contributed to a busy year. Two new hydrophone arrays for 3-dimensional tracking were installed in Dabob Bay increasing the total to 12; in addition, modifications were completed on the Whitney Point computer installation to improve its efficiency. Proofing of Torpedoes Mark 44 Mod 0, Mark 37 Mod 0, Mark 16 Mod 6, Mark 37 Mod 1, and Mark 44 Mod 1 was supplemented by the firing of prototype Torpedo Mark 46 Mod 0 and testing of Sandia Corporation Missiles.

Many ship and submarine fire control systems were checked for accuracy by employing the unique capabilities of the 3-dimensional tracking range. Destroyers - American, British, and Canadian, participated in torpedo counter measures evaluation. Sonar bearing, radar and gyro accuracy tests, tactical data measurements, standardization trials, torpedo tube acceptance trials, and underwater weapon firings were conducted on various nuclear and conventional submarines and surface units. A total of 2400 underwater weapons were ranged during the year.

Technical evaluation of Torpedo Mark 45 Mod 0 (ASTOR) prior to release for production was completed this year. A 72' torpedo retriever was received increasing the Station's complement to four of this class. In January, Keyport divers successfully completed a hazardous salvage operation to recover a Navy A3D Bomber in 150' of water near Whidbey Island.

Keyport was designated responsibility to repair the West Coast Torpedo Functional Item Replacement (FIR) activity with assigned responsibility to repair the "black box" modules returned from the fleet.

Construction:

Renovations to Plating Plant, Building 72

Renovations to Commissary (General Mess)

Installation of a new flagpole

Expansion of Range Equipment Laboratory, Building 185

Installation of truck scales - Supply Department

Construction and installation of optical tracking facilities for Sandia Corporation at Whitney Point

Installation of a Functional Item Replacement (FIR) facility in Building 98

Renovations were made to a portion of the interior of the main gate house to establish St. Olaf's Chapel.

Miscellaneous Highlights:

January - The Station converted its Modified Industrial Accounting to Industrial Commercial Type Accounting System with an initial cash allocation of $3,100,000.

January - Keyport was assigned the responsibility for Wage and Classification Services for NAD Bangor and POMFPAC. Accounting and data processing support functions were added concurrently. In July, Supply functions of Bangor were transferred to Keyport; a commensurate increase in purchase authority to $10,000 was authorized.

During this year Keyport was cited for achieving a first place in savings bond sales among BuWeps activities and second in the nation among all Naval activities employing more than 500.

The Station reached a total of 1,061,527 man-hours without a lost time accident.

A total of $7,300,000 was expended in support of the Station mission.

1961

COMMANDING OFFICER	CAPTAIN W. T. GRONER	1 January - 30 June
	COMMANDER H. G. GARNETT	1 July - 11 July
	CAPTAIN H. C. MAYNARD	12 July - 30 December

Average number of civilians - 851

military - 184

In August and September, the Patos Island 3-D range was commissioned and placed in operation. It was located in the Straits of Georgia adjacent to the Canadian Border. A new computer van, array, and support equipment were transported by barge to the range; installation and successful tracking of weapons followed in quick succession. Simultaneously, a joint U.S.-Canadian range at Ballenas Island was planned.

Torpedo projects in active status were: Mark 44 Mod 0, Mod 1, Mod 2, Mod 3, Mod 4; Mark 46 Mod 0; Mark 37 Mod 0, Mod 1; RETORC; DERI; DAPHNE; PORPOISE; and HIDENT. A total of 1950 weapons were in-water ranged this year.

The rate of ASW accuracy measurements was accelerated to three ships per month.

$9,300,000 was expended in support of the Station mission.

An IBM computer was installed in the Data Processing Division, Comptroller Department, and a scientific computer was requested for on-line processing of 3-D data.

During this year, 452 Functional Item Replacements were repaired.

In May, the Honorable John B. Connelly, Secretary of the Navy, toured the Station and its facilities.

1962

COMMANDING OFFICER CAPTAIN H. C. MAYNARD 1 January - 30 December

Average number of civilians - 958

military - 205

In July, the Station was cited by the Chief of the Bureau of Naval Weapons for outstanding contributions to various torpedo production programs. Savings in excess of $1,800,000 for improved production methods were specifically cited. A major portion of the savings resulted from reduced unit cost achieved in the manufacture of Exercise Head Mark 78 Mod 0.

A certificate of commendation for the employment of physically handicapped was also received.

Another award received was a special Savings Bond Minute Man Flag from the Secretary of the Treasury. This marked the Station's 13th consecutive year of over 90% employee participation in the purchase of bonds. The General Mess received the Ney Award for the best small mess in the 13th Naval District. This annual award is presented for the highest standards of general mess, habitability, management, food preparation, sanitation and service.

In a special ceremony, "C" Street was renamed "Bushnell Drive" in honor of Captain Carl H. Bushnell, USN, former Commanding Officer.

$13,000,000 was expended in support of the Station mission. A Control Data Corporation Model 160-A computer for scientific computations was received and installed in Data Processing.

In November the Command distributed an employee questionnaire consisting of approximately 200 questions. It was issued to solicit each employee's opinions regarding his job, supervision, morale; to encourage suggestions how to improve the ability of the Station to perform its mission efficiently and economically, and to provide guidelines for solving problem areas. The Business Research Division, University of Washington, assisted in the formulation of questions, administering the questionnaire and evaluation of results.

A study was conducted to microfilm engineering drawings. A storage and retrieval system for microfilm mounted on EAM aperture cards was established.

A total of 2056 Functional Item Replacements were repaired during the year.

Construction began in April for a computer van site at Zelatched Point, Toandos Peninsula, to control the South Dabob Bay firing range; accessory navigation aids and warning beacons were installed.

The following improvements were made to shop working areas:

Building 38 annex was converted from a torpedo storage area to a welding and machining shop for exercise head and warhead fabrication.

The Functional Item Replacement shop was expanded to include a "white room" in Building 98.

The Acoustic Test Facility was rebuilt.

A mine Mechanism Overhaul Shop was established.

Construction of heliport at the Whitney Point computer site, Dabob Bay was commenced.

Electrical Assembly Shops were expanded and modernized.

Building 37 was renovated and remodeled to improve Supply Department traffic functions. A loading ramp was constructed to permit loading or unloading of three vehicles simultaneously. The Traffic Branch of the Supply Department was subsequently transferred to these renovated facilities.

1963

COMMANDING OFFICER	CAPTAIN H. C. MAYNARD	1 January - 19 June
	COMMANDER W. F. GADBERRY	20 June - 27 June
	CAPTAIN W. H. WRIGHT	28 June - 30 December

Average number of civilians - 987

military - 212

In January, Keyport and NAD Bangor Public Works Departments were consolidated and headquarters moved to NAD Bangor. One hundred thirty-nine Keyport workers were transferred to the new quarters. Production functions such as welding, painting, carpentry, sheetmetal, etc. were transferred to the Industrial Department at Keyport.

In May, Rear Admiral K. S. Masterson, Chief of the Bureau of Naval Weapons, visited the Station.

Major areas of torpedo work were Marks 37-0, 37-1, 44-1, 45-0, 45-1, and 46-1. 4300 underwater weapons were proofed.

Ranging and support services were provided to the following contractors and activities: Aerojet General Corporation, General Electric Company, Sandia Corporation, American Machine and Foundry Company, Naval Underwater Ordnance Station, Applied Physics Laboratory, University of Washington, Vitro Laboratories, Clevite, Naval Research Laboratory, Naval Mine Defense Laboratory, Ling-Temco Vought Company, The Canadian Navy, Naval Ordnance Unit, Naval Weapons Training Device Center, Ordnance Research Laboratory, Naval Ordnance Test Center, and David Taylor Model Basin.

Improvements continued at the 3-dimensional Dabob Bay tracking ranges at Whitney Point and Zelatched Point. Askania and M-45 tracking cameras were installed. On-line computer operations with the 3-D range were achieved. Sample proofing began in August on the Torpedo Mark 44 Mod 1.

Audio-visual presentations as an aid for component production or torpedo maintnenance/overhaul were created at Keyport starting in January. Personnel from Industrial Management and Industrial Departments were trained to install and maintain this system. Application of this technique was investigated for shore stations and Fleet units. As a result of favorable Fleet evaluations, use by training schools and tenders planned to continue and expand these programs.

$14,700,000 was expended in support of the Station mission.

4,999 Functional Item Replacements were repaired during this year.

1964

COMMANDING OFFICER CAPTAIN W. H. WRIGHT 1 January - 30 December

Average number of civilians - 1206

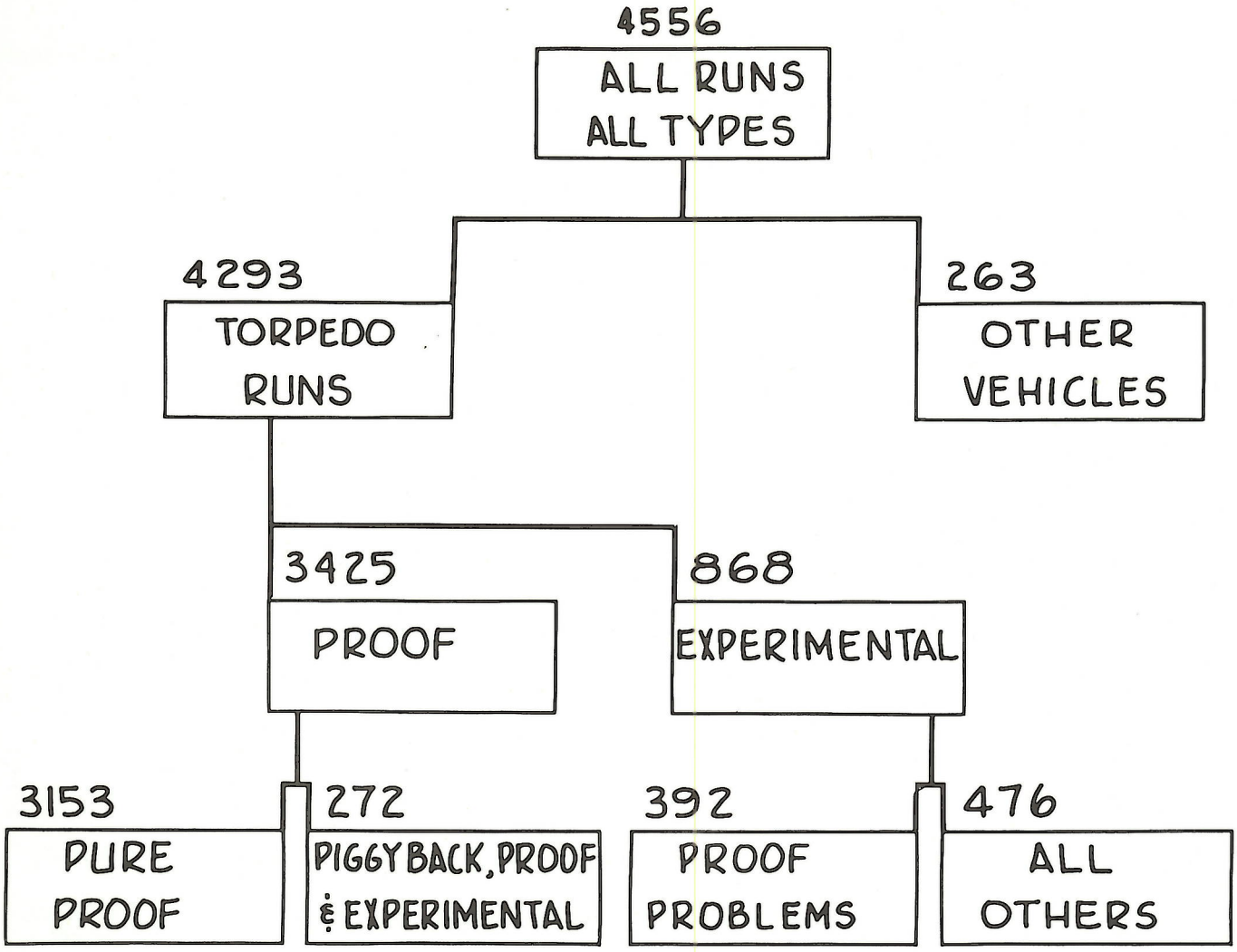
military - 249

In November, the Station celebrated its 50th Anniversary of continuous operation since commissioning in 1914.

For the 11th time Keyport won recognition by the Secretary of the Navy for its safety record, and for the third consecutive year Keyport received an Office of Industrial Relations award by qualifying for the Navy Suggestion Honor Roll. The General Mess again won Navy-wide recognition as first runner-up for the Ney Award for outstanding food service. Keyport received three gold stars on the Minute Man Savings Bond Flag for maintaining over 90% participation for 15 years. Ranging and proofing of weapons continued with 4,556 range runs of all types, 4,293 on torpedoes.

A reorganization was effected, establishing the Technical Operations Office under which all technical phases of Station operations were conducted.

RANGE RUNS - 1964



$$\frac{\text{ALL EXPERIMENTAL}}{\text{ALL RANGE RUNS}} = \frac{1131}{4556} = 25\%$$

$$\frac{\text{TORPEDO EXPERIMENTAL}}{\text{ALL TORPEDO RUNS}} = \frac{868}{4293} = 20\%$$

1964 RANGING

TORPEDO

MARK-MOD	RUNS	
14-5	86	
16-6	1	
37-0	105	
37-1	1368	
43-1	8	
44-1(A)	1337	
44-1(N)	993	
45-0	17	
45-1	216	
46-0	118	
46-1	1	
44-(ITALIAN)	43	
TOTAL TORPEDO RANGING		4293

SPECIAL VEHICLES

RETORC	13	
HI POINT	40	
HI SPEED 37	7	
SHIP RUNS	75	
OTHER	49	
MAINTENANCE	79	
TOTAL SPECIAL VEHICLES RANGING		263
TOTAL RANGING		4556

1965

COMMANDING OFFICER CAPTAIN W. H. WRIGHT 1 January - 30 December

Average number of civilians - 1304

military - 277

Keyport initiated the Weapons System Accuracy Trial Program, which tests both ship and weapon simultaneously. These tests were made successfully on numerous ships during the year.

4370 total Range Runs were made - 3905 on torpedoes. Marks 16-8, 44-1, 45-1, and 37-0 were the major weapons. The first Torpedo Mark 46-0 production units arrived for proofing, also several Torpedo Mark 46-1's were received for pre-operational evaluation. During this period the active phase of Torpedo Mark 48 and Mobile Target Mark 27 Mod 0 developmental program began. The first two launchings of the Torpedo Mark 48 were in December.

Visitors during the year were Vice Admiral C. B. Martell, Director of the Navy's ASW Programs; Rear Admiral A. M. Shinn, Chief, Bureau of Naval Weapons; Congressman F. B. Hicks; Admiral D. L. McDonald, Chief of Naval Operations; Commodore Winnett, RCN; Commodore R. M. Battles, RCN; and Rear Admiral J. W. Davis from Chief of Naval Operations Office, Torpedo Orientation. The following allied representatives received training under the Military Assistance Program: Republic of German Navy - Mark 37, Republic of Korean Navy - Mark 44, and South African Navy.

In April, a SERVMART was installed in the Supply Department for ready issue of minor support supplies on a self-service basis.

A Consolidated Industrial Relations Office was established 1 January to service Keyport, NAD Bangor, and POMFPAC.

Awards received this year were: Chief of Information Merit Award for publishing an exemplary newspaper; Secretary of the Navy Award for Achievement in Safety, the twelfth consecutive citation; the Ney Award for the best small mess in the Thirteenth Naval District.

Seven thousand Functional Item Replacements were processed during this year.

Procedures were formulated for the mechanization of bills of material program. Stock records for this area were mechanized, as was a status reporting system.

A project was commenced to microfilm job orders and bills of material for Production, Planning and Control.

Ranging and support services were provided by the Station to Naval Research Laboratory, Washington, D.C; Ordnance Research Laboratory - University of Pennsylvania; Applied Physics Laboratory - University of Washington; Aerospace Division - Goodyear Corporation; Sandia Corporation; Naval Ordnance Plant, Forest Park, Illinois; Naval Ordnance Test Station, Pasadena, California; Naval Ordnance Laboratory, White Oak, Maryland; David Taylor Model Basin, Washington, D.C. and others. The Zelatched Point permanent computer facility

for the South Dabob Bay 3-D Range became operational.

$20,400,000 was expended in support of the Station mission.

A new 72' boat (CR12) was received in March and later modified for use as a target and noise measuring craft.

Keyport was represented by a Master Chief Torpedoman (Diver) as an aquanaut in the Navy Sealab II program in Long Beach, California, under the leadership of Astronaut M. Scott Carpenter.

Westinghouse Corporation constructed Building 478 at a cost of $500,000 to house the Torpedo Mark 48 program. It is intended that the building will eventually be turned over to the Government.

The scope of Videosonic programs steadily expanded to include Torpedoes Mark 37, Mark 44, and Mark 46.

As of 30 December the Station's civilian employee ceiling was 1392 - the highest since World War II.

1966

COMMANDING OFFICER	CAPT W. H. WRIGHT	1 Jan - 1 May
	CDR W. E. SMITH	1 May - 28 July
	CAPT J. L. HUNNICUTT	28 July - 31 December

Average number of civilians - 1400

military - 247

Keyport was the center of activity for the Torpedo Mark 48 evaluation efforts by Westinghouse and Sundstrand Corporations. Over 100 experimental runs were conducted at the Dabob Bay and Nanoose Ranges.

The programs for the Torpedoes Mark 46-0 and Mark 46-1 received most of the emphasis at Keyport during 1966. Production proofing and operation evaluation runs were completed on over 900 units received from Aerojet, Minneapolis Honeywell, Naval Ordnance Test Station (NOTS), and Naval Ordnance Production Facility (NOPF), Forest Park.

There were over 3000 runs completed on NTS ranges during the year and these included Torpedoes Mark 14-5, 16-8, 37-0, 37-1, 37-2, 44-1, 45-1 and the Target Mark 27 in addition to the Torpedoes Mark 46 and Mark 48. This effort is depicted in the charts which follow.

Ranging and technical support was provided for experimental units or vehicles for the following sponsors: The University of Washington's Applied Physics Laboratory (APL) programs - (a) Towed

Underwater Fleet Training Device (TUFTD), (b) Torpedo Electro Magnetic Exploder (TEME), (c) Passive Homing Anti-Shipping Torpedo (PHAST), (d) and Azimuthal Tracking Electronic Configuration (AZTEC); the Naval Ordnance Laboratory (NOL), White Oak, Maryland - Mobile Mine Research Acoustic Vehicle (RAV); the David Taylor Model Basin (DATMOBAS) Boeing-built Hydrofoil PCH-1; Special Tests for the Sandia Corporation and the Minneapolis-Honeywell Corporation's Suspended Training Unit (STU).

