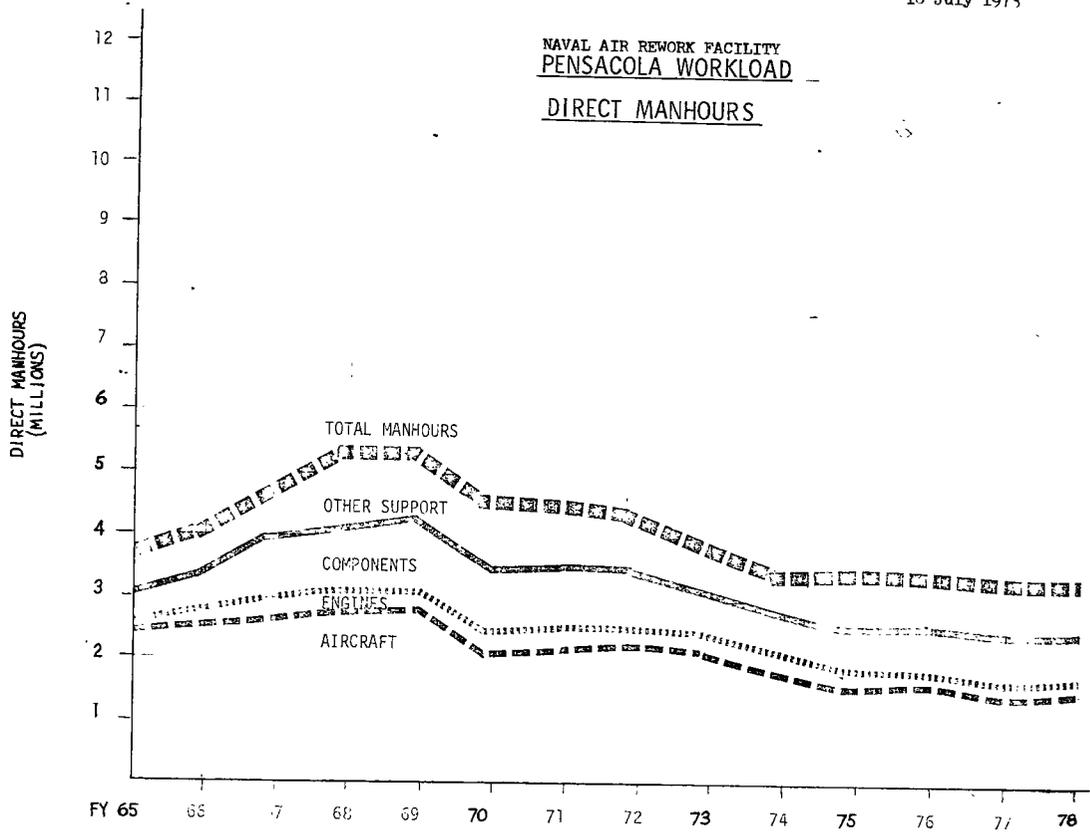


10 July 1973



Mr. PATTEN. What overall utilization of your NARF's have you experienced in the past and what are you projecting?

Mr. MURPHY. Mr. Chairman, the overall utilization based on the 40-hour week and direct man-hours run 89 percent in 1972, 86 percent in 1973, 85 percent is our projection for 1974, and then reflecting the consolidation to six NARF's from seven, we expect to go up to 86 percent in 1975 and 88 percent in 1976.

#### FISCAL YEAR 1974 MODERNIZATION REQUEST

Mr. PATTEN. What is the total amount included for NARF modernization in fiscal year 1974 program?

Admiral MARSCHALL. \$11,385,000, sir.

Mr. PATTEN. Provide for the record a breakout of the fiscal year 1974 construction and equipment modernization investments.

[The information follows:]

The fiscal year 1974 military construction program at NARF activities is as follows:

NARF Jacksonville, aircraft final finish facility-----	\$6,925,000
NARF Jacksonville, utilities-----	2,297,000
NARF North Island, hanger addition-----	754,000
NARF Alameda; avionics environmental control-----	1,409,000
<b>Total</b> -----	<b>11,385,000</b>

The fiscal year 1974 industrial plant equipment portion of the Navairworkforce modernization program is as follows:

NARF Alameda-----	\$3,550,000
NARF North Island-----	4,000,000
NARF Cherry Point-----	1,500,000
NARF Norfolk-----	2,750,000
NARF Jacksonville-----	1,800,000
NARF Pensacola-----	2,400,000
<b>Total</b> -----	<b>16,000,000</b>

#### DEFICIT

Mr. PATTEN. What overall amount do you anticipate spending for the next 5 years for construction and for equipment?

Admiral MARSCHALL. We are uncertain at this time, Mr. Chairman, because base closure items have caused realignment of our priorities.

We have, over the next several years, a hard requirement I would say for about \$140 million in these NARF items.

My feeling is that we will not be able to get back into the NARF program as heavily as we would like until about the 1976 program as a result of these base realignments and other urgent priorities.

Mr. PATTEN. Then what deficit will remain if you spend the \$140 million?

Admiral MARSCHALL. Well, there would be another deficit of roughly \$100 million of items that are not as urgent as the basic \$140 million of which I speak now.

In other words, we think there is about a \$240 million deficit of which the first \$140 million is considerably more urgent.

## OVERALL SAVINGS

Mr. PATTEN. What overall saving do you anticipate from NARF modernization in the fiscal year 1974 program?

Mr. MURPHY. I have to provide the aggregate for the record, but we do have economic payback benefits from three out of the four NARF projects this year, Mr. Chairman.

Mr. PATTEN. Can you provide that for each of the future year programs?

[The information follows:]

Three of the proposed fiscal year 1973 NARF Milcon projects result in economic payback benefits. Details on benefits from two of the three appear in the hearings record. They are:

NARF Jacksonville, aircraft final finish.

NARF Alameda, avionics environmental control.

## NARF JACKSONVILLE—AIRCRAFT FINAL FINISH

Payback benefits for each project are summarized as follows:

Economic analysis present value of the net investment as \$5,507,163. Present value of savings is \$6,927,306. A payback period of 14 years is thus realized.

Other nonquantified consideration is that the facility will increase the availability of aircraft by cutting down on the number of days the aircraft will be undergoing rework at the NARF. An estimated savings in time for each A-5 of 2 days and 1½ days for each A-7 will be realized. Some 13 A-5's and 125 A-7's are reworked each year at Jacksonville.

## NARF ALAMEDA—AVIONICS BUILDING ENVIRONMENTAL CONTROL

The principal savings are derived from expansion of the existing small instrument shop, resulting in the reduction of the rework time norm and the elimination of overtime from multiple-shift use of this highly specialized shop.

Installation of environmental control will permit expansion of the crowded shop, reducing overtime and lowering the rework norm from 14.5 to 13.5 man-hours per unit.

Annual savings: 12,250 units per quarter times 4 quarters per year times 1 hour per unit times \$14.55 per hour equals \$713,000.

The increased annual operating costs for electrical power to drive the air-conditioning equipment is offset by reduced maintenance costs in dust control and building maintenance.

The investment of \$1.4 million is thus paid back after approximately 3 years of use of the new environmental control features. This would occur 5 years after construction is started.

## NARF NORTH ISLAND—HANGAR ADDITION

Economic analysis shows present value of the net investment is \$650,112. Present value of benefits is \$2,212,508. Payback period of just over 3 years is realized. Savings accrue from reduced personnel costs when rework cycle is performed indoors in a hangar, and from the saving of 2½ days rework time on each of the 24 aircraft reworked each year.

## NARF PAYBACK CONSIDERATIONS

A study of the entire backlog of naval air rework facility military construction projects as to the estimated construction cost and, when applicable, the savings expected to result over the life of the project, has been made.

The study shows that if the entire backlog were theoretically accomplished immediately, the payback period would be 5.23 years.

Of course, the real world considerations, in which all segments of the Navy must compete for shares of limited annual Milcon resources, prevents accomplishing the modernization goal in a short time span.

Mr. MURPHY. The entire NARF modernization concept from the outset told us that if we could somehow achieve the whole modernization immediately, we would gain overall about a 5-year payback consideration. I think that applies to the whole as well as to the individual programs that we firm up.

Mr. DAVIS. You are talking about six remaining NARF's?

Mr. MURPHY. Seven down to six; yes, sir.

Admiral MARSCHALL. Yes, sir.

Off the record.

[Discussion off the record.]

Mr. MURPHY. With regard to the previous question with regard to equipment that we procured from other appropriations, we anticipate a level of \$16 million per year of that procurement to complement our NARF construction program.

#### WORK DONE IN-HOUSE

Mr. PATTEN. What percentage of its total air rework workload does the Navy presently do in-house?

Mr. MURPHY. This breaks down roughly 70 percent Navy, 28 percent commercial, and 2 percent other services.

Mr. PATTEN. What are you projecting?

Mr. MURPHY. We are projecting approximately those ratios, that same ratio, 70 percent to 30 percent.

Mr. PATTEN. Provide similar figures for the record based upon your mission-essential workload.