Weapon System Accuracy Trials (WSAT) were conducted on seventeen submarines during the year. Capability was acquired during the year for extension of WSAT to include surface ships.

Functional Item Replacement (FIR) activity increased during the year to a total of 4695 units repaired. FIR capability in support of the Torpedo Mark 46 was also acquired during the year.

Visitors during the year included Mr. James K. Nunan, Defense Research and Engineering; Captain Satterford, Commander of Submarine Flotilla One; the Honorable Graeme C. Bannerman, Assistant Secretary of Navy; Astronaut Richard Gordon; Senator Henry Jackson; Congressman Floyd Hicks, and Admiral Gralla, Commander, Naval Ordnance Systems Command Headquarters.

The Quality Evaluation Laboratory performed evaluations on 296 Torpedoes Mark 37, Mark 44 and Mark 45 and over 100 batteries under the surveillance program. Pre-and periodic production tests

were conducted on over 2300 sub-assemblies of the Torpedo Mark 46 and over 700 torpedo batteries and 392 wire dispensers. Increased effort was also noticeable in support of component evaluation of the POLARIS Missile and in calibration operations.

Torpedo proofing procedures were revised by the Math Sciences and Proof Divisions. This resulted in a new procedure, WR-64, being issued which includes new concepts and techniques in torpedo proofing.

A FIR-MART, similar to the SERVMART concept, was established in the FIR Repair Shop. Issues are made by prepunched EAM cards negating the use of the DD Form 1150.

NTS divers assisted in the recovery of an Air Force plane off Jefferson Point piloted by General I. L. Branch who perished in the craft.

During the year the following craft were acquired: two 72-foot torpedo retrievers, one 73-foot target boat and one 36-foot motor launch.

Facilities planning during the year included final plans and specifications for the new 60,000 SF torpedo shop (MCON P-009), facility studies for an addition to the QE Lab (MCON P-008) and for an addition to the Keyport-Bangor Pier (MCON P-005). The following special projects for minor construction and equipment installation were prepared for NOSC approval: Shock & Vibration Test Facility (Building 24); Covered Pallet Rack Storage System (Building 37);

Industrial X-ray Facility (Building 38); and a Gage Laboratory (Building 105).

New construction included an addition to Building 24 for battery testing; decking over a cranewell in Building 82 for a noise measurement facility; alteration to Building 478 for a Torpedo Mark 46 shop; repairs to Piers 1 & 2 and rehabilitation of the Barracks, Building 35.

NTS monthly publication, "Keynotes," was the recipient of two "orchids" for editorial excellence awarded by the Pacific Northwest Industrial Editors Association.

Videosonic effort in support of the Torpedo Mark 46 was accelerated to include turnaround maintenance programs on both the Mod 0 and Mod 1. Distribution of the Torpedo Mark 44 program material continued and included the South African, Korean, and Norwegian Navies.

The Submerged Object Recovery Device (SORD) was used for retrieving torpedoes in waters 3000 feet deep off the Virgin Islands. Keyport received a letter of commendation from Rear Admiral C. A. Karaberis (ASW) for this successful effort.

The Bremerton Chamber of Commerce awarded Keyport first place for its Armed Forces Day window display.

The IBM 1401 and CDC 160-A computers were replaced with IBM 360/30 and CDC 160-G systems. These systems were housed in a new facility that provides constant environmental conditions.

The civilian ceiling increased to 1569 on 31 December, which is the highest figure since 1945.

1966 — RANGING

TORPEDOES

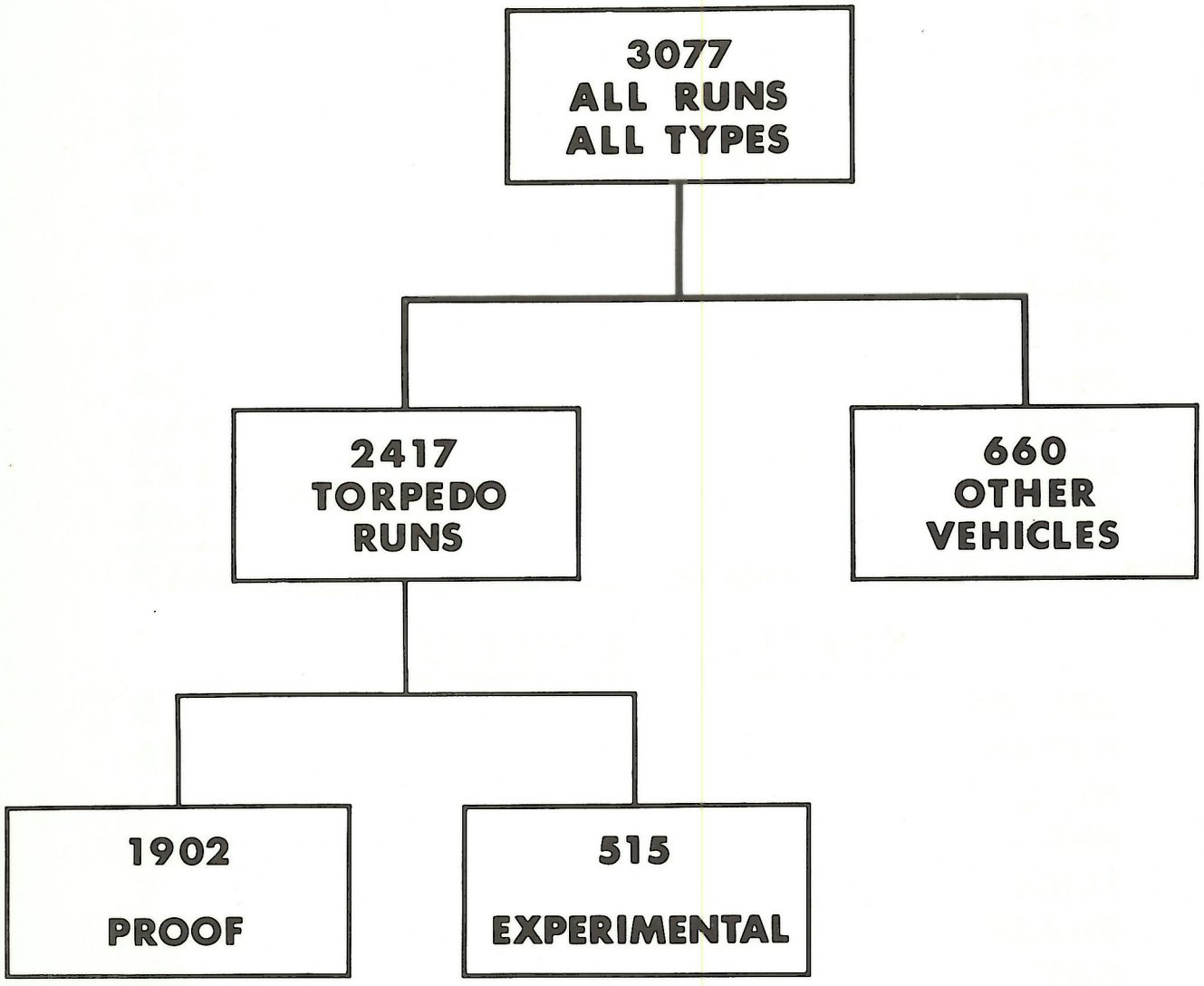
MARK & MOD	RUNS
14-5	48
16-8	82
27-0	80
37-0	317
37-1	279
37-2	57
44-1	282
45-0	3
45-1	230
46-0	728
46-1	192
48-0	109
TOTAL TORPEDO RANGING	2417

SPECIAL VEHICLES

APL-45	5
AZTEC	36
PR-2	41
PRO-3	36
TEME	9
PHAST	29
RAV	31
TUFT	16
BOUYANT UNIT	9
RANGE MAINTENANCE	42
SHIP RUNS	401
MISCELLANEOUS	6
TOTAL SPECIAL VEHICLE RANGING	660

TOTAL RANGING 3077

RANGE RUNS - 1966



$$\frac{\text{ALL EXPERIMENTAL}}{\text{ALL RANGE RUNS}} = \frac{1175}{3077} = 38\,\%$$

$$\frac{\text{TORPEDO EXPERIMENTAL}}{\text{ALL TORPEDO RUNS}} = \frac{515}{2417} = 21\,\%$$

COMMANDING OFFICER CAPT J. L. HUNNICUTT 1 JAN - 31 DEC

Average number of civilians - 1600
military - 225

The Nanoose Range was expanded from three arrays to a total of ten arrays for an overall length of about 28,000 yards. On 17 December, lightning struck Winchelsea Island and caused severe damage to the underwater tracking equipment.

For the first time, helicopters were used to ferry torpedoes between Keyport and Nanoose Test Range in British Columbia.

During February, the services of PISCES, a two-man submersible, was obtained from International Hydrodynamics; and in August, equipped with a suitable claw, torpedo recovery operations commenced. PISCES recovered four torpedoes in one day between the hours of 1600 and 2400 indicating considerable advantage in terms of recovery cost, time, and flexibility.

Weapon Systems Accuracy Trials on surface vessels was inaugurated with the USS FOX. The preliminary ranging for surface WSAT was accomplished in Dabob Bay with the final weapon firing occurring at Nanoose. The first ASROC firing occurred in March from the USS JOUETT.

New programs added to the Naval Torpedo Station included the Mobile ASW Target Mark 30 and the Clevite Torpedo Mark 48 Mod 1. Also inaugurated was the Quality Assurance Systems Test (QAST) program, which is a performance evaluation of on-the-shelf stock piled weapons.

The Torpedo Mark 46 program represents the largest level of effort at Keyport and has required hard work and cooperation by hundreds of Keyport employees. During 1967, several significant milestones were achieved in the Torpedo Mark 46 program operations at Keyport. Proofing of all Mark 46 Mod 0 torpedoes was essentially completed. The first deliveries of Mark 46 Mod 1 torpedoes were initiated in 1967, and after completion of the primary qualifications, Phase II proofing was commenced.

Sample proofing of Torpedo Mark 44 Mod 1 was completed at the end of the year. Evaluation and proofing of Torpedoes Mark 37 Mods 2 and 3 commenced, proofing of Torpedo Mark 45 continued, and proofing of Torpedo Mark 16 Mod 8 was completed.

Torpedo Mark 48 Mod 0 development tests continued at the rate of one shot per week. The contractor (Westinghouse) will start production prototype tests in the future.

The Clevite Corporation Torpedo Mark 48 Mod 1 development tests started in September. The first phase of the Mark 48 Mod 1 development test program was successfully completed in December, and the second phase of evaluating the acoustic system and propulsion vehicle began in December.

Visitors during the year included: Capt J. P. Stevenson and LCDR P. V. Blackman, Australian Navy; Commodore R. O. Henning, Royal Canadian Navy; Vice Admiral Ignatius J. Galantin, Chief of Naval Material; Mr. Van Batenberg and Mr. Van Morle, Netherlands; Dr. Grewe and Mr. H. Wollman, Germany; LT Wu, China; and Capt J. L. Carter.

Major construction at Keyport included: the development of an industrial X-ray facility in Building 38, the start of construction for a 25-foot radius centrifuge facility capable of carrying loads to 1000 pounds to an acceleration of 50 g's, and the construction of a hazardous vibration and shock test facility. The most significant construction since World War II was initiated and nearly completed for a new 60,000 square foot torpedo shop and FIR (Functional Item Replacement) facility. This building includes new equipment to test the state-of-the-art weapons now at Keyport.

The Naval Torpedo Station received the Naval Supply Systems Command Small Business Program Performance commendation for awarding 59% of the value of all contracts to Small Business in Fiscal Year 1967.

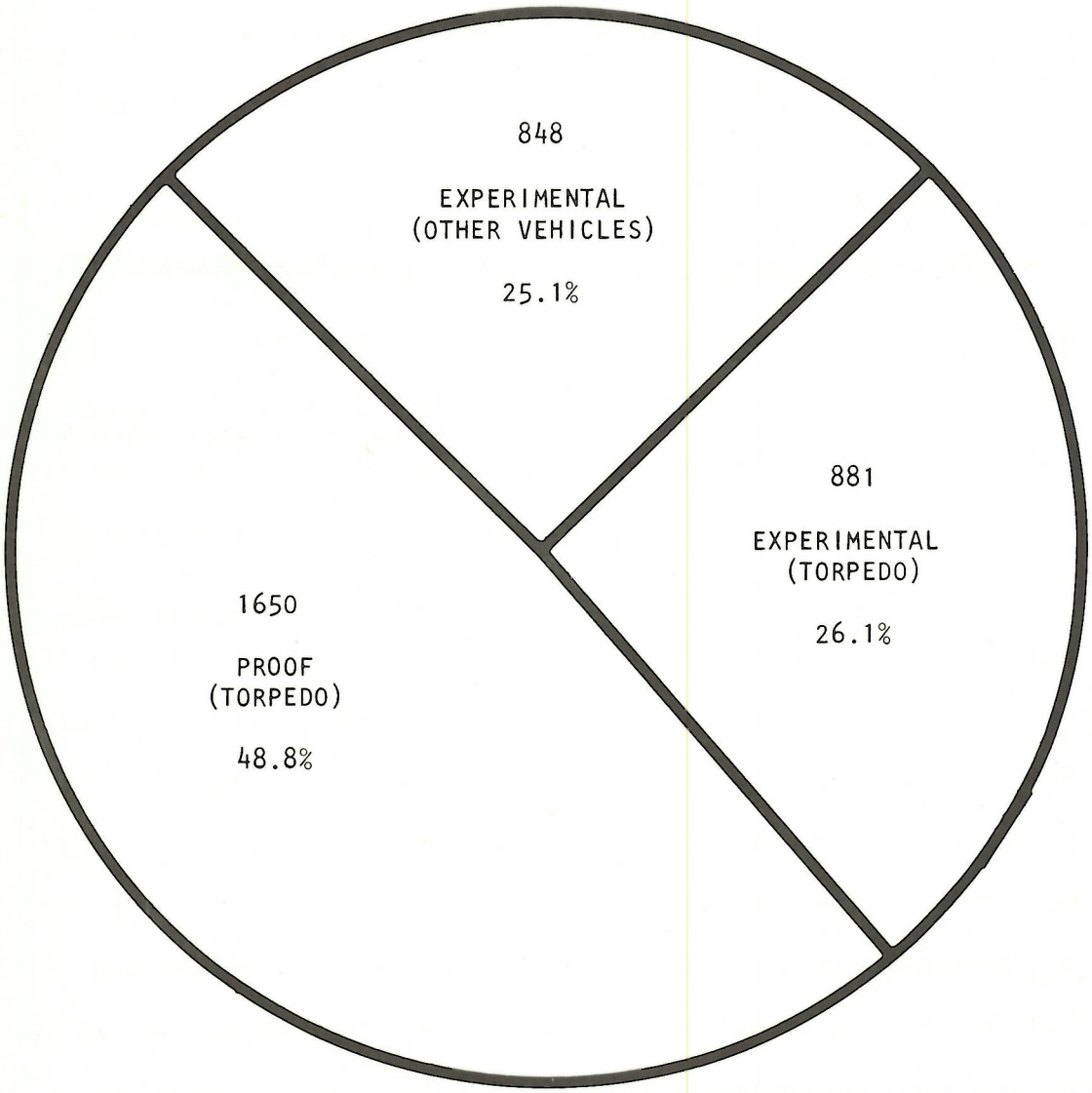
The Thirteenth Naval District 1967 Ney Memorial Awards Evaluation Board selected the Naval Torpedo Station, for the fifth consecutive year, as first place winner for Small General Messes in recognition for outstanding accomplishment in the preparation and serving of food.

Training programs were completed on site in project management for engineers and for supervisory development. Keyport was successful in obtaining one of five Navy nominations for the Career Education Awards Program. There were over 300 Merit Promotion Program Accouncements processed during the year.

The conversion of data processing systems and equipment started early in the year and included replacement of the IBM 360 and CDC 160 systems to a combined Honeywell 1200/2200 complex. The programming languages of COBOL and FORTRAN were also established as standard language for business and scientific applications.