Mr. MURPHY. Yes, sir.

[The information follows:]

Approximately 82 percent of the mission-essential workload is performed in-house by the Navy with 18 percent performed by other services or contracted.

#### OVERHAUL OF SHIP GAS TURBINE ENGINES

Mr. PATTEN. What effect will the overhaul of ship gas turbine engines have on your utilization and your capacity to meet engine workload peaks?

Mr. MURPHY. As I mentioned earlier, we are assigning the J-79 jet engine workload to North Island, Calif. This is the largest jet engine we work on at the moment. We are centering the entire capability at North Island. We feel it is in a logical followon to assign to NARF North Island the ship turbines, the LM-2500 and LM-1500 engines. We have a firm plan to assign that workload to North Island.

#### TEST CELL POLLUTION ABATEMENT

Mr. PATTEN. What success has the Navy had in its engine test cell pollution abatement research?

Admiral MARSCHALL. Sir, the sound reduction program being pursued by the Navy will only reduce jet noise, engine noise, to an acceptable level while the engine is being tested in either an engine test cell or when the engine is installed in the aircraft and is being tested on a run-up pad. NASA will continue research for quieting the engines themselves. Of course we maintain close liaison with them.

The last of the Navy's jet engine test cells for outer frame testing was authorized and funded by the 1973 MCON program at NARF-Jacksonville for \$6.950 million.

The 1974 MCON program does not include any test cells, sound suppressors, or acoustical enclosures. Fiscal year 1973 and 1974 PAMN funds are being used to construct several portable enclosures. Basically, what we found in these so-called hush houses is that we have only so far theoretical success.

We think we are going to be successful, but the work is just now under way and we do not have any experience to show at the present time for the method that we are using.

Mr. PATTEN. What is it expected to cost in the long run?

Admiral MARSCHALL. Over the next several years, Mr. Chairman, funding requirements for abatement of noise from aircraft runup and engine test facilities are projected as follows:

Fiscal year 1975, \$17.250 million; fiscal year 1976, \$19.345 million; fiscal year 1977, \$18.225 million; fiscal year 1978, \$14.615 million; fiscal year 1979, \$12.190 million; for a total of \$81.625 million.

#### NOISE ABATEMENT

Mr. PATTEN. Admiral, besides NASA and yourself, who else is spending money in this field? Is private industry?

That is where we get the complaints. Our complaints are enormous. I will bet I had 10 releases on noise abatement in New York. In fact, all the Congressmen had weekend releases on account of Kennedy and Newark Airfields.

Admiral MARSCHALL. This whole environmental picture has been evolving over the years. As we go farther on, noise pollution is becoming more and more a factor in the overall picture.

I think probably the next year or 2 years will show that all the commercial people are going to be in the same boat with us. I think we are probably leading the way a little bit, but sooner or later we are going to have these noise abatement facilities in industry as well as in Government.

I think everybody has to get on the bandwagon. It is a rather staggering figure over 5 years, \$81.6 million. But it is with us and here to stay.

Mr. PATTEN. Are there any questions?

Mr. DAVIS. No.

Mr. McEWEN. No.

#### FACILITIES COSTS OF RELOCATIONS

Mr. NICHOLAS. You replied before that although there were not any specific projects which you could identify now as a result of transferring this workload from Quonset to the NARF at Norfolk, there might be some additional requirements in the future. If there are, then these would be naturally charged against the cost of the relocation?

Admiral MARSCHALL. No, sir.

Mr. NICHOLAS. If they are due to the workload which is shifting in, they should be charged to the relocation.

Mr. MURPHY. Certainly the cost of the relocation, the physical move of the special equipment that they use in this work, would be included. The space being available at Norfolk to accommodate them, we accept that as a no-cost item and move them in.

Now I am saying over the years at Norfolk we will probably have a modernization project in this building, overall, since many of those buildings need upgrading. At that point we feel it would not be a cost chargeable to the present move.

Mr. NICHOLAS. The position you are taking is that there is space available to do this work at North Island now and—

Admiral MARSCHALL. Are you saying North Island or Norfolk?

Mr. NICHOLAS. I am sorry, Norfolk, but the same would apply at North Island. Eventually, as part of your modernization program in the out-years you may come along and wish to modernize your operations, but that type of modernization, which is not presently programmed, is similar perhaps to a project which you might have included for modernization at the NAF which has been closed.

Admiral MARSCHALL. No. As I mentioned to Mr. Davis, we are reducing the overall backlog of modernization requirements in MILCON by \$40 million as a result of the closure of NARF-Quonset Point.

My feeling is that any modernization required at these other places will be incidental to the normal upgrade that we would expect at those particular remaining six NARF's.

Mr. NICHOLAS. But you have not, in making your statistics as to the savings, given yourself credit for the projects which you will avoid at Quonset Point nor have you taken into account projects which will be required at the other gaining locations?

We are talking now of the modernization program.

Admiral MARSCHALL. I am talking about modernization, too.

Mr. NICHOLAS. Could you provide, on this question of the NARF modernization, the projects which you did take into account in your cost savings?

Admiral MARSCHALL. We will be happy to provide that for the record.

[The information follows:]

The following NARF Quonset Point Milcon projects were considered cost avoidances in the base realignment analysis:

Fiscal year 1973, Engineering and Systems Analysis Addition-----	\$1, 460, 000
Fiscal year 1974, S-3A Environmental Control-----	752, 000

The entire unprogramed backlog of Milcon deficiencies at NARF Quonset Point, totaling \$40.8 million, was also deleted from the Navy's program objectives. However, this deletion was not considered in the realignment cost analysis.

NAVAL STATION, NORFOLK, VA.

Mr. PATTEN. Turn to the Naval Station, Norfolk.  
Insert page 62 in the record.

[The page follows:]

1. DATE 17 APR 1973		2. DEPARTMENT NAVY		3. FY 1974 MILITARY CONSTRUCTION PROGRAM			5. INSTALLATION NAVAL STATION					
4. COMMAND OR MANAGEMENT BUREAU COMMANDER IN CHIEF, ATLANTIC FLEET				6. INSTALLATION CONTROL NUMBER 6029-576		6. STATE/COUNTRY NORFOLK, VIRGINIA						
7. STATUS ACTIVE				8. YEAR OF INITIAL OCCUPANCY 1917		9. COUNTY (U.S.) INDEPENDENT CITY		10. NEAREST CITY WITHIN CITY				
11. MISSION OR MAJOR FUNCTIONS Provide, as appropriate, logistic support for the Operating Forces of the Navy, and for dependent activities and other commands as assigned. Major Activities Supported: Ships and Staff Homeported at NAVSTA Norfolk Headquarters, Fifth Naval District Naval Schools Command Naval Degaussing Station Naval Ship Engineering Center, Norfolk Fleet Branch Post Office Navy Publication and Printing Service Navy Commissary Store Correction Center												
12. PERSONNEL STRENGTH				PERMANENT			STUDENTS			TOTAL (9)		
				OFFICER (1)	ENLISTED (2)	CIVILIAN (3)	OFFICER (4)	ENLISTED (5)	OFFICER (6)		ENLISTED (7)	CIVILIAN (8)
a. AS OF 31 December 72				3,067	39,469	9,768	120	1,044	236	2,383	0	56,087
b. PLANNED (2nd FY 77)				3,180	49,137	9,768	120	1,444	236	2,383	0	66,268
13. INVENTORY												
LAND		ACRES (1)		LAND COST (\$000) (2)		IMPROVEMENT (\$000) (3)		TOTAL (\$000) (4)				
a. OWNED		1,091		1,854		59,263		61,117				
b. LEASED AND EASEMENTS		50* - 0#		14* - 0#		9,705* - 0#		9,705				
c. INVENTORY TOTAL (Except land rent) AS OF 30 JUNE 19 72												
d. AUTHORIZATION NOT YET IN INVENTORY												
e. AUTHORIZATION REQUESTED IN THIS PROGRAM												
f. ESTIMATED AUTHORIZATION - NEXT 4 YEARS												
g. GRAND TOTAL (c + d + e + f)												
14. SUMMARY OF INSTALLATION PROJECTS												
CATEGORY CODE NO. a	PROJECT DESIGNATION			TENANT COMMAND PRIORITY d	UNIT OF MEASURE e	AUTHORIZATION PROGRAM		FUNDING PROGRAM				
	PROJECT TITLE b					SCOPE f	ESTIMATED COST (\$000) g	SCOPE h	ESTIMATED COST (\$000) i			
151.20	BERTHING PIER			/	FB	2,800	9,624	2,800	9,624			
159.40	RELOCATE FLEET LANDING			/	LS	-	803	-	803			
165.10	PIER 2 DREDGING			/	CY	151,000	314	151,000	314			
723.10	ENLISTED MEN'S DINING FACILITY MODERNIZATION			24	SF	30,300	1,435	30,300	1,435			
812.90	PIER UTILITIES			/	LS	-	2,057	-	2,057			
852.10	VEHICLE PARKING AREA			/	SY	52,500	310	52,500	310			
171.20	FLEET SONAR SCHOOL (CNT) APPLIED INSTRUCTION BUILDING			/	SF	74,500	3,950	74,500	3,950			
						TOTAL	18,493		18,493			