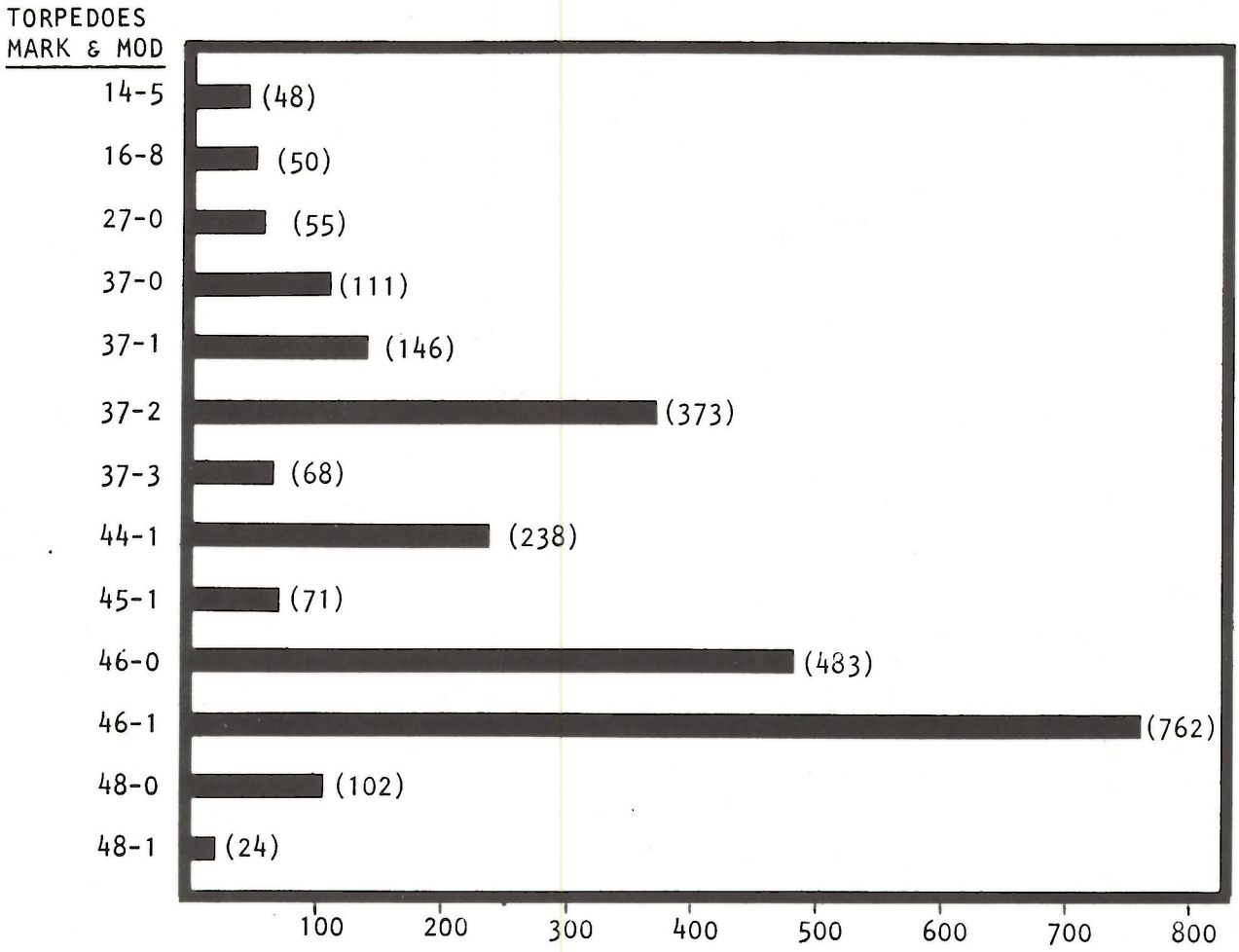
RANGE RUNS - 1967

TOTAL ALL TYPES - 3077

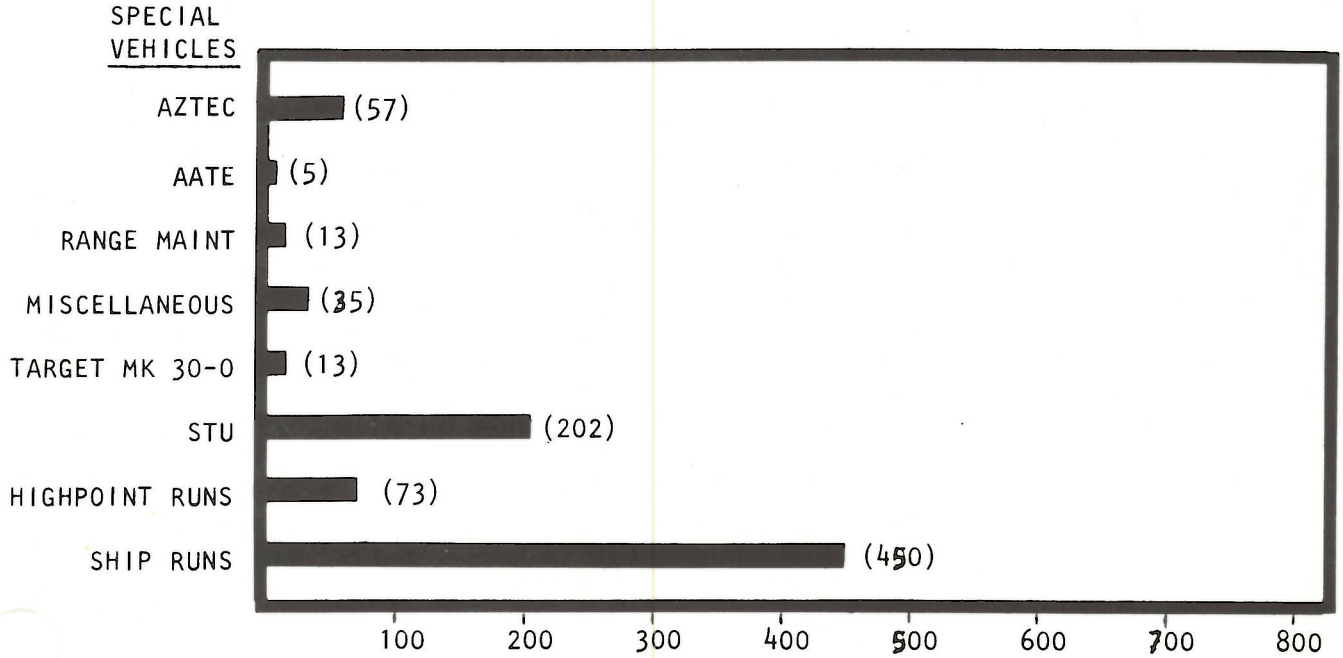


$$\frac{\text{TORPEDO EXPERIMENTAL}}{\text{ALL TORPEDO RUNS}} = \frac{881}{2531} = 34.8\%$$

1967 RANGING



TOTAL TORPEDO RANGING = 2531



TOTAL SPECIAL VEHICLE RANGING = 848

COMMANDING OFFICER	CAPT J. L. HUNNICUTT	1 JAN - 26 JUNE
	CAPT H. G. GARNETT	27 JUNE- 31 DEC

Average number of civilians - 1600
military - 240

Expansion of the Nanoose range control center on Winchelsea Island included the addition of 8,000 units of computer memory, a large (40 x 60 inch) torpedo-track plotter, and a search radar set.

Repair of the Nanoose acoustic tracking system was nearly completed for damage caused when lightning struck on 17 December 1967.

Conversion form the original buoyant type three-dimensional (3-D) tracking arrays in the Nanoose Range to rigidly mounted ones eliminated array-tilt variables from the 3-D data.

A duty station was established at the Nanoose tracking range and seven Keyport civilian technicians were assigned to permanent duty there.

The Cable-Controlled Underwater Recovery Vehicle (CURV II) was installed and used on the YF 885. Designed and built by Naval Undersea Warfare Center (NUWC), Pasadena, California, CURV II is a free-swimming vehicle with fore-and-aft and vertical propulsion motors. It is designed to recover torpedoes from depths to 2500 feet.

Department of the Navy, DOD and Congressional approval was given for a military construction project (P-008) for an 18,000 square foot addition to the Quality Evaluation Laboratory. Construction is expected to commence in the fourth quarter of FY 1969.

In April, a 25-foot radius arm centrifuge was installed near Building 108 and placed in operation. The centrifuge is capable of accelerating a load of 1000 pounds to 50 g's. Full instrumentation of the test package can be provided, and monitoring of both the centrifuge and test package is accomplished by closed circuit television.

Visitors during the year included: Captain L. G. Nebb, Commander Submarine Squadron Three; Rear Admiral Frank L. Pinney, Commander Operational Test & Evaluation Force; Admiral James S. Russell, USN (RET); Assistant Secretary of the Navy Honorable R. S. Driver; Rear Admiral F. L. Johnson, Commandant, Thirteenth Naval District; James H. Probus, Special Assistant to the Secretary of the Navy for Research & Development; Dr. George S. Sebestyen, Office of the Secretary of Defense; Captain J. C. Metzel, Director, Torpedo Mark 48 Division, Naval Ordnance Systems Command; The Honorable Floyd B. Hicks, Congressman, State of Washington; Captain Chob Siriwat, Captain Arkom Sirikacha, Captain Payao Soonthonrabhak, and Captain Vitch Chintanavitch of the Royal Thai Navy; CDR Cong In-Sok, Republic of Korea; CDR Tanticharoen Yupa, Royal Thai Navy; RADM William F. Petrovic, Commander, Puget Sound Naval Shipyard; and Captain G. W. Ringenberg, Anti-Submarine Warfare Systems Office.

In accordance with a Naval Ordnance Systems Command Task Team Report, engineering, scientific, and managerial positions were reviewed and a GS-16 Technical Director position was allocated.

The largest monetary award ever presented at Keyport for a Beneficial Suggestion went to M. E. Michalek for $1,195 for suggesting a water-tight bulkhead for the Torpedo Mark 45-1.

The following are major facility projects during 1968:

a. Start of construction of an Acoustic Test Facility.

b. Installation of a Sprinkler System in Building 15.

c. Construction of a Deep Well & Pump.

d. Roof Repairs to the Quarters.

e. Construction of Deep Draft Submarine Camels.

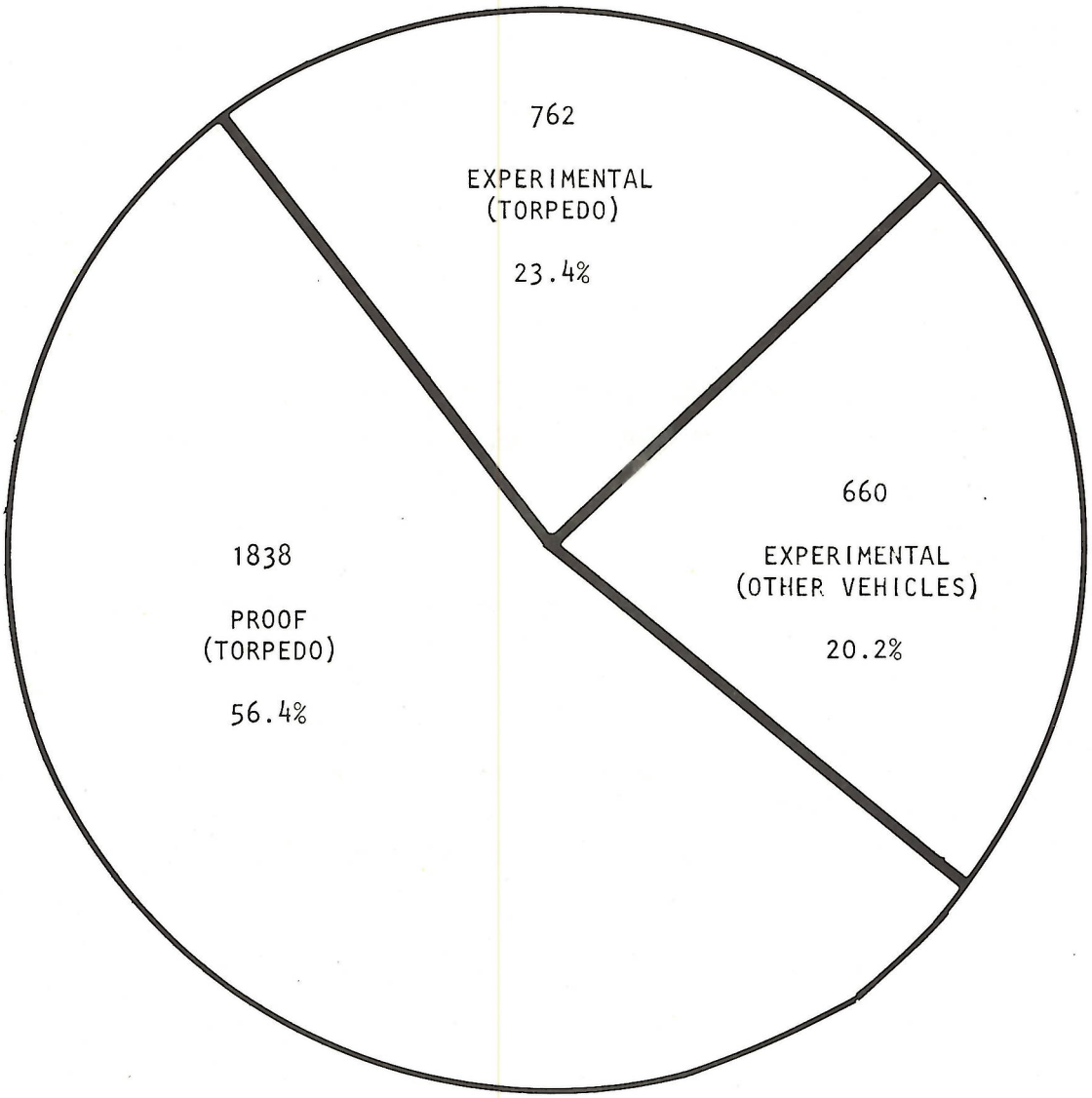
f. Construction of an Electrical Feeder/Substation.

g. Construction of the Small Craft Pier Fire Protection System.

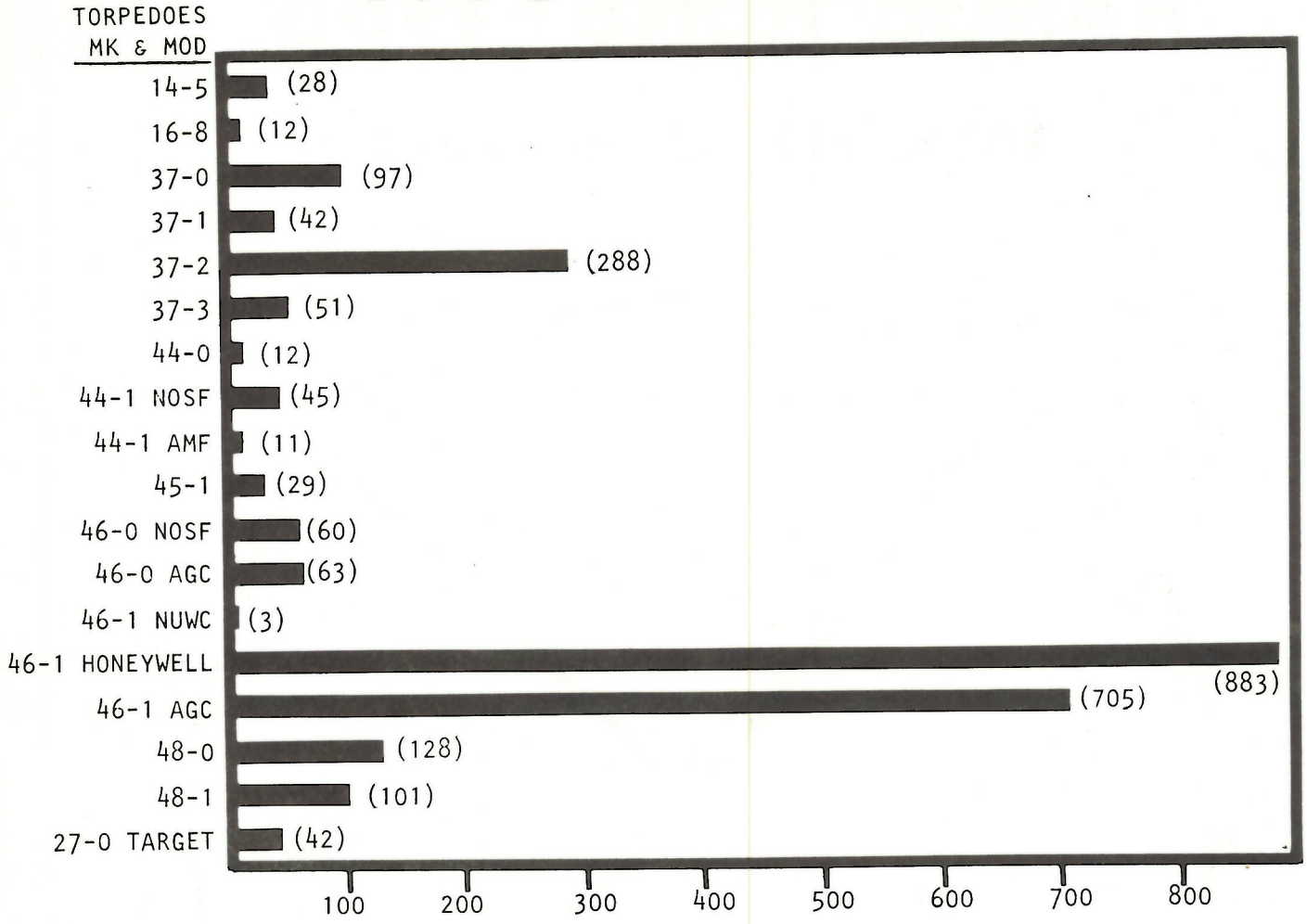
h. Completion of Building 489 Torpedo Shop.

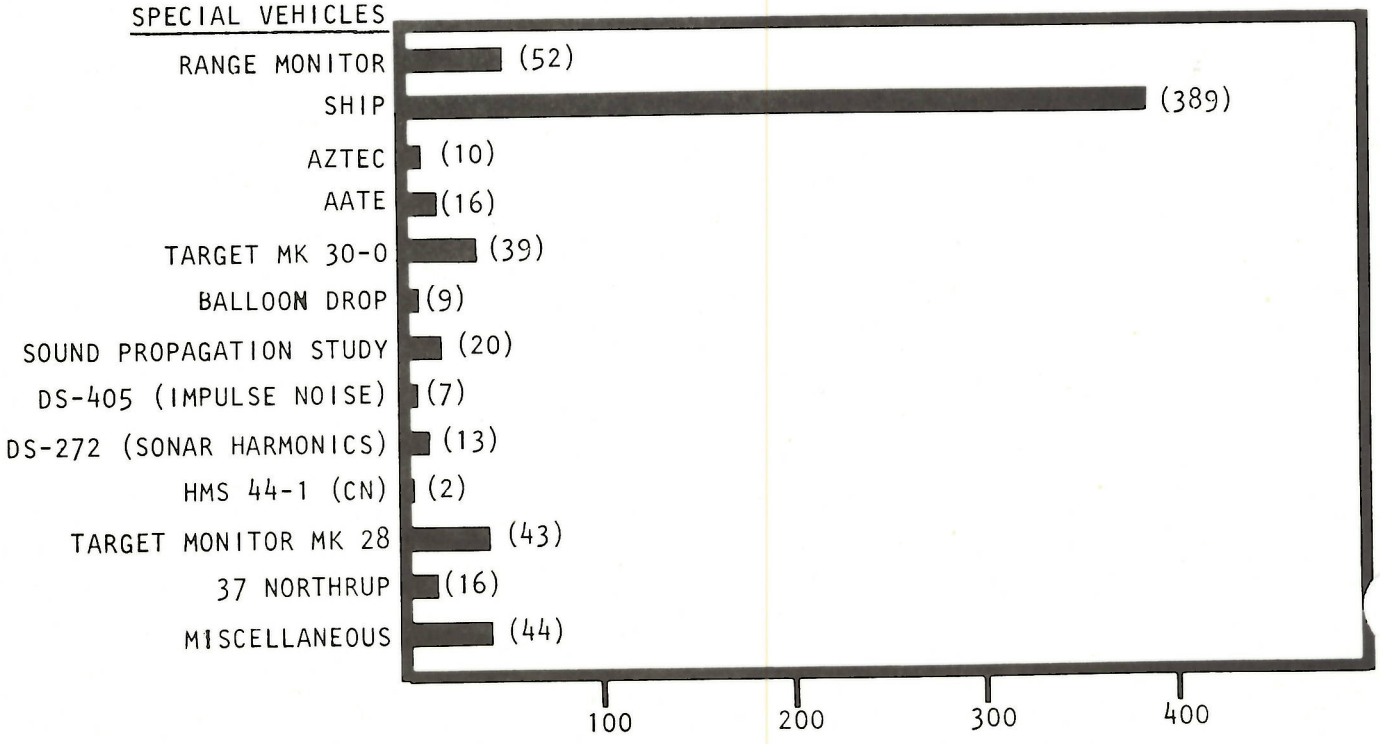
RANGE RUNS - 1968

TOTAL ALL TYPES - 3260



1968 RANGING





COMMANDING OFFICER	CAPT H. G. GARNETT	1 JAN - 31 DEC
EXECUTIVE OFFICER	CDR W. DEACON III	1 JAN - 31 DEC

Average number of civilians - 1645
enlisted military - 201
officers - 20

The Station developed and implemented a comprehensive plan for conducting local operations associated with the development of the Mark 48 Torpedo. This includes meeting all high priority tasks requested by the Naval Ordnance Systems Command Project Managers in the development, testing, and evaluation of the Torpedo Mark 48 Mod 0 and Mark 48 Mod 1. In addition, an accelerated training program was established to familiarize local personnel with the operational aspects of the Mark 48 Torpedo.