DD FORM 1390  
1 OCT 70

1/ INCLUDES \$1,977,000 FOR POLLUTION ABATEMENT

Page No. 18,493

I-62

405

Naval Station, Norfolk, VA., \$18,493,000

This station provides logistic support for 25 or more Naval Commands, including Fifth Naval District Headquarters; Commander, Cruiser-Destroyer Force and the Commander, Submarine Force, U.S. Atlantic Fleet. The station currently serves as homeport for 80 ships of the Atlantic Fleet and as a part of the shore establishment reduction and realignment will have another 20 ships assigned.

The berthing pier project will provide a pier with "cold iron" utilities to accommodate large Fleet ships which cannot presently be berthed because of a shortage of berthing space.

The relocate fleet landing project will free Pier 2 berthing space and provide a more sheltered basin for fleet landing facilities.

The Pier 2 dredging project will lower the water depth along the inboard berth of the southside of Pier 2 from 20 to 35 feet and provide an additional 800 feet of berthing for large modern vessels.

The applied instruction building project will provide instructional and administrative space for the Fleet Sonar School to be relocated from Key West, Florida.

The enlisted men's dining facility project will modernize the existing main mess hall to feed 1958 men per meal and consolidate into approximately 1/3 of the present area thereby making 55,000 sq. of space available for other uses.

The pier utilities project will provide "cold iron" utilities to the nuclear submarine pier.

The vehicle parking area project will install paving, drainage, sidewalks and lighting for parking at the destroyer-submarine berthing area. The additional ships to be homeported at this installation will greatly increase the requirement for parking areas.

Status of funds:

Cumulative appropriations through fiscal year 1973	\$55,341,000
Cumulative obligations, Dec 31, 1972 (actual)	33,178,442
Cumulative obligations, June 30, 1973 (estimated)	41,931,825

DESIGN INFORMATION

Project	Design cost	Percent complete April 1, 1973
Berthing pier	\$100,000	2
Relocate fleet landing	38,544	2
Pier 2 dredging	15,070	2
Applied instruction building	189,600	0
Enlisted men's dining facility modernization	58,340	21
Pier utilities	82,855	8
Vehicle parking area	14,880	50

## RELOCATIONS

Mr. PATTEN. What functions are being relocated to this naval station?

Captain WATSON. We have 18 ships relocated from Newport to Norfolk. The fleet sonar school from Key West will be relocated to the naval station at Norfolk.

Along with the ships, the Commander Cruiser Destroyer Force and the fleet training center from Newport will be relocated also.

Mr. PATTEN. Which of the facilities requested here are required as a result of the shore establishment realignments?

Captain WATSON. Mr. Chairman, the relocation of the fleet landing, the dredging of pier 2, the applied instruction building, and the vehicle parking area are the four projects that are required at the naval station for the relocation.

## EFFECT OF RELOCATIONS ON HOUSING REQUIREMENTS

Mr. PATTEN. What is the present bachelor housing deficit at the naval station, Norfolk?

Provide for the record the present and projected bachelor housing situation.

Admiral MARSCHALL. Yes, sir.  
[The information follows:]

Naval station, Norfolk has a present requirement for 6,106 barrack spaces, 3,306 adequate assets and a current effective deficit of 2,800 adequate barrack spaces. It is estimated that by fiscal year 1977 the projected requirements, including 518 enlisted men as a result of the relocation of naval activities, will increase to approximately 7,014 barrack spaces. The effective deficit will therefore increase from 2,800 adequate spaces to approximately 3,708 spaces.

Mr. PATTEN. Also provide for the record detailed information on the numbers of personnel who will be transferred here and their housing requirements.

[The information follows:]

Current projects indicate 496 officer and 8,006 enlisted personnel moving into the naval station, Norfolk area. Those bachelor enlisted personnel not living aboard ship will be housed by a BEQ modernization project tentatively scheduled for fiscal year 1975. It is anticipated that sufficient space will be available to absorb those few bachelor officers not living aboard ship.

The requirement for increased family housing resulting from the above increased loading will be approximately 4,500 units. The Navy family housing situation which showed a slight surplus prior to the realignment will now change to a deficit of 2,793 units. It is anticipated that future community development will reduce this deficit.

Mr. PATTEN. Do you not plan any additional bachelor enlisted quarters construction at naval station, Norfolk?

Admiral MARSCHALL. Yes, sir.

In 1975 we anticipate requesting a 500-man BEQ at Norfolk Naval Station.