The advent of acceptance testing the Mark 48 Mod 0 pre-production prototype torpedoes was a major milestone for the Navy. Although the torpedoes are prepared by the contractors, the Station entered the phase of having responsibility for acceptance recommendations and shipping units to be used in OPEVAL (Operation Evaluation).

The station conducted proof and evaluation operations on the Torpedo Mark 46 and established the capability to prepare Ready-for-Issue (RFI) Mark 46 torpedoes. This was a pilot program to establish the feasibility of preparing torpedoes in a warshot ready status for issuance to the Fleet operating units.

The testing of units for the Mark 46 HATS program is noteworthy because it signals the advent of a Mark 46 Mod 2. This program should maintain the prominence of the Mark 46 in the station's future plans.

The Station's capability for the underwater recovery of sunken torpedoes and experimental vehicles was extended through the installation of four independent recovery systems. These included the existing operational SORD I, SOLARIS, and CURV. A recently designed SORD II is in the process of final assembly and checkout which will give the station's four major service craft recovery capability.

Repairs of damage done by lightning to Nanoose Range instrumentation in December 1967 were completed and an improved lightning-protection system was installed on Winchelsea Island range headquarters.

Design of an underwater torpedo tube installation for the 132-foot range craft YF 885 was begun. This tube will be a hydraulic one, using water to impulse the torpedoes. Existing systems at Keyport use air.

The YF 520 was delivered from overhaul late in 1969. A new fire control center was installed to house the fire control system Mark 143 giving the YF 520 complete capability to test fire modern heavy torpedoes.

A prototype bearing recording system was developed at Keyport and installed on the KL 17 which proved satisfactory for establishing torpedo heading at fire. The system photographically records a shore target and digitized torpedo tube bearing data which is used to verify torpedo deflection proofing specifications.

Two new underwater telephone arrays (UQC) were installed at the Nanoose Range which for the first time provide excellent underwater communications between the Range Officer on Winchelsea Island in control of testing and a submarine on the range.

Two cine sextant optical tracking systems were installed on the Nanoose Range to provide in-air trajectory data. Optical and underwater tracking data is correlated using real time to define ordnance trajectories from point of delivery to target. The instruments utilize photo-recorded and digital readouts to define position, altitude and special events in real time.

In January a new program called NUTRACK was employed at the digital computer underwater tracking sites. The program is used in conjunction with a new salanity, temperature, velocity of sound and pressure measuring system (STVP) also deployed in January. Used together they have considerably improved 3-D tracking accuracies at the Dabob Bay and Nanoose underwater ranges.

Keyport commenced using a large helicopter for transporting torpedoes and passengers to the joint U.S./Canadian Range.

A new $350,000 Acoustic Test Facility was delivered to the station which combines electronic test equipment on a floating structure that rises and falls with tide changes. The new facility replaces the Calibration Barge used since 1953 and will be operational early in 1970.

The position of the Technical Director, GS-16, was established and filled in August. The position provides for essential coordination, leadership and civilian continuity for all technical work assigned to the station.

The Technical Operations Office was restructured to permit full-time attention to the execution of range programs by consolidation of resources responsible for the repair, maintenance and operation of the ranges.

The station's Financial Management System was modified to provide timely and accurate financial data at the project order level, customer level, and work area level. This allows management at all levels a new vehicle for the prudent management of funds assigned.

A workload planning and forecasting system was developed and implemented to provide visibility of work currently in-house and a forecast of significant changes as a result of future workload. This system also provides a ready reference of funds assigned and expended as they relate to work in process and work accomplished.

The Automated Personnel Data Information Bank, by use of the Friden Flexowriter, was completed.

In November all wage grade personnel, except for the set aside ratings, were converted from the Navy Wage System to the Coordinated Federal Wage System.

Several high level positions were authorized and classified during 1969. The Head of the Proof Division, Proof and Test Department; Project Managers for the Mark 46 and Mark 48; and the Head of the Design Division, Research and Engineering Department, were all established at the GS-14 level.

The station worked 2,904,080 civilian manhours during 1969 incurring only two disabling work injuries and six days of lost time. The station's accident frequency and severity rates for the year were .69 and 2.07 respectively. Military personnel worked 91,499 man days with zero frequency and severity for the year.

The Combined Federal Campaign was conducted during the month of October. Naval Torpedo Station employees donated $19,294 to top the station's quota for the sixth year. An award was presented to the station for outstanding accomplishment in meeting the station's goal.

The station received a Letter of Commendation from the Commander, Naval Ordnance Systems Command, for substantially exceeding the goals for the FY 1969 Cost Reduction Program. The final validated savings of $840,000 against a goal of $536,000 represented a 158% accomplishment.

An award was received for exceeding the goal of 62% contract awards for small businesses.

An open house was held during Armed Forces Day Celebration to allow all local residents the opportunity to learn more about the activities of the Torpedo Station.

Action was completed on the development of a Long Range Master Facility Plan. This plan has been approved by the Naval Ordnance Systems Command and Naval Facilities Engineering Command and is awaiting approval by the Chief of Naval Operations for placing in effect during calendar year 1970.

Detailed facility studies were completed and preliminary plans developed for the construction of a Mark 48 Torpedo Shop. This project was submitted for consideration in the FY 1972 Military Construction Program and has received support from the Naval Ordnance Systems Command.

New construction during the year included a cable splicing facility in Building 144 for splicing long cables for underwater installations; a new 20" diameter, 800 foot deep well with a free flow of 500 GPM;

and start of a sewer project which will enlarge the treatment plant and connect the remainder of buildings to the sewer system.

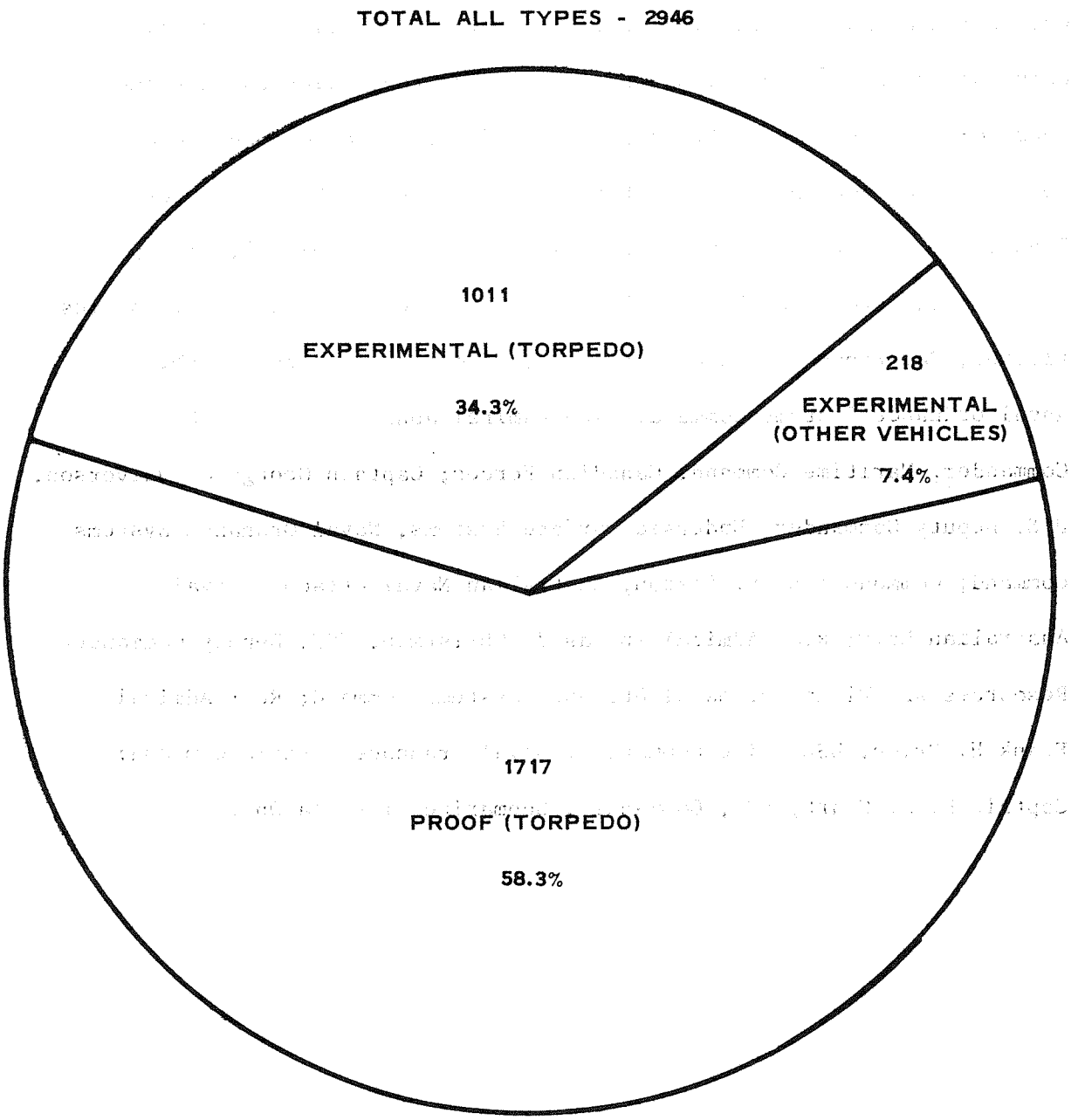
Construction of an addition of 19,000 square feet to the Quality Evaluation Laboratory was started in July and brought to over 50% completion by the end of the year. Completion is expected in March 1970 with occupancy in April.

The Torpedo Station's telephone system was changed over from Navy-owned to the Poulsbo Telephone Company in September 1969. The new system provides the following improved features: 5 lines to Bremerton; 7 direct Autovon lines; 5 direct Seattle lines which include Pier 91 and Bainbridge Island; 3 lines to Sand Point Naval Air Station; direct dialing to Poulsbo; and better service to the Puget Sound Naval Shipyard.

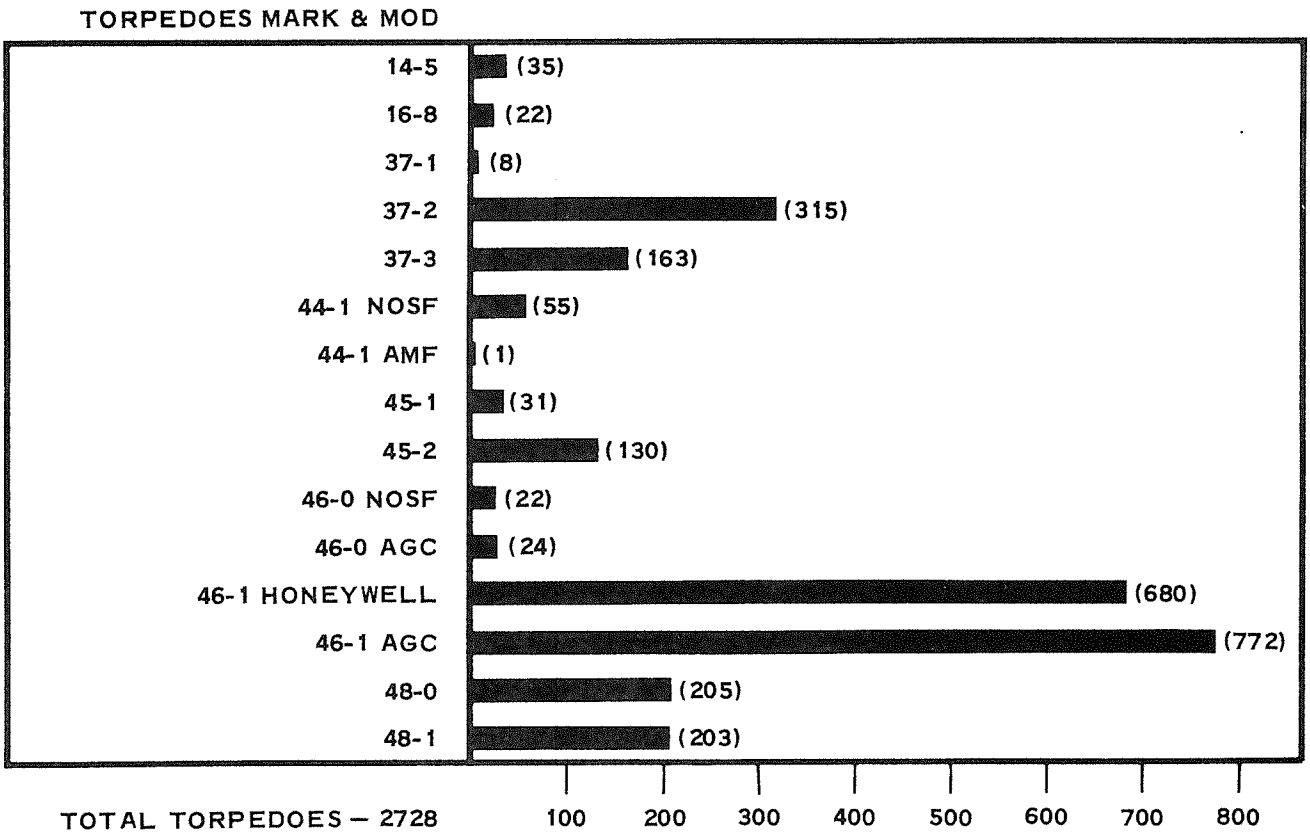
Visitors during the year included: Rear Admiral A. R. Gralla, USN, Commander, Naval Ordnance Systems Command; Captain C. B. Almy, USN, Mark 48 Program Manager, Naval Ordnance Systems Command; Captain T. C. Buell, USN, Deputy Commander, Undersea Warfare Systems, Naval Ordnance Systems Command; Vice Admiral M. Braadland, Captain O. B. Hatlem, and Captain C. O. Herlofson of the Royal Norwegian Navy; Captain D. E. Hihn, USN, Mine Warfare, Naval Ordnance Systems Command; Rear Admiral W. L. Small, USN, Commander Submarine Force, U.S. Pacific Fleet; Admiral B. A. Clarey, USN, Vice Chief of Naval Operations; Rear Admiral J. A. Charles, Royal Canadian Navy, Maritime Commander Pacific; Captain Farcan and Captain Vank of the Turkish Navy; Captain Roy B. Cowdrey, USN, Commander Submarine Squadron One; Commander N. T. Wood, USN, Commander Submarine

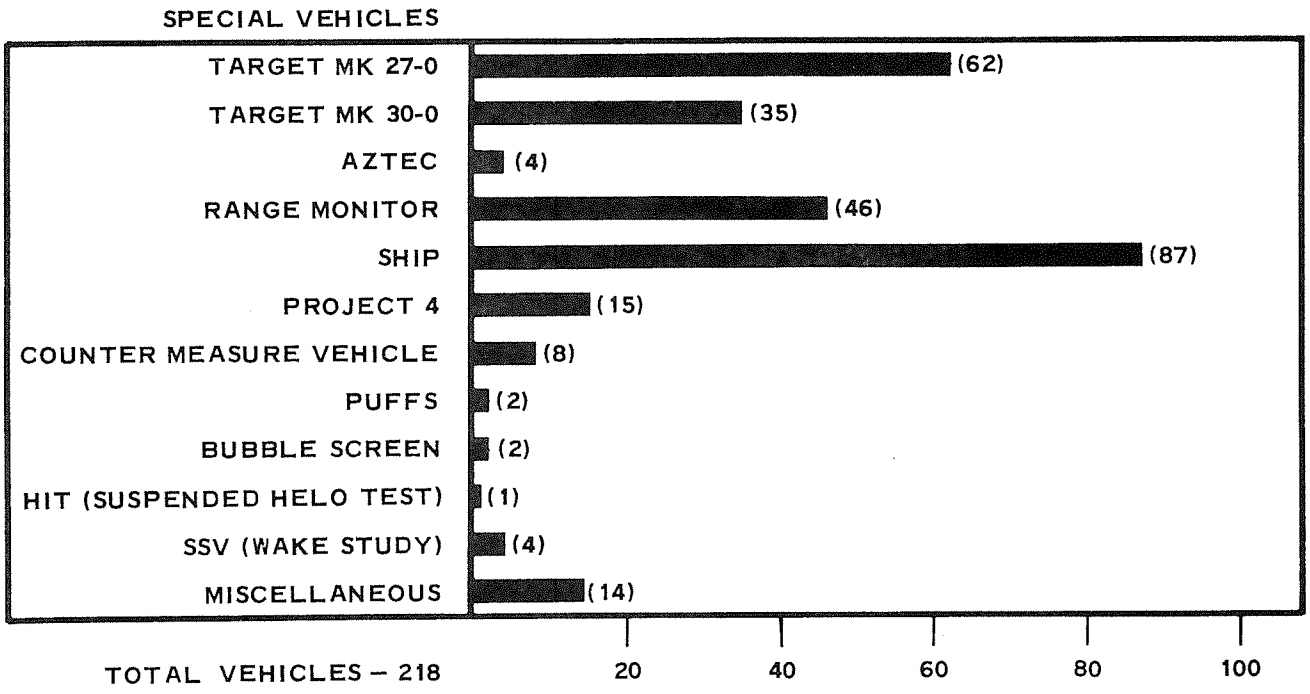
Force, U.S. Pacific Fleet; Commander M. H. Munsey, USN, USS BLUEBACK; Rear Admiral M. W. Woods, USN, Commander, Naval Ordnance Systems Command; Rear Admiral W. M. Enger, USN, Naval Facilities Engineering Command; Captain Howard F. Curren, USN, Naval Facilities Engineering Command; Captain Bernard L. Hansen, USN, Naval Operations Inspector General; Rear Admiral James V. Bartlett, USN, Deputy Commander for Planning and Programs, Naval Facilities Engineering Command; Kitsap County Legislators Joe Mentor, Gordon Walgren, C. W. (Red) Beck, Charles Elicker, Pat Wanamaker, and R. Randall; Commander S. Gurney, USN, Naval Ordnance Systems Command; Vice Admiral John C. O'Brien, CD, Commander, Maritime Command, Canadian Forces; Captain George G. Halvorson, USN, Deputy Commander, Undersea Warfare Systems, Naval Ordnance Systems Command; Commodore B. H. Loxton, Australian Naval Attache, Royal Australian Navy; Rear Admiral Thomas J. Christman, USN, Deputy Commander, Resources and Planning, Naval Ordnance Systems Command; Rear Admiral Frank H. Price, USN, Vice Commander, Naval Ordnance Systems Command; Captain R. M. Clark, USN, Commander, Submarine Flotilla One.