Mr. PATTEN. Were you overbuilt in permanent bachelor quarters here?

Admiral MARSCHALL. No, Sir. I think there is an existing deficiency that will probably continue.

Mr. PATTEN. Does the Navy have plans to request additional family housing in the Norfolk area in fiscal year 1974?

Admiral MARSCHALL. Yes, sir. We do not have anything listed for them right now.

## OUT-YEAR PROJECTS

Mr. PATTEN. What are the major projects which comprise the \$36,119,000 which you plan to request here in the next 4 years?

Admiral MARSCHALL. We have a berthing pier No. 2, \$9.175 million, in fiscal 1975; we have several smaller projects which bring the 1976 total and 1975 up to about \$7 million.

Then in 1977 we have a deperming facility for \$1.251 million, and a small craft berthing improvement for \$570,000, an officers mess, closed, \$719,000, all in the 1977 program; road improvements and vehicle parking areas coming up to a total of \$3.191 million for 1977.

We anticipate some cold iron projects which have not been listed in our requirements.

Mr. PATTEN. Will you provide details for the record?

Admiral MARSCHALL. Yes, sir.

[The information follows:]

<i>Project</i>	<i>Cost (thousands)</i>
Fiscal year 1975:	
Norfolk and Western Pier No. 2 (cold iron)-----	\$9, 175
Fleet Staff operations building (SER)-----	1, 214
Bachelor enlisted quarters (SER)-----	2, 680
Dredge piers (cold iron)-----	800
Dredge piers 22/23 (cold iron)-----	957
Electrical utilities piers (cold iron)-----	2, 999
Fiscal years 1976-78:	
Deperming facility-----	1, 251
Small craft berthing-----	570
Officers' mess closed-----	719
Road improvements-----	858
Vehicle secured parking area-----	305
Pier 20 extension (cold iron)-----	2, 514
Bachelor enlisted quarters-----	3, 100
Decatur Avenue extension-----	357
Total—NAVSTA Norfolk-----	27, 499
Other projects included in the "next 4 years" projection for Naval Station, Norfolk, but actually pollution projects under the cognizance of the Naval Supply Center, Norfolk, are:	
1975—POL pipeline, Craney Island-----	\$5, 020
Oil waste collection-----	3, 600
Total -----	8, 620

The grand total for above is \$36,119.

## PROJECTS REQUIRED AS RESULT OF RELOCATIONS

Mr. PATTEN. Which of the outyear projects will be required as a result of the Shore Establishment realignments announced to date?

Admiral MARSCHALL. We have only two that we know of, Mr. Chairman, the 1975 program for the fleet staff operations building and the BEQ modernization.

## COSTS OF RELOCATIONS

Mr. PATTEN. What are the estimated costs and savings involved in relocating activities here from Key West and from Newport?

Admiral MARSCHALL. We would have to provide that for the record,

Mr. Chairman, because our figures show what we saved by moving from Newport, but not to what activity.

I think we can calculate and provide it for the record.

For example, from the estimated annual savings moving from Newport, we have \$18.385 million, with a one-time closure cost of \$8.224 million.

We can provide the figures for the record.

[The information follows:]

#### Costs

The following cost data includes all closure costs associated with the relocation of functions from Key West and Newport to Norfolk. These costs include: relocation expenses, severance pay, relocation and preservation of equipment and all MCON requirements:

1. Key West to Norfolk.....	\$12,354,000
2. Newport to Norfolk.....	4,328,000

#### SAVINGS

The savings realized from the Shore Establishment realignment actions pertain directly to the activity being closed and cannot be realistically apportioned to the activities receiving the ships and units being relocated. The total estimated annual savings resulting from the disestablishment of NS Key West, Fla., are \$7,507,000. Units from NS Key West are being relocated to Norfolk, San Diego and Charleston. The total estimated annual savings resulting from the realignment actions at the Naval Complex, Newport, R.I., are \$18,385,000. Units from NS Newport are being relocated to Norfolk, Charleston, and Mayport.

#### STATUS OF LAND ACQUISITION

Mr. PATTEN. What is the status of the acquisition of the property of the Norfolk & Western Railway?

Mr. MARKON. We have entered into an agreement with the Norfolk & Western Railway in September of last year. The purchase price for the Norfolk & Western property was \$17.4 million. This compares with our authorization and appropriation of \$18.45 million.

Mr. PATTEN. Good thing the railroads need the money, right?

I think we started out at \$35 million, did we not?

Mr. MARKON. There were various figures. When we originally came to Congress we had a project of \$20 million, which was then reduced to \$12.7 million. We were told to negotiate a satisfactory figure with the railroad and the project. It was finally authorized at \$18.45 million.