1969 RANGE RUNS



1969 RANGING





COMMANDING OFFICER	CAPT H. G. GARNETT	1 JAN - 31 DEC
EXECUTIVE OFFICER	CDR W. DEACON III	1 JAN - 31 DEC
TECHNICAL DIRECTOR	E. H. LESINSKI	1 JAN - 31 DEC

End of Year Personnel Ceilings:
Civilian - 2217
Military - 426

NAVTORPSTA Keyport developed and implemented a plan for the disestablishment of NAD Bangor and assumption of residual responsibilities by NTS. The merger was completed on 1 October 1970, adding two new departments (Ordnance and Public Works) plus two officers as staff to the Commanding Officer, the Chaplain and the Commanding Officer, Marine Barracks. The additional assignment as the Thirteenth Naval District Ordnance Officer was assumed by the Commanding Officer.

The Station also participated in the development of a phased implementation plan for the transfer of underwater weapon functions, personnel and equipment from the Naval Ordnance Station, Forest Park, Chicago, Ill. to Keyport. Conversion, overhaul and repair facilities at Keyport were expanded to absorb all functions being transferred, including the Torpedo Mark 37 conversion; Torpedo Mark 45 conversion; Torpedo Mark 44 rehabilitation; Functional Item Repair (FIR) and Fire Control Modular Repair Programs.

Planning for a new Mark 48 Torpedo Shop and a 60 Man Barracks was completed and incorporated in the Military Construction Program. Final approval will result in construction of these projects in 1972.

The three-dimensional (3-D) tracking range capability at the USN-RCN Nanoose Range was expanded by approximately 100 percent. The expanded range provides a tracking area of approximately 40 square miles in size, and has permitted full run evaluation of new weapons including the Torpedo Mark 48.

An 18,000 sq. ft. addition to the Quality Evaluation Laboratory building was completed and dedicated in June 1970. This new facility provides controlled environment space for the calibration laboratory, various electronic test, and engineering support areas.

A new sewage treatment plant has been approved for construction at the Indian Island Annex as part of the Pollution Control Program. Design of the Sewage Treatement Plant commenced this year and construction will begin in 1971.

Planning for providing support services to the Naval Ordnance Engineering Facility (NOEF) under construction at the Naval Torpedo Station, Bangor Annex, was coordinated by NAVTORPSTA.

The Station accomplished high priority evaluation tasks on Torpedoes Mark 48-0/2, Mark 48-1, and Mark 48 (Straight Runner) as assigned by NAVORDSYSCOM Program Managers. These programs were completed on schedule and performed in many instances under unusual and adverse conditions including unfavorable weather.

An exceptionally stringent quality control program was initiated for the Torpedo Mark 45 Conversion which was transferred from NAVORDSTA Forest Park to NAVTORPSTA Keyport. In addition to increased quality control procedures a conversion shop was established and personnel trained, to provide an uninterrupted flow of converted Torpedoes to the Fleet.

SORD II (Submerged Object Recovery Device) was completed, and on 3 June 1970 made its first recovery. SORD II is used to recover sunken torpedoes at depths in excess of 2,500 feet including units buried in mud 25 to

35 feet deep. Sunken weapons valued at approximately $25 million were recovered and returned to operation. Recovery capability now includes three systems (SOLARIS, CURV II and SORD II) that enable NTS to recover nearly all sunken vehicles.

Station task teams visited 13 activities and completed a one-year program of ordalting all computer modules in the Torpedo Mark 46 Mod 0 inventory. The task team approach provided Fleet personnel the opportunity to work with trained NAVTORPSTA personnel and improve their ability to perform simulated sea run (SSR) tests and prepare Torpedoes Mark 46 Mod 0 for firing.

NAVTORPSTA developed procedures and instrumentation for systematically measuring sonar masking and target alerting. These measurements were conducted on submarines including the BARB, PUFFER, and QUEENFISH.

A new acoustic test facility was placed in operation in April 1970. This facility, for the first time, permitted the testing of acoustic beam patterns for an assembled Torpedo Mark 48.

On 13 November 1970, Dr. Wayne Sandstrom, the first consultant for the Station was appointed. Dr. Sandstrom was formerly the Deputy Director, Applied Physics Laboratory at the University of Washington.

The assigned FY 1970 Resources Conservation (RECON) Program was exceeded by 327 percent. Although the FY 1971 program goal was increased by 266 percent over the FY 1970 goal, this newly assigned goal was reached by December 1970.

The Combined Federal Campaign was conducted in September and the Station's goal was exceeded by 133 percent.

NAVTORPSTA hosted the Fall meeting of the Underwater Ordnance Division of the American Ordnance Association. Guest speakers included VADM Eli T. Reich, USN; RADM Patrick J. Hannifin, USN; and ADM J. S. Russell, USN (Ret.). The Station also hosted community groups from Nanaimo, B. C. (adjacent to Nanoose Range) consisting of members from the press, Royal Canadian Mounted Police, Immigration authorities, port authorities, and city officials including the Mayor of Nanaimo.

Visitors during the year included:

Vice Admiral Eli T. Reich, USN, Deputy Assistant, Secretary of Defense (Material)

Rear Admiral G. G. Halvorson, USN, Naval Ordnance Systems Command (ORD-05)

Rear Admiral A. G. Esch, USN, Commander, Cruiser-Destroyer Flotilla 11

Rear Admiral Henry J. Johnson, CEC, USN, Commander, Western Division, Naval Facilities Engineering Command

Rear Admiral Ian S. McIntosh, DSO, MBE, DSC, Director of General Weapons (Naval) Ministry of Defense

Rear Admiral John A. Scott, SC, USN, Commanding Officer, Ships Parts Control Center

Rear Admiral P. J. Hannifin, USN, Commandant, Thirteenth Naval District

Rear Admiral R. L. Baughan, Jr., USN, Vice Commander, Naval Ordnance Systems Command

Rear Admiral A. S. Goodfellow, USN, Commander, Operations Test Evaluation Forces

Rear Admiral Paul L. Lacy, USN, Commander, Submarine Forces, Pacific

Captain Robert T. Lundy, USN, Commanding Officer, Naval Underwater Weapons Research and Engineering Station, Newport, RI

Captain Frank F. Clifford Jr., USN, Commander Submarine Squadron 3, San Diego

Captain Charles B. Bishop, USN, Commander, Naval Undersea Research and Development Center, San Diego

Captain Forest M. Clingan, USN, Commanding Officer, Naval Ordnance Station, Forest Park, Ill.

Captain J. C. Metzel, Jr. USN, Naval Ordnance Systems Command

Commodore Nils G. A. Gynning, Royal Swedish Navy

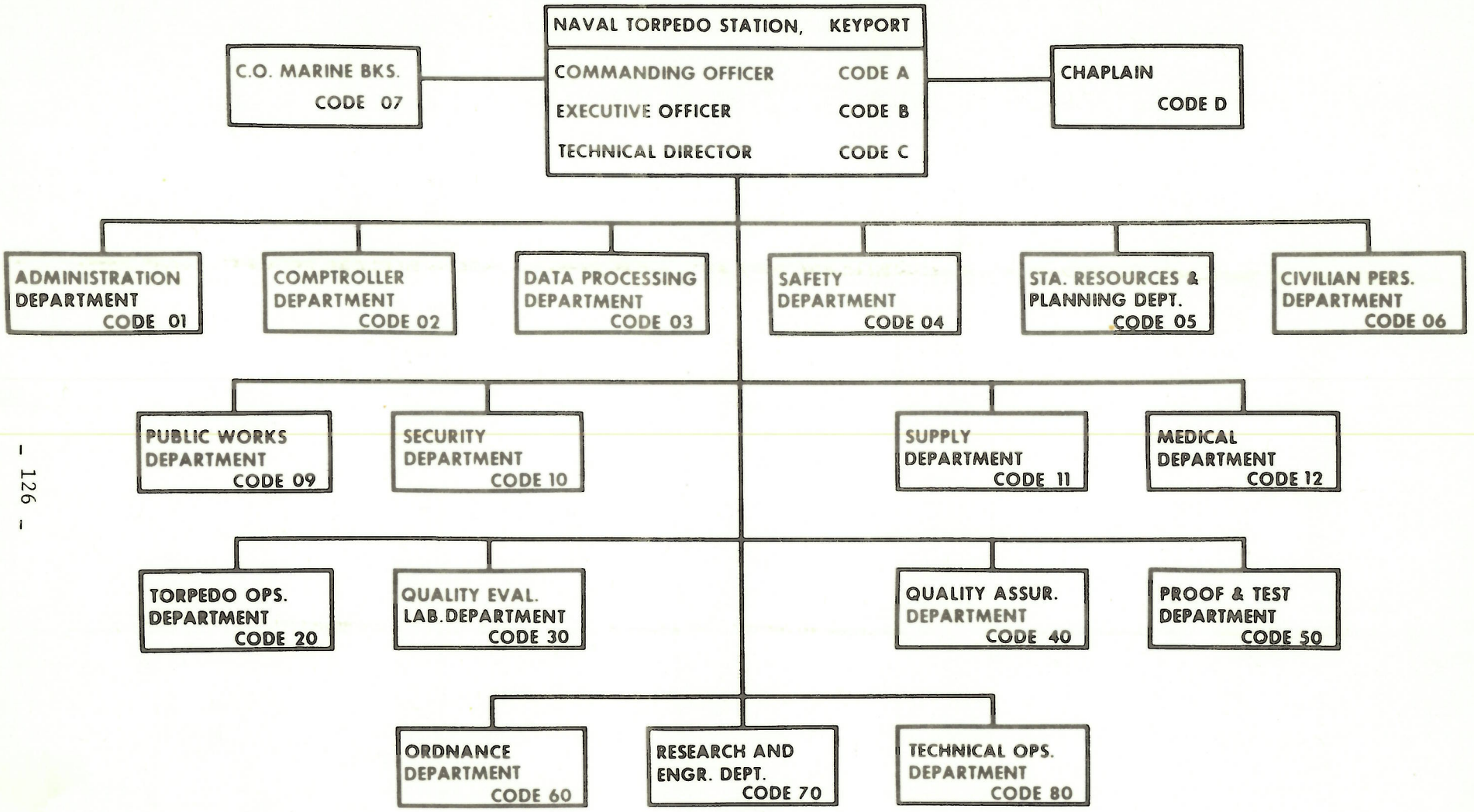
Commander Norman R. D. King, Royal Navy

Commander John S. Merewether, Royal Navy

Commander Patrick C. Burfield, Royal Navy

Mr. Charles Sandler, Naval Ordnance Systems Command

His Worship, Frank Ney, Mayor of Nanaimo, British Columbia



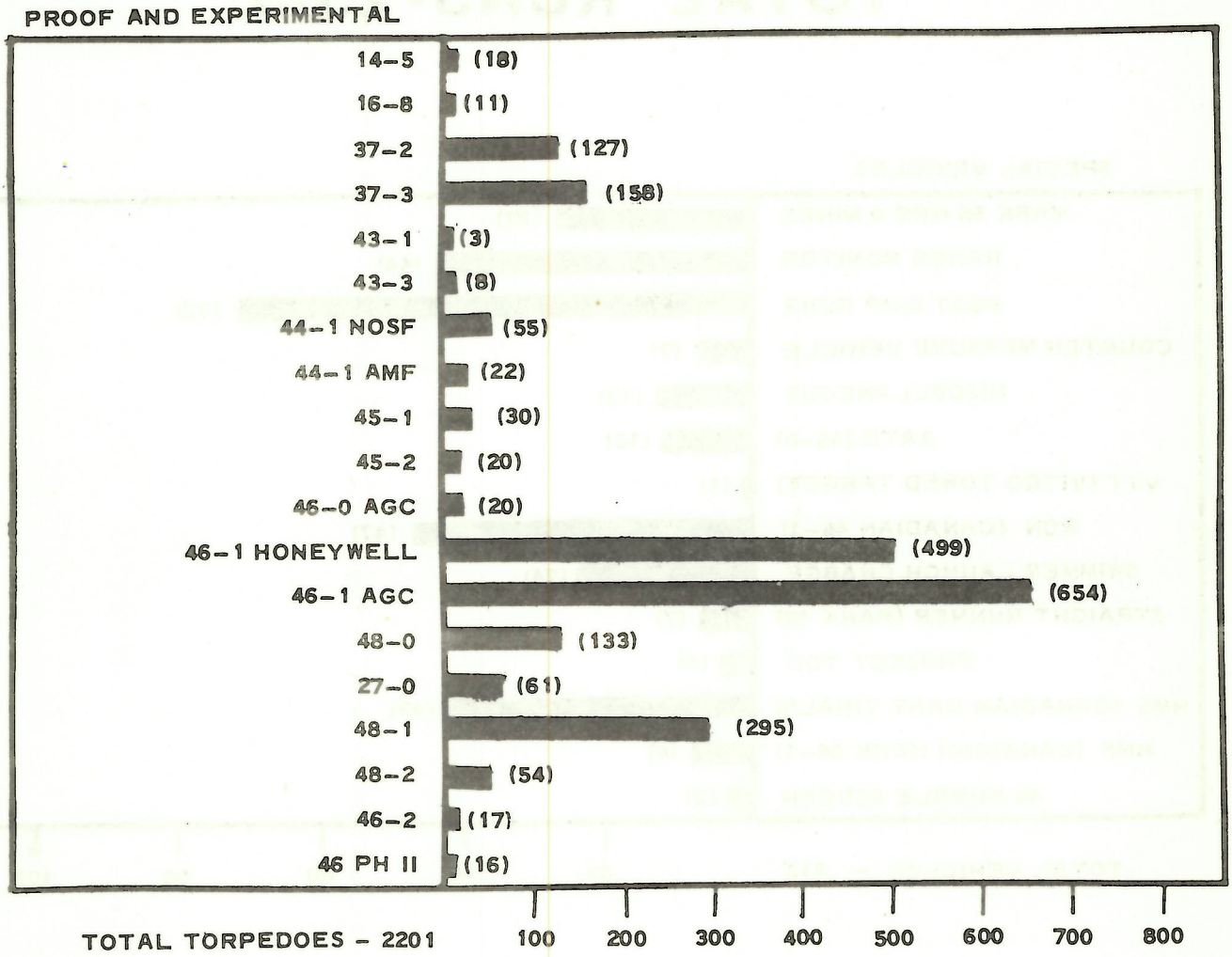
LETTER OF AUTHORIZATION
NAVORD LTR ORD-04541G 250 FVD
OF 30 OCTOBER 1970

DATE	APPROVED			
31 Dec. 1970	H. G. GARNETT, CAPT., USN, COMMANDING OFFICER	NAVAL ORDNANCE SYSTEMS COMMAND	NAVAL TORPEDO STATION KEYPORT, WASHINGTON	CHART NO. 1

1970

RANGING

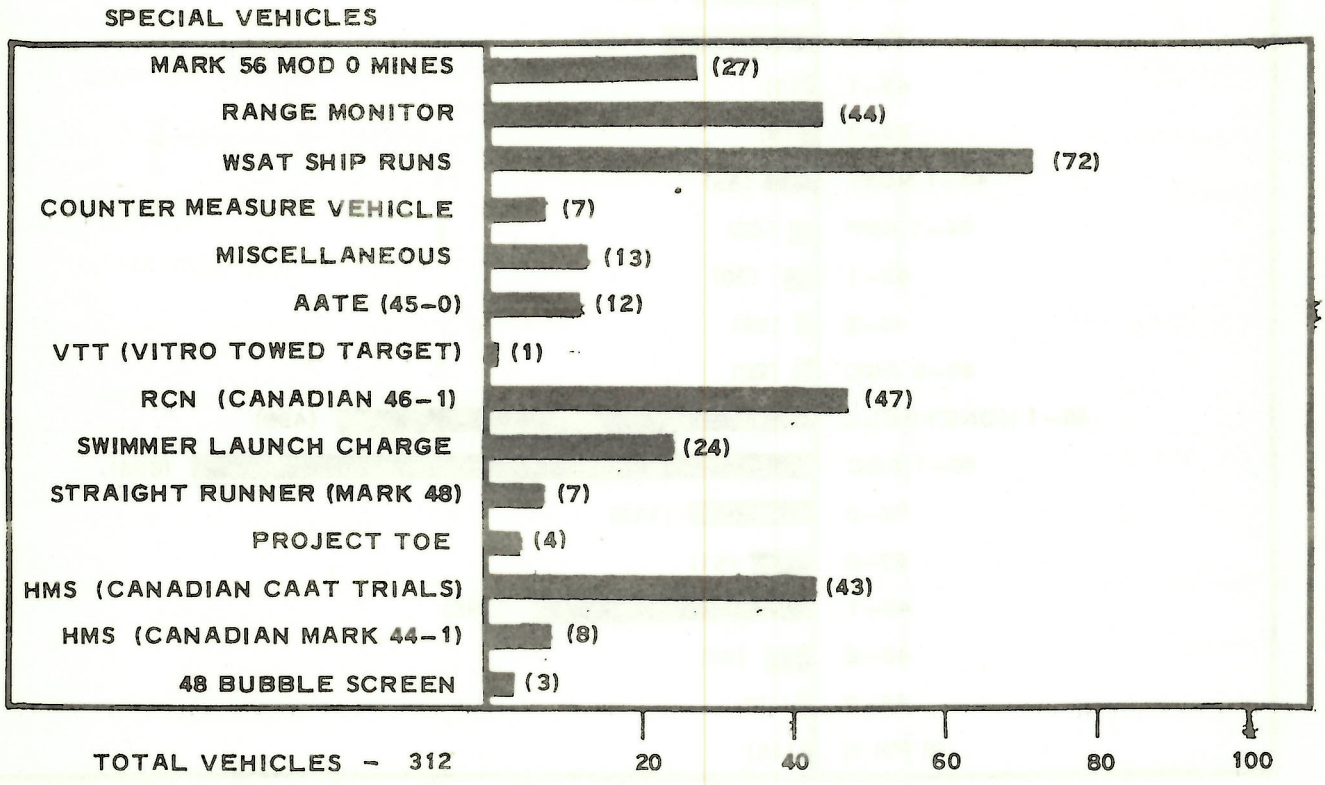
TOTAL RUNS = 2513



PROOF AND EXPERIMENTAL / TOTAL RUNS $\frac{2201}{2513} = 87.6\%$

1970
RANGING

TOTAL RUNS=2513



$$\frac{\text{SPECIAL VEHICLES}}{\text{TOTAL RUNS}} \qquad \frac{312}{2513} = 12.4\%$$

Commanding Officer	CAPT H. G. Garnett	1 Jan - 31 Dec
Executive Officer	CDR W. Deacon III	1 Jan - 30 Jun
	CDR R. D. Melim	1 Jul - 31 Dec
Technical Director	E. H. Lesinski	1 Jan - 31 Dec

End of year personnel ceilings:
Civilian - 2496
Military - 444

NAVORDINST 5450.10B, 8 June 1971, forwarded a minor revision of mission and functions assigned. Mission statement was revised to read as follows:

Mission. "To provide material and technical support for assigned weapons systems, weapons or components; proof, test and evaluate underwater weapons and components; exercise design cognizance of underwater acoustic ranges and range equipment; and perform additional tasks as directed by COMNAVORDSYSCOM."

Additional impetus was given to Station Long Range Planning by means of two off-Station conferences during March and November.

Directives issued by DOD, SECNAV and NAVORDSYSCOM placed constraints on hiring to fill vacant positions and directed reduction of Station average grade level.

By end of year, contract plans and specifications for the new Mark 48 Torpedo Shop were prepared by WESTNAVFACENGCOM and construction will start in July 1972 for completion in 1973.

A MILCON Project for a 60-man barracks was approved by the Military Construction Review Board (MCRB) and the Congress for FY-72. Preliminary site survey and design work was begun by the contractor.

High priority test and evaluation of Torpedoes Mark 48-0/2 and Torpedo Mark 48-1 were conducted. The end product of these evaluations was the Navy's selection of one design for Fleet usage.

High response was established at the various technical levels including shops, engineering, in-water testing, technical review and evaluation of run data, and reporting. Specific program support included test and evaluation of all Torpedo Mark 48s used for the TECHEVAL, OPEVAL, and Selection Test Program.

A capability was established on a high priority basis for the warshot preparation of four Torpedoes Mark 48 to be fired against hulk submarines and hulk surface ships, along with special instrumentation to determine relative degree of success of each of these warshot firings. The warshot capability was established, firing submarine loaded, and weapons fired with the successful sinking of all hulk targets.

The Station provided technical support to the Atlantic Underwater Test and Evaluation Center (AUTEC) during the various phases of TECHEVAL and OPEVAL of Torpedo Mark 48 tests conducted in that area.

In-water testing was completed on the Torpedo Mark 46 manufactured by Aerojet General and Honeywell Corporations. A special screening program was established to detect defective components, and these components were replaced with good units before processing torpedoes for Fleet delivery. In conjunction with NAVORDSYSCOM and NUC Pasadena, established modernization procedures for the refurbishment and modernization of Torpedoes Mark 46 in the Fleet. Particular emphasis was placed on quality control and shop procedures to insure that high quality units were recycled to the Fleet.

Design and construction of a Bottom-Mounted Instrumentation System (BOMIS), was initiated. This system will provide oceanographic measurements automatically with no time delay, with a subsequent decrease in cost of operation, range craft, and range personnel.

An improved 3-D tracking software system identified as NUTRAC was installed. This program includes an improved mathematical model for ray path corrections, additional options for data acquisition and display, and improved mathematical sub-routines for data validity determination.

The Station provided technical support to the BARSTUR Range at Barking Sands, Kauai, Hawaii, for the repair and replacement of underwater tracking equipment damaged by storms in that area.

Phaseout and transfer of personnel, equipment, and workload from the Naval Ordnance Station Forest Park to this activity was completed. Approximately 350 man-years of workload and a large amount of equipment were transferred from Forest Park to Keyport during this phaseout program. Work in process on the Torpedoes Mark 37, 44, and 45 was transferred to NTS Keyport without disruption of scheduled delivery to the Fleet.

Provided technical and logistic support in the construction and outfitting of buildings at the Naval Ordnance Engineering Facility, which permitted occupancy during September 1971.

The Station's existing job order and payroll system was converted to NOMIS standards established by NAVORDSYSCOM.

The Quality Evaluation Laboratory was redesignated Quality Evaluation and Engineering Laboratory.

Operations in the ordnance area continued to shift from production and outloading to RSS&I activities. Only three ships were outloaded for MTMTS during the year with a total of 25,819 measurement tons of ammunition.

Throughout the year torpedo support capabilities were improved by the installation of additional numerical control equipment and employing new industrial processes, including space-age welding techniques.

Repair renovation, conversion and improvement programs associated with Torpedoes Mark 37, 44, 45 and 46 comprised the bulk of this workload.

The Nanoose 3-D range was expanded to provide over 50 square miles of tracking area.

The Station was designated as the Navy's ASW Fire Control Modular Repair Center and the required capabilities were established to support these functions.

Training courses on Torpedoes Mark 37, 44 and 46 were conducted for various foreign officers from Turkey, Chile, Australia, Korea, Thailand, and the Philippine Islands.

The Naval Supply Systems Command awarded NAVTORPSTA the Small Business Award for its Fiscal Year 1971 effort of awarding 61.8 percent value of its contracts to small business.

Participation in the Combined Federal Campaign Drive resulted in over $27,000, which exceeded the community assigned goal by 35 percent.

The Annual Navy Relief Fund Drive for 1971 netted over $5,000, which exceeded the COMTHIRTEEN subarea assigned quota.

The Command received a letter of commendation from the Commander, Naval Ordnance Systems Command for substantially exceeding the goal for the FY-71 Cost Reduction Program. The final validated savings were $2,765,000; achieving the assigned goal of $2 million by 138 percent. The FY-72 assigned Cost Reduction Program goal of $1 million was reached by 13 September 1971. COMNAVORDSYSCOM recommended to the Chief of Naval Material that NAVTORPSTA be recognized as NAVORD's outstanding field activity in the field of Cost Reduction for FY-1971.

Visitors during the year included:

RADM G. G. Halvorson, USN, Naval Ordnance Systems Command (PMO-402)

RADM W. L. McDonald, USN, Commandant, Thirteenth Naval District

CAPT W. C. Dotson, USN, Naval Ordnance Systems Command (ORD-541)

CDR H. M. Leavitt, USN, Naval Ordnance Systems Command (ORD-5412)

RADM E. G. Fairfax, USN, Deputy Naval Inspector General

CDR R. E. Hatcher, USN, COMSUBPAC

The Honorable Julia Butler Hansen, House of Representatives

RADM T. J. Christman, USN, Naval Ordnance Systems Command

CAPT R. F. Rockwell, USN, Naval Ordnance Systems Command (ORD-051)

CAPT W. C. Klemm, USN, Naval Ordnance Systems Command (ORD-5432)

CAPT M. C. McFarland, USN, Naval Ordnance Systems Command

Dr. H. E. Nash, Technical Director, Naval Underwater Systems Center

Commodore R. V. Henning, CAF, COMTEVFORPAC

CAPT E. R. Ross, CAF, Director, Maritime Combat Systems

RADM E. W. Cooke, USN, COMSUBFLOT ONE

CDR C. Chisum, USN, ASW-156

CDR G. Nelson, USN, Naval Ordnance Systems Command (ORD-5424)

CDR J. Langenheim, USN, SUBPAC

LCDR G. Lamperd, RAN, Australian Attache

Mr. A. G. Graham, Australian Embassy

RADM J. Williams, Jr, USN, Director, Attack Submarine Div., DCNO (Submarines)

CAPT H. L. Carpenter, USN, Naval Ordnance Systems Command (ORD-054)

Honorable J. W. Warner, Under Secretary of the Navy

CAPT Atakli, Turkish Navy

CAPT C. L. Scherrer, USN, CO, NAVORDSTA, Louisville

CAPT Burvill, RN (and party), Ministry of Defense (Navy) Government of the United Kingdom

CAPT H. F. Griffith, USN, Naval Facilities Engineering Command (Code 21)

CAPT W. Dedrick, USN, Naval Ordnance Systems Command (ORD 05)

Mr. M. L. Dunn, Armed Forces Safety Board

Commanding Officer	CAPT H. G. Garnett	1 Jan - 29 Jun
	CDR R. D. Melim	29 Jun - 28 Aug
	CAPT J. L. Carter	28 Aug - 31 Dec
Executive Officer	CDR R. D. Melim	1 Jan - 31 Dec
Technical Director	E. H. Lesinski	1 Jan - 31 Dec

End of year personnel ceilings:

Civilian - 2420 (Permanent)
308 (Temporary)

Military

Navy Officer	-	32
Enlisted	-	249
Marine Officer	-	5
Enlisted	-	139

Total NAVTORPSTA Personnel = 3,153

The end of year personnel strength of 2,728 civilian and 425 military personnel reached a new high of 3,153, exceeding the previous high of 2,856 established during World War II. Increased civilian employment was due primarily to shiploading effort in support of Southeast Asia operations.

Construction was started on the Mark 48 Shop to provide 52,000 square feet of space for conducting the proofing, testing and evaluation of the torpedo Mark 48. In addition, a 60 man bachelor enlisted quarters was built to provide semi-private quarters for Navy petty officers.

Keyport participated in a Veteran's Job Fair held in Bremerton, Washington on 25 October 1972. (As a result, several veterans were given temporary appointments and others are being considered as vacancies occur.)

For the ninth consecutive year Keyport surpassed its Combined Federal Campaign fund drive goal. The Station also exceeded all other Kitsap Naval activities in contributions to the Navy Relief Society.

Surveillance personnel evaluated a total of 111 torpedoes at LANTFLT and PACFLT activities, comprising 60 Torpedo Mark 37, 7 Mark 45, 8 Mark 44, and 36 Mark 46 weapons. In addition to Fleet-return surveillance, all teams evaluated two or three recently prepared torpedoes (prepared less than 60 days) at each Fleet preparation activity visited so that the activity could assess its current capability.

The Station conducted a special study for the Mark 48 program manager to determine the number of Mark 48 torpedoes required over the next 10 years. Several alternatives were generated based on differing assumptions of the length of an anticipated war, the own-submarine attrition rate, the post-war inventory requirement and the Mark 48 kill probability. The results of the study were presented to NAVORD and DOD.

The NAVORD Torpedo Mark 48 Project Manager, initiated the Failure Analysis Task Team under the chairmanship of NTS Keyport. The purpose of the team was to "Conduct an in-depth analysis of failures occuring during proofing". This new task is considered a significant change to NTS Keyport's participation in the failure analysis effort conducted in the Torpedo Mark 48 program.

The Ordnance Department outloaded over 200,000 short tons of conventional ammunition to support Southeast Asia operations. The transshipment workload reached a peak during May when nearly 33,000 tons were shipped. This was a significant accomplishment considering that even though most of the work was completed using temporary employees, an excellent safety record for wharf operations was maintained.

Investigations were made of the underwater noise radiated, the underwater pressures created, and the wakes generated by a hydrofoil craft, the PLAINVIEW (AGEH-1), while foil-borne.

A Torpedo Radiated Noise Summarization for TNAAS (Torpedo Noise Acquisition and Analysis System) was written, providing the Navy with a model which standardizes torpedo acoustical signature analyses.

During the year, action was initiated to establish a cooperative program between the Station and the Navy's Postgraduate School at Monterey, California. The purpose of the program is to provide Postgraduate School faculty members and students an opportunity to pursue research to the solution of Station long range Anti-Submarine Warfare (ASW) tasks. Keyport's potential involvement will include enrollment of scientific personnel in the postgraduate school to obtain advanced degrees while participating in ASW research related programs.

NAVORD designated Keyport as a "Career Development Center" under NAVORD's "Weapons Management Systems Development Program". The program provides field training for engineers who will be assigned to NAVORD Headquarters after completion of the program.

The Station's Equal Employment Opportunity (EEO) program received additional emphasis including the establishment of a full-time EEO coordinator. The EEO Committee is actively involved in training programs and personnel seminars as a means of educating the total work force in matters relating to EEO. During the year, over 25 minority members and 225 women received training on the EEO program.

Activity in the Station's Fire Control repair program included certification for repair and refurbishment of the Fire Control Mark 113 modules and the Mark 38 and Mark 53 attack consoles.

An Automated Test Equipment (ATE) program was introduced for the testing of FIR and Fire Control modules. The test equipment hardware and software was designed to provide capability for automatic testing of all modern torpedo FIR components. The system has proven to significantly reduce the time required for conducting tests with the additional benefits of added consistency and higher quality.

Keyport was tasked to convert over 200 torpedoes Mark 37 Mod 0 to the latest Mod 2 and Mod 3 configurations. Included is the installation of 45 major ordalts and manufacture and assembly of other mechanical and electrical components. The significant changes in the conversion include modification to the battery compartment, after-body assembly and tail cone section.

"Keyport was designated by the Naval Ordnance Systems Command as their outstanding field activity within the area of cost reduction during Fiscal Year 1972. Nearly 60 studies were validated during Fiscal Year 1973 with savings totaling $3,723,000. This 372 percent of the assigned goal of $1,000,000 was surpassed in October 1972 with validated savings reaching $2,234,000 by December 1972. NTS has also been nominated by NAVORDSYSCOM for recognition by the Secretary of the Navy for outstanding performance during Fiscal Year 1972 in the area of cost reduction."

Visitors during the year included:

RADM R. H. Leir, Canadian Armed Forces, CANMARPAC

RADM W. L. McDonald, USN, Commandant Thirteenth Naval District

Honorable Robert A. Frosch, Assistant Secretary of the Navy (R&D)

Mr. A. G. Rumbold, English citizen

RADM Parker B. Armstrong, USN, Project Manager, Anti-submarine Warfare Systems Project Office

RADM Mark W. Woods, USN, Commander, Naval Ordnance Systems Command

Honorable Charles L. Ill, Assistant Secretary of the Navy (I&L)

RADM G. G. Halvorson, Mark 48 Project Manager

Mr. Frank Gilliam, NAVORDSYSCOM (ORD-05C)

CAPT U. Gilli, Italian Navy

Vice ADM Sir Richard I. Peek, Chief of Naval Staff, Royal Australian Navy

Herr Wolf, Federal Republic of Germany

Herr Barghorn, Federal Republic of Germany

ADM Celal Eyiceoglu, Commander-in-Chief, Turksih Navy

BRIG Gen Henry R. Delmar, USA, Commander Western Area, MTMTS

LCDR Ercin Yegin, Turkish Navy

LCDR C. Ogbonnaya Kaja, Nigerian Navy

Mr. John J. Cubley, Anti-Submarine Warfare Systems Project Office (ASW-12)

RADM Philip A. Watson, RN

General Dominador F. Garcia (Ret) Republic of the Phillipines

Mr. John H. Huth, Special Assistant to Director of Navy Laboratories

CAPT L. H. Oliphant, DSC, RN

Mr. Isaac W. Cole, EEO Coordinator, NAVORDSYSCOM

LCDR Lamperd, Royal Australian Navy

Mr. F. J. Schiavi, Logistics Support Directorate, NAVORDSYSCOM (ORD-04B)

RADM Walter Dedrick, USN, NAVORDSYSCOM (PMO-042)

Honorable Robert D. Nesen, Assistant Secretary of the Navy

RADM Joseph W. Russell, USN, COMSUBFLOT ONE

CAPT Kenneth W. Bradley, British Naval Staff

Honorable Joseph A. Grimes Jr., Deputy Under Secretary of the Navy

LT General Walter J. Woolwine, Jr., USA, Joint Chiefs of Staff (J-4)

CAPT Julian St. Aubyn Sayer, RN, United Kingdom

CAPT Henri E. Rambonnet, RNN, The Netherlands

CAPT M. C. McFarland, USN, Naval Underwater Systems Center

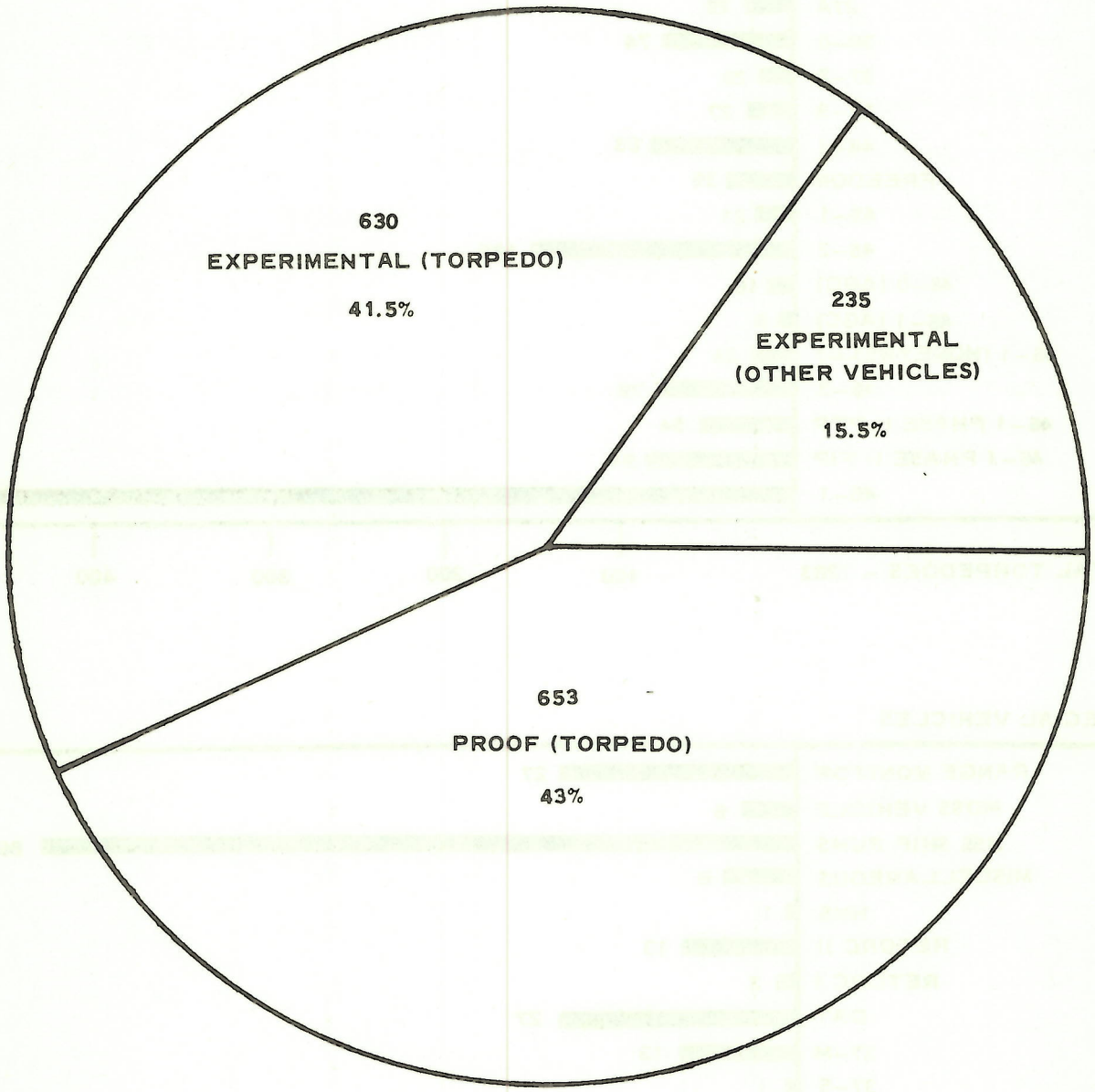
Mr. Marc Hansen, NAVORDSYSCOM (ORD-05B)