Mr. PATTEN. Would you say there is a saving of \$7.3 million?

Mr. MARKON. No, sir, I would say we negotiated a very good agreement with the railroad.

Mr. PATTEN. In other words, we are not going to get \$6 million back? We appropriated \$18.5 million.

Admiral MARSCHALL. That included the administrative costs as well. We are talking about the final deal with the railroad.

Mr. DAVIS. Is this something in the current year program?

Mr. NICHOLAS. This was 1972?

Admiral MARSCHALL. 1972.

Mr. DAVIS. Does that show on the map that we have up there?

Mr. PATTEN. We had a better map than that to show it.

Mr. MARKON. I have a photograph. Here are the old coal piers. They show very well on the photos.

Mr. PATTEN. I saw them.

Captain WATSON. The one on the left is the pier project in this program.

Mr. PATTEN. How much did we get of what we see here?

Mr. MARKON. Everything in the red outline.

Mr. PATTEN. Is that right? Maybe you got a good price.

Mr. MARKON. That includes the entire classification yard and the two substructures for the piers out in the bay.

Mr. DAVIS. How much land are we talking about, 509 acres?

Mr. PATTEN. What is the cost per acre?

Mr. MARKON. That cost included the value to the railroad of the use of the classification yard in their overseas shipment of coal.

Mr. PATTEN. Well, there are a number of reasons why we should adjourn now until tomorrow morning at 10 o'clock, with the schedules that we have. Is that agreeable to you?

Mr. DAVIS. Yes; I think Mr. McEwen and I believe we should start off with a briefing on this land acquisition because it is something we know nothing about.

Mr. PATTEN. Very well.

---

TUESDAY, JULY 10, 1973.

## MARINE CORPS FACILITIES

Mr. SIKES. We are ready to begin discussion of the requirements for military construction of the Marine Corps for fiscal year 1974.

### SUMMARY OF FISCAL YEAR 1974 REQUEST

Insert pages II-29 through II-33 in the record.

[The pages follow:]

DEPARTMENT OF THE NAVY  
MILITARY CONSTRUCTION PROGRAM - FY 1974  
(ALL DOLLARS THOUSANDS)

<u>Installation and Project</u>	<u>Authorization</u>		<u>Appropriation</u>	
	<u>Project Amount</u>	<u>Installation Total</u>	<u>Project Amount</u>	<u>Installation Total</u>
<u>MARINE CORPS</u>				
<u>NAVAL DISTRICT WASHINGTON, D.C.</u>				
<u>State of Virginia</u>				
<u>Marine Corps Air Station, Quantico (MARCORPA)</u>				
P-119 Helicopter Maintenance Hangar (211.05 - 20,100 SF)	831		831	
		<u>831</u>		<u>831</u>
<u>Marine Corps Development and Education Command, Quantico (MARCORPG)</u>				
P-059 Enlisted Men's Dining Facility (723.10 - 22,400 SF)	1,541		1,541	
		<u>1,541</u>		<u>1,541</u>
TOTAL - NAVAL DISTRICT WASHINGTON, D.C.		<u><u>2,372</u></u>		<u><u>2,372</u></u>
<u>FIFTH NAVAL DISTRICT</u>				
<u>State of North Carolina</u>				
<u>Marine Corps Base, Camp Lejeune (MARCORPG)</u>				
P-162 Parachute and Survival Equipment Shop-Force Troops Complex (211. 34 - 11,200 SF)			555	
<u>Hadnot Point</u>				
P-210 Bachelor Enlisted Quarters(722.11-1,260 MN,207,620 SF)	7,168		7,168	
P-160 Central Heating Plant Expansion(821.22 - 100,000 BH)	1,179		1,179	
		<u>8,902</u>		<u>8,902</u>

DEPARTMENT OF THE NAVY  
MILITARY CONSTRUCTION PROGRAM - FY 1974  
(ALL DOLLARS THOUSANDS)