Dr. T. Rona, Boeing Company

Dean J. M. Wozencraft, Naval Postgraduate School, Monterey

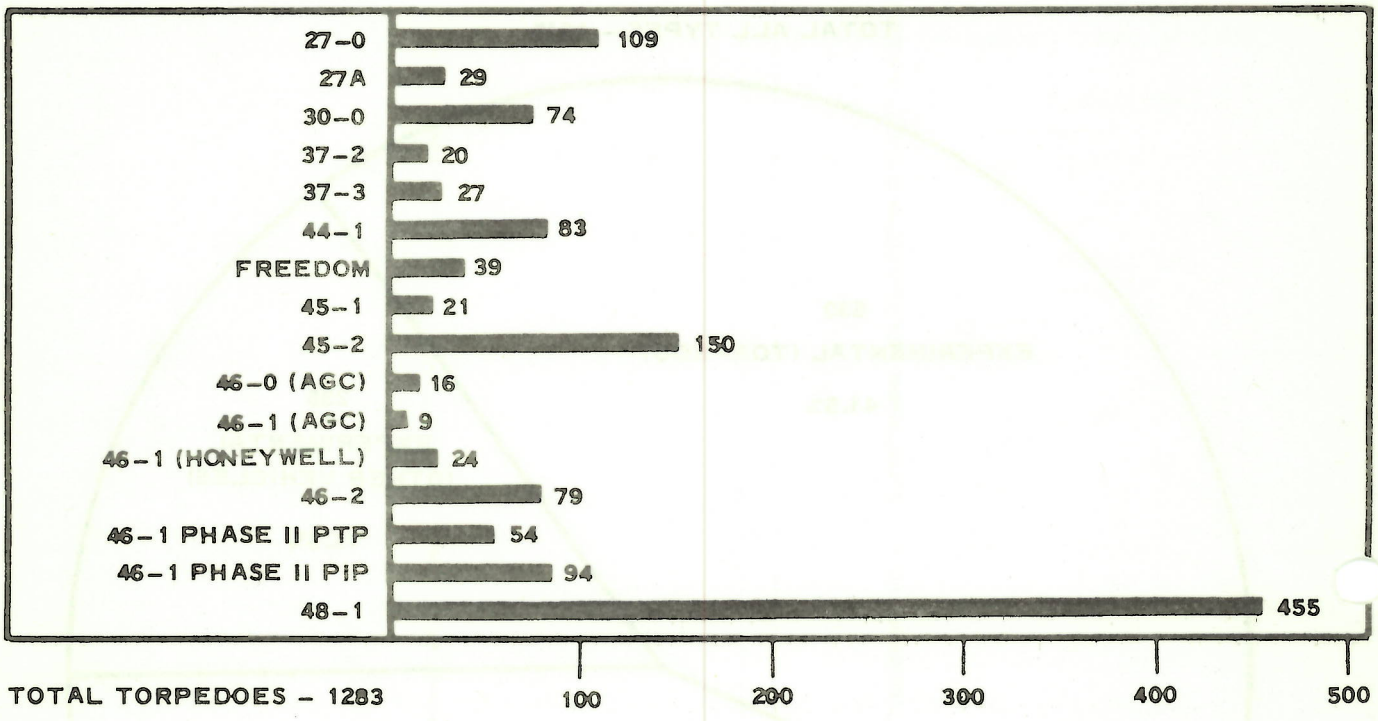
1972 RANGE RUNS

TOTAL ALL TYPES – 1518



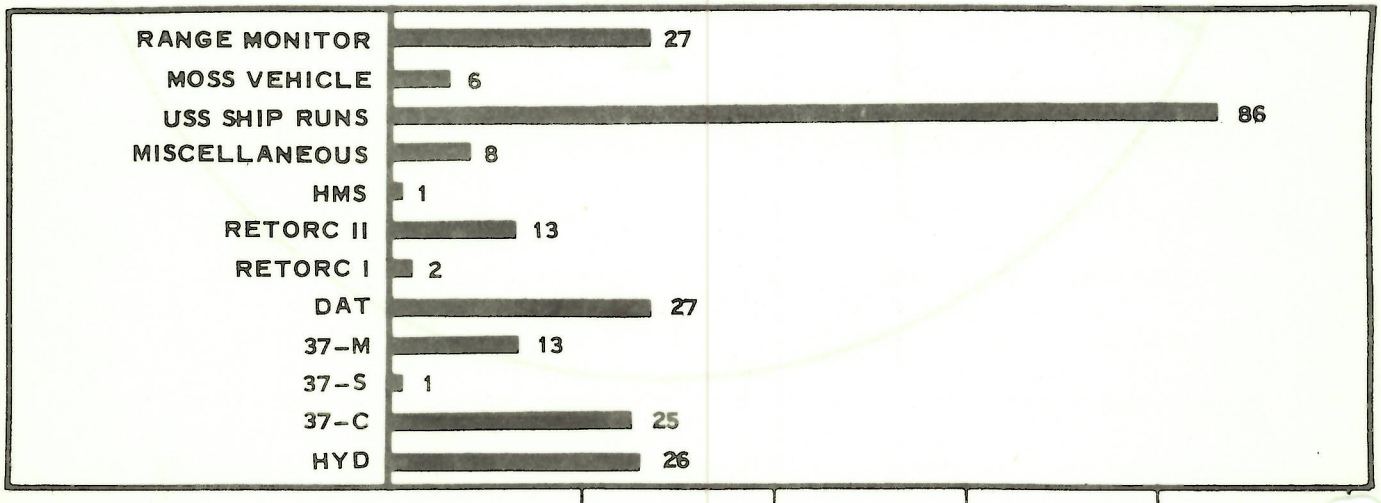
1972 RANGING

TORPEDOES MARK & MOD



TOTAL TORPEDOES - 1283

SPECIAL VEHICLES



TOTAL VEHICLES - 235

1973
COMMAND HISTORY

Commanding Officer	Capt J. L. Carter	1 Jan - 31 Dec
Executive Officer	CDR R. D. Melim	1 Jan - 31 Dec
Technical Director	E. H. Lesinski	1 Jan - 31 Dec

End of year personnel ceilings:

Civilian:		
Permanent	2461	
Temporary	37	
Total Civilian	2498	
Military:		
Navy		
Officer	25	
Enlisted	249	
Marine		
Officer	5	
Enlisted	136	
Total Military	429	

Total NAVTORPSTA Personnel - 2927

Two major construction projects were completed. The new Torpedo MK 48 shop (Bldg 514) was dedicated in a ribbon cutting ceremony by ADM Dedrick June 21st and the Bachelor Enlisted Quarters were opened for occupancy April 9.

The first production test in a three-year, $2.7 million FIR/Fire Control Automatic Test Equipment Program was conducted in May using a Torpedo MK 46 computer. The immediate savings will be the reduction in time required for torpedo MK 46 ORDALT component tests. Completion of this auto-test development program is expected by June 1975. At that time many of the Torpedo MK 48 FIR tests such as command control, guidance control, power control, homing control, transducer, transmitter and receiver units will be accomplished with this system.

With the installation of a new walk in chamber in September, Keyport now has the capability of conducting temperature and humidity tests on the complete Torpedo MK 48, Target MK 30, CAPTOR, or any other weapon system in this size range. The chamber has a temperature range of -100°F to 250°F and a relative humidity of 20% to 90%.

Ranging of the first target MK 30 Mod 1 at the Dabob Range occurred in August. The target was also used for WSAT's as a sonar/torpedo target aboard the USS BERKELEY in December.

Coordination responsibilities were assigned to Keyport for NAVORD's CAPTOR In-Service Reliability Program. A procedure was developed by the QEEL Department to monitor the in-service reliability of the total CAPTOR Weapon System, including the test and support equipment, by integration and evaluation of all pertinent data generated through related test programs. One notable test of the CAPTOR system was an air launch using a submarine as a target.

Six torpedoes MK 37 Mod 3 were launched and tracked in March and April under an Arctic Ice Floe in the North Bering Sea. Valuable information was obtained from the performance of these torpedoes against real and artificial targets in a severe environment.

Two HARPOON Missiles were fired from a foilborne hydrofoil for evaluation in December. A first at the Nanoose Range.

During a national alert, NAVTORPSTA was directed to apply maximum effort to processing of Torpedoes MK 48. Special commendations were received from NAVORDSYSCOM relative to the result of this effort.

1200 torpedoes MK 46 Mod 1 were completed under the improvement program which includes class B maintenance as well as updating the computers, autopilots and installation of all outstanding ORDALTS and ACP's. 360 torpedoes MK 46 Mod 0 underwent Class B maintenance.

Part of Keyport's function in support of assigned weapons systems is the conversion and evaluation of torpedoes. The following indicates units completed:

a. Totals for the year: Conversions

Torpedo MK	From	To	Units Completed
37	Mod 0	Mod 3	30
45	Mod 0-1	Mod 2	124

b. Totals for the year: Evaluations

Torpedo MK	Units Completed
37	102
44	71
45	19
46	76

In compliance with NAVORDSYSCOM announcement of August 3, Keyport began coordination efforts toward the disestablishment of Naval Ammunition Depot, Hawaii. Ninety civilian positions associated with the transferred functions will be assigned to NAVTORPSTA but their physical location will remain in Hawaii. Transferred functions include conducting WSAT, Mobile target MK 30 operations, MK 48 TCP tests, providing range support services on the Barstur underwater range, weapons system analysis services and engineering support for the MK 48 weapon system. Completion of the transfer is scheduled for January 6, 1974.

NTS Keyport is carrying out the Trident coordination function by serving as the direct liaison between the Station, NAVORD, and cognizant Trident offices, such as the Trident Project Management Office, Washington, D.C. Also a portion of this coordination effort is directed toward the internal organization of Keyport itself in such areas as consultation and advisement of Station management on Trident planning to allow for coordination of Station mission accomplisment with developing Trident programs.

It was announced January 26 that the Station would be closed for the Christmas holiday; December 22 - January 1. The predicted advantages were a reduction if operating overhead and annual maintenance costs. A value engineering study showed that $120,000 savings resulted from the closure in the areas of manpower and utilities.

A new Equal Employment Opportunity (EEO) specialist position was established to support the EEO program. Some of the EEO responsibilities include implementation and administration of the Affirmative Action Program, assistance for EEO counselors and committee members and coordination with outside activities and minority groups.

Georgia La Ducer achieved a first for the women employees of Keyport. She was one of six employees selected for a four-year machinist apprentice program which at completion will promote her to a journeyman machinist.

The beneficial suggestion program paid off for Keyport in tangible savings of $1,196,245 as a result of 345 suggestions.

1973 saw a noticeable reduction in the Station's number of disabling work injuries. In 1972 there were 21 injuries compared with only 7 this year; a 300% improvement.

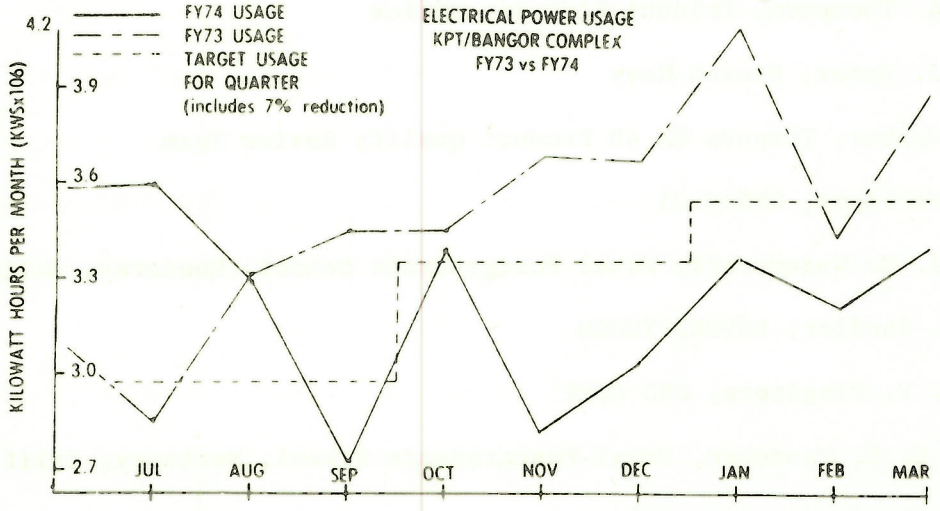
NAVTORPSTA was designated by NAVORD as the number four field activity in cost reductions. 54 studies were validated during FY 1973 with savings of $3,192,000. This was 319% of the $1,000,000 goal.

The United Veterans Council of Kitsap County presented a certificate of appreciation to Captain Carter on April 27th in recognition of the Station's effort toward the employment of veterans.

The energy crisis also hit Keyport. One area of major concern was electrical power consumption. In August, Bonneville Power Administration informed Keyport of a 25% power reduction requirements. As the graph below indicates, Keyport was successful in obtaining the desired power consumption reduction through such conservation efforts as thermostat reductions, power equipment curtailment and lighting shutdown.

Electricity Consumption Continues Low

Use of electrical power aboard the NavTorpSta Keyport/Bangor Annex complex continues below target levels for the fifth consecutive month. Consumption has averaged well below fiscal year 1973 levels since a concerted allhands conservation effort began last summer.



Visitors during the year included:

Mr. J. Warner, Secretary of the Navy

Dr. D. S. Potter, Assistant Secretary of the Navy, Research & Development

Mr. M. C. Hansen, NAVORDSYSCOM

RADM T. E. Bass III, Thirtennth Naval District

RADM Dedrick, NAVORDSYSCOM

RADM. G. V. Fliflet, Naval Reserve Readiness Command, Seattle

RADM A. R. Marschall, CEC Commander Naval Facilities

RADM F. D. McMullen, COMM SUB PAC

RADM J. W. Russel, COMM SUB FLOTONE

RADM R. E. Spreen, NAVORDSYSCOM

RADM C. A. H. Trost, Submarine Training Group, West

RADM P. A. Watson, Royal Navy Director, General Weapons

CAPT H. S. Clay, U.S.S. Hunley

CAPT G. H. Lewis, Central NOMIS Office

CAPT H. Michel, French Navy

CAPT A. Thompson, Trident Planning Office

CAPT J. Waser, French Navy

CAPT Webber, Torpedo MK 48 Product Quality Review Team

CAPT Williams, OPNAV 21

Dean J. M. Wozencraft, Naval Postgraduate School, Monterey, Calif

Mr. C. Sandler, NAVORDSYSCOM

Mr. N. V. Pingitore, OSD COMP

Prof. C. E. Menneken, Naval Postgraduate School, Monterey, Calif.

Mr. V. B. Bandjunis, OASD

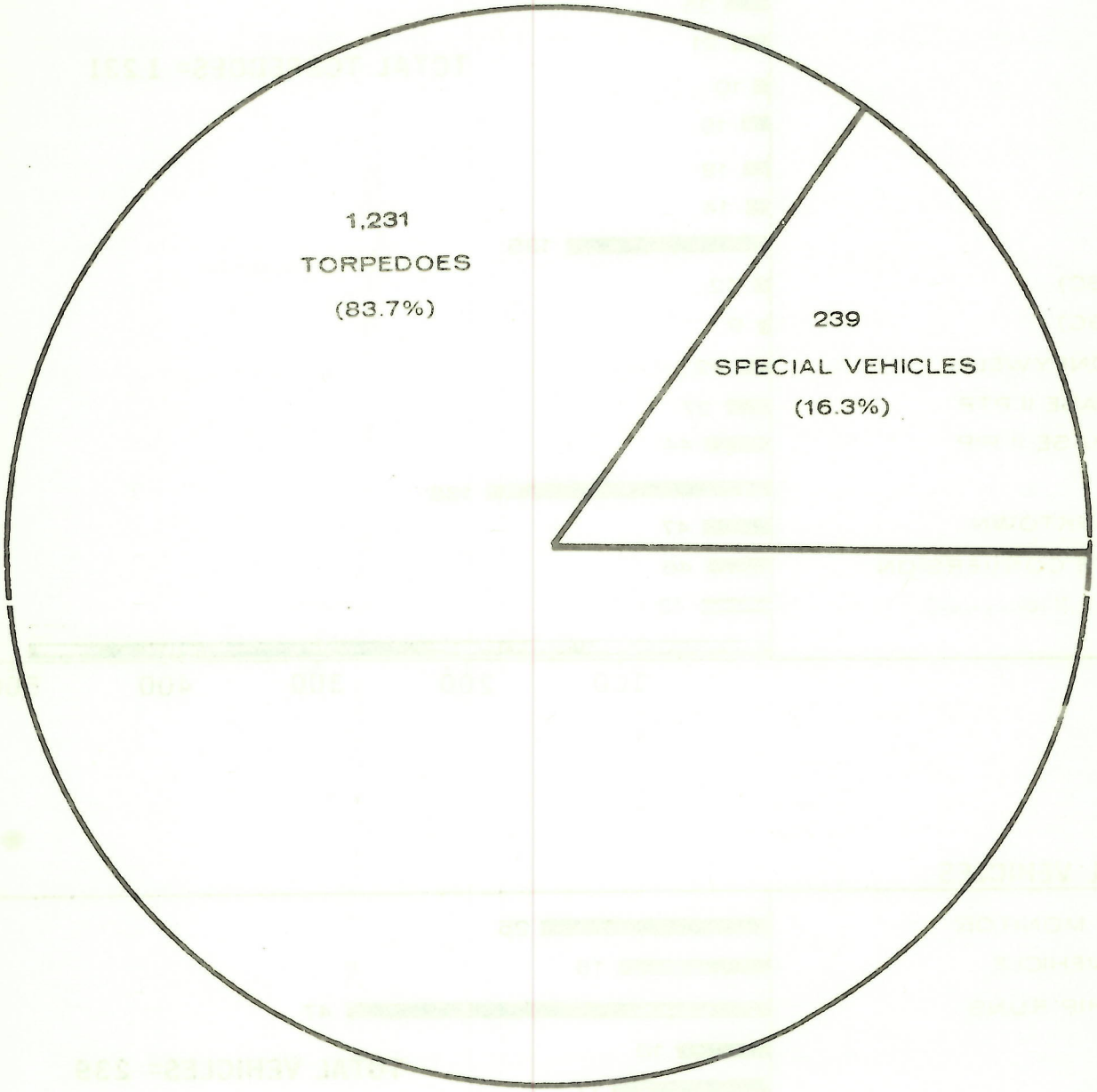
CDR T. Edson, OASD

CDR J. Florimond, French Navy

CDR P. Lefbure-Du-Prey, French Navy

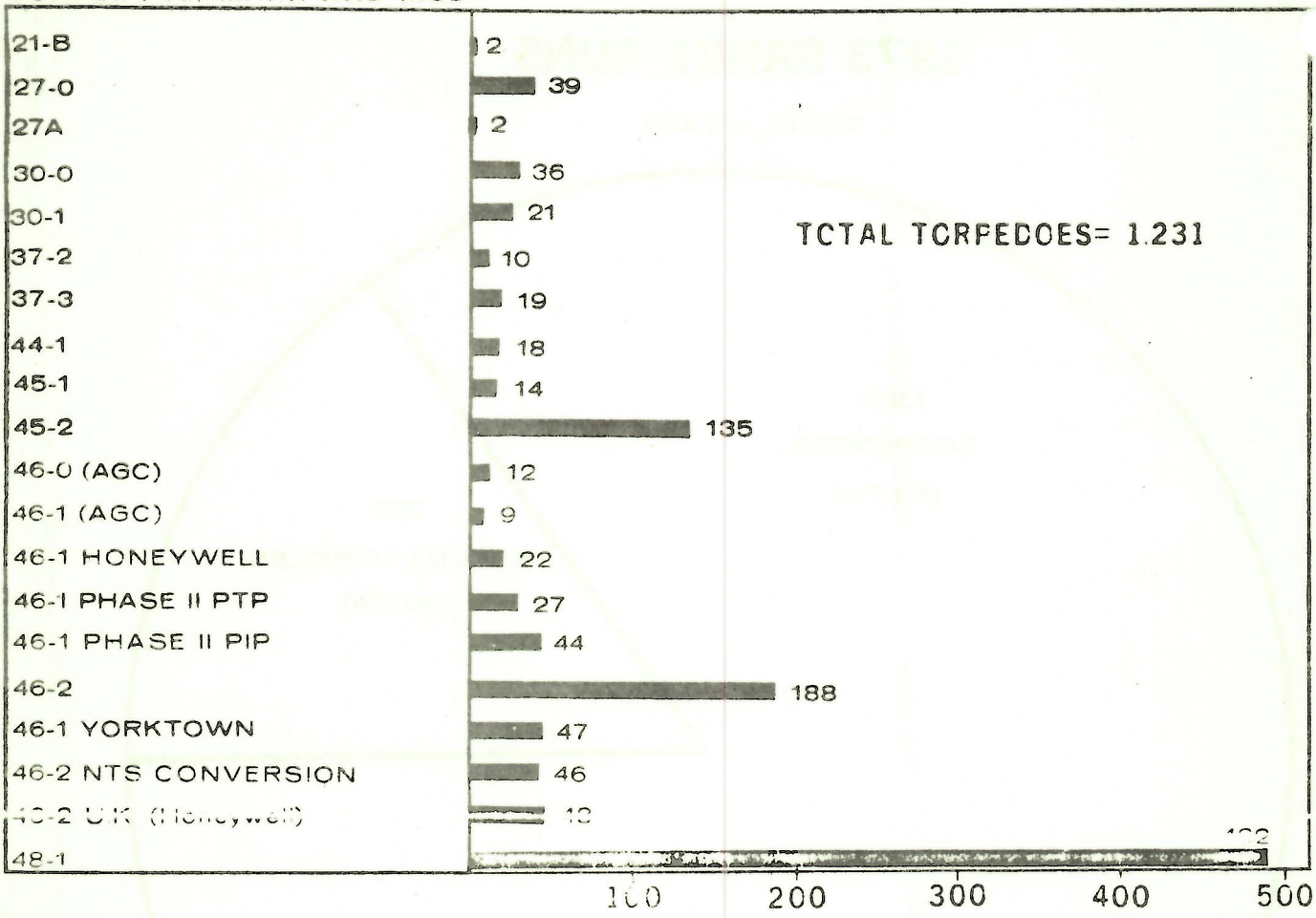
1973 RANGE RUNS

TOTAL = 1,470

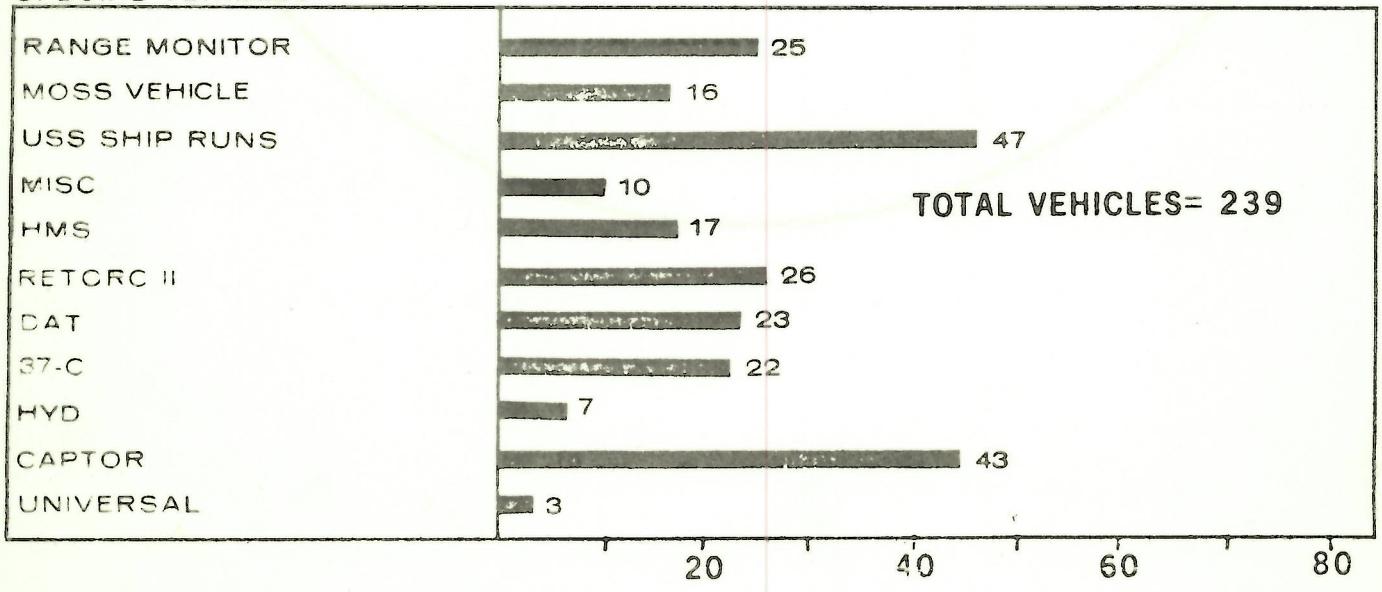


1973 RANGING

TORPEDOES, MARK AND MOD



SPECIAL VEHICLES



1974
COMMAND HISTORY

Commanding Officer	Capt J. L. Carter	1 Jan - 31 Dec
Executive Officer	CDR R. D. Melim	1 Jan - 31 Dec
Technical Director	E. H. Lesinski	1 Jan - 31 Dec

Year End personnel strength:

Civilian:		
Permanent	2594	
Temporary	83	
Total Civilian	2677	
Military:		
Navy		
Officer	23	
Enlisted	275	
Marine		
Officer	4	
Enlisted	145	
Total Military	447	

Total NAVTORPSTA Personnel 3124

Major new construction on the Station was limited to a bulk storage facility for Otto fuel which was completed in May. This facility greatly improved the safety and the ease of handling Otto fuel by providing storage in either bulk or drum form.

A new system for deploying instrumentation was installed for test purposes February 26, at the Station's Nanoose Range. This new system was named BOMIS I (Bottom Mounted Instrumentation System). BOMIS I is still in operation at years end, 1,300 feet below the surface of the water. In the future it is expected that BOMIS will reduce the requirements for range instrumentation craft.

Conversion of the Torpedo Mark 37 Mod 0 to Mod 2 was accomplished this year. Continuation of this new program was guaranteed with the receipt of a substantial project order for the Netherlands.

Under the improvement program 1704 Torpedoes Mark 46 Mod 1 were completed. This was the result of a midyear increase from 100 per month to 165 per month due largely to the withdrawal of NWS Yorktown from this program. The ability of the Station to absorb this great increase in workload is primarily because per unit time was cut from 3 hours to .8 hour by the use of automatic test equipment. Included are Class B maintenance, and updating the computers and autopilots, as well as installation of all outstanding ORDALTS and ECPs. Class B maintenance was performed on 365 Torpedoes Mark 46 Mod 0.

Part of the NAVTORPSTA function in support of assigned weapons systems is conversion and refurbishment of torpedoes and targets. The following listed units were completed:

a. Totals for the year: Conversions

Torpedo MK	From	To	Units Completed
37	Mod 0	Mod 2	10
37	Mod 0	Mod 3	40
45	Mod 0-1	Mod 2	75

b. Total for the year: Refurbishments

Target MK/Mod	Units Completed
27/0	15

This became a record year for PARR (Performance Analysis and Reliability Reporting), when 300 Torpedo Mark 48 firing attempts were made from 35 submarines. This represents 40 percent of the entire program since it began 3½ years ago.

A portion of the Station workload was concerned with foreign sales.

Number of Units	Torpedo and Mod	Purchaser
50	MK 46 - 2	Israel
200	MK 46 - 2	Italy

A dramatic increase in ranging occurred this year primarily because of the disestablishment of the Naval Ammunition Depot, Oahu and the transfer of associated functions to NAVTORPSTA on January 6. This involved more than 90 civilian positions which have been reassigned to NTS Keyport but are still physically located in Hawaii. Transferred functions include conducting Weapons System Accuracy Trials (WSAT), Mobile ASW Target Mark 30 operations, Torpedo Mark 48 Training Certification Program (TCP) tests, providing range support services on the Pacific Missile Range Facility Underwater Range (BARSTUR) weapons systems analysis services, technical assistance to COMTHIRDFLT and engineering support for the Torpedo Mark 48 weapon system. The formulation of the Naval Torpedo Station Detachment, Hawaii (Code 90) added substantially to the Station's Fleet Support function by expanding direct services to the Pacific Fleet.

The Station again curtailed operations for the year-end holiday season December 25, 1974 through January 1, 1975. One of the advantages gained this year was the accomplishment of a complete inventory of torpedo components. This would have been nearly impossible if the production areas had been working.

Trident coordination effort continued. Excavation and foundation construction work at the Trident site began.

Cindy Allpress achieved a first for women at NTS Keyport by becoming the first badged uniformed female employee. She was assigned to the Security Department.

A portion of Station involvement in community social economic affairs is the Stay-In-School program. Disadvantaged students between the ages of 16 and 22 years were eligible for enrollment in this program for a maximum of 16 working hours per week. The program doubled

enrollment from the previous year (12 to 25 enrollees).

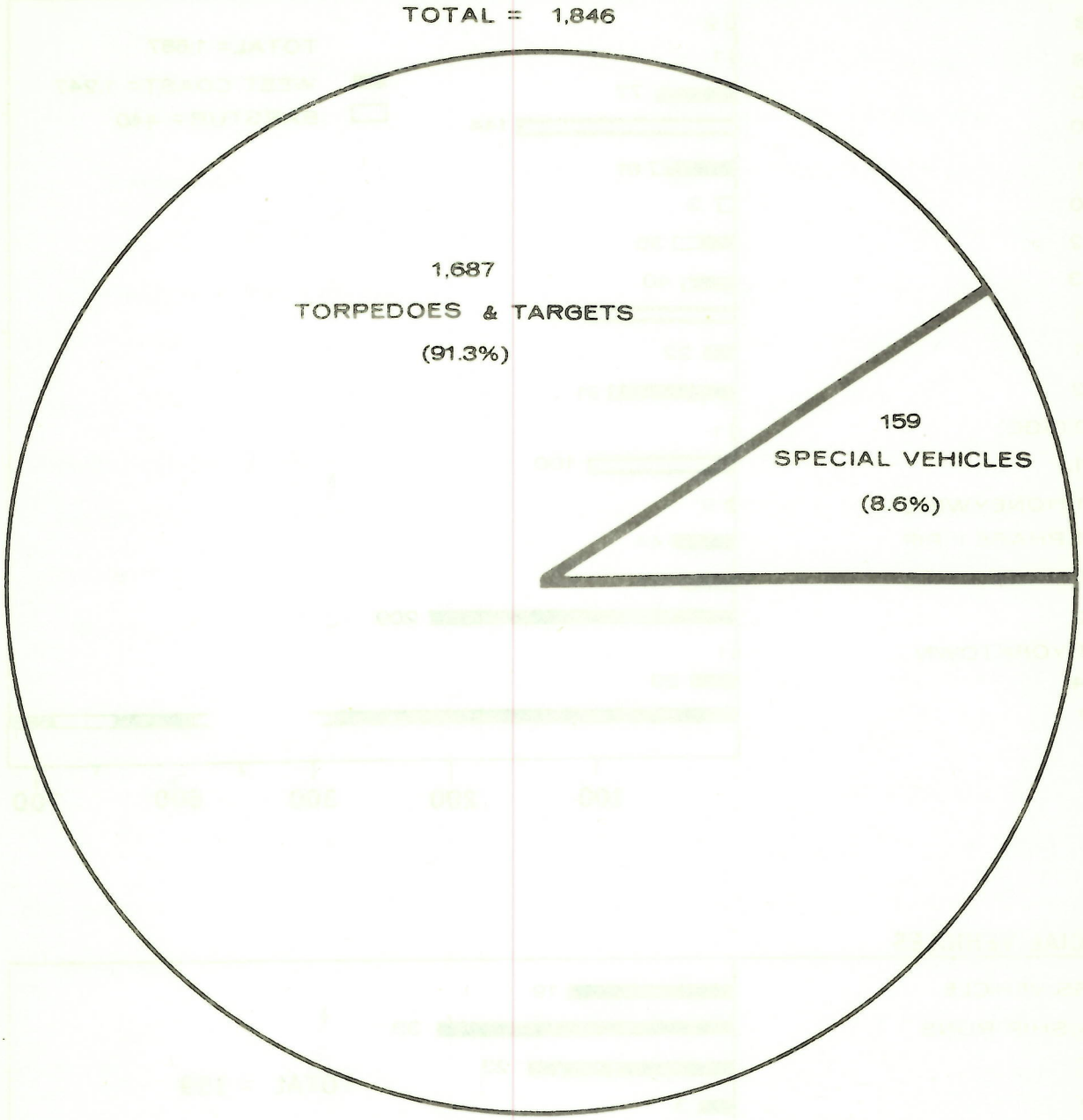
NAVTORPSTA for the third consecutive year served as a host for engineers recruited for the NAVSEASYSCOM Weapons Systems Management Development Program. A total of 15 engineers enrolled in this program that provides training toward future NAVSEASYSCOM assignments relating to ASW Weapons Systems.

To further employee relations, the Commanding Officer of NTS Keyport, Captain Carter, established an open channel for all employees to respond to him about any Station-related problem. This channel is provided by an employee submitting a problem through a "Let's Talk About It" column in the Station semi-monthly periodical entitled Keynotes. The column is arranged in a question-and-answer format.

A savings of $1,369,000 resulted through validation of 51 studies for the NAVTORPSTA Value Engineering/Cost Reduction Program. This is 137 percent of the $1,000,000 goal.

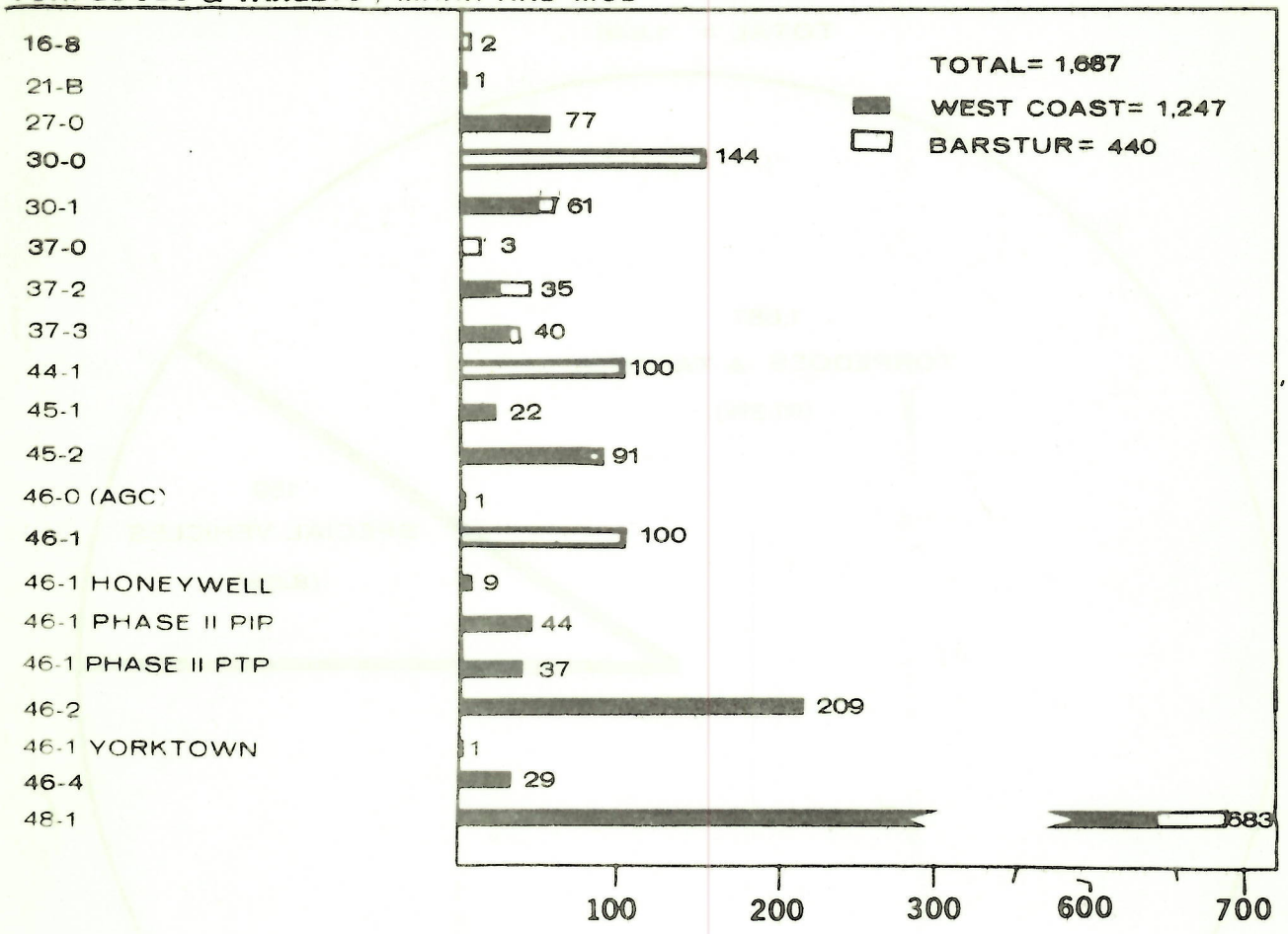
The beneficial suggestion program paid off for NTS Keyport in tangible savings of $276,439. as a result of 51 suggestions in FY-74. Employee cash awards based on tangible benefits totaled $10,485.

1974 RANGE RUNS



1974 RANGING

TORPEDOES & TARGETS , MARK AND MOD



SPECIAL VEHICLES