<u>Installation and Project</u>	Authorization		Appropriation	
	Project Amount	Installation Total	Project Amount	Installation Total
<u>MARINE CORPS</u>				
<u>FIFTH NAVAL DISTRICT</u>				
<u>State of North Carolina (Cont'd)</u>				
<u>Marine Corps Air Station, Cherry Point (MARCORPA)</u>				
P-716 Steam Plant Improvements (821.22 - LS)	1,821	<u>1,821</u>	1,821	<u>1,821</u>
<u>Marine Corps Air Station, (H) New River (MARCORPA)</u>				
P-200 Avionics Shop (211.37 - 7147 SF)	470	<u>470</u>	470	<u>470</u>
P-180 Utilities Expansion (821.22-LS)	2,775	<u>2,775</u>	2,775	<u>2,775</u>
		3,245		3,245
<u>State of Virginia</u>				
<u>Fleet Marine Force, Atlantic, Norfolk (MARCORPG)</u>				
<u>Camp Elmore</u>				
P-603 Enlisted Men's Dining Facility (723.10 - 4,840 SF)	374	<u>374</u>	374	<u>374</u>
P-611 Road Improvements (851.10 - 17,000 SY)	312	<u>312</u>	312	<u>312</u>
		686		686
TOTAL - FIFTH NAVAL DISTRICT		<u>14,654</u>		<u>14,654</u>
<u>SIXTH NAVAL DISTRICT</u>				
<u>State of Georgia</u>				
<u>Marine Corps Supply Center, Albany (MARCORPG)</u>				
P-900 Administration Building (610.10 - 172,700 SF)	5,204	<u>5,204</u>	5,204	<u>5,204</u>

DEPARTMENT OF THE NAVY  
MILITARY CONSTRUCTION PROGRAM - FY 1974  
(ALL DOLLARS THOUSANDS)

<u>Installation and Project</u>	<u>Authorization</u>		<u>Appropriation</u>	
	<u>Project</u> <u>Amount</u>	<u>Installation</u> <u>Total</u>	<u>Project</u> <u>Amount</u>	<u>Installation</u> <u>Total</u>
<u>SIXTH NAVAL DISTRICT (Cont'd)</u>				
<u>State of South Carolina</u>				
<u>Marine Corps Air Station, Beaufort (MARCORPA)</u>				
P-223 Aircraft Corrosion Control Facility (116.15- 2 EA)	126	<u>126</u>	126	<u>126</u>
<u>Marine Corps Recruit Depot, Parris Island (MARCORPG)</u>				
P-037 Bachelor Enlisted Quarters (722.11-576 MN) (90,432 SF)	2,580	<u>2,580</u>	2,580	<u>2,580</u>
		<u>7,910</u>		
TOTAL - SIXTH NAVAL DISTRICT			<u>7,910</u>	<u>7,910</u>
<u>ELEVENTH NAVAL DISTRICT</u>				
<u>State of Arizona</u>				
<u>Marine Corps Air Station, Yuma (MARCORPA)</u>				
P-022 Commissary (740.23--26,200 SF)	999		999	
P-178 Land Acquisition (911.10-129 AC)	635		635	
P-187 Land Acquisition (Aviation Installation Compatible Use Zone) (921.10 - 14,000 AC Easement) (By Exchange)	3,156		-	
		<u>4,790</u>		
			<u>1,634</u>	
<u>State of California</u>				
<u>Marine Corps Supply Center, Barstow (MARCORPG)</u>				
P-016 Automotive Vehicle Shops (214.20 - 22,820 SF)	976		976	
P-074 Heating Plant and Distribution System (821.22-75,000 BH)	2,826		2,826	
		<u>3,802</u>		
			<u>3,802</u>	

DEPARTMENT OF THE NAVY  
MILITARY CONSTRUCTION PROGRAM - FY 1974  
(ALL DOLLARS THOUSANDS)

<u>Installation and Project</u>	<u>Authorization</u>		<u>Appropriation</u>	
	<u>Project Amount</u>	<u>Installation Total</u>	<u>Project Amount</u>	<u>Installation Total</u>
<u>MARINE CORPS</u>				
<u>ELEVENTH NAVAL DISTRICT</u>				
<u>State of California (Cont'd)</u>				
<u>Marine Corps Base, Camp Pendleton (MARCORPG)</u>				
<u>Basewide</u>				
P-491 Combat Training Ranges (179.50--LS)	544		544	
P-628 Area Lighting Systems (812.20--LS)	425		425	
<u>Chappo Area</u>				
P-132 Bachelor Enlisted Quarters (722.11-1110 MN) (179,270 SF)	6,285		6,285	
P-436 Mess Hall Modernization (723.10 - 25,541 SF)	704		704	
<u>Horno Area</u>				
P-461 Bachelor Enlisted Quarters (722.11-288 MN)(45,939 SF)	1,649		1,649	
P-194 Gymnasium (740.43 - 20,980 SF)	1,106		1,106	
<u>San Onofre</u>				
P-570 Telephone Cable (135.20 - LS)	99		99	
<u>Marine Corps Auxiliary Landing Field, Camp Pendleton (MARCORPA)</u>				
P-231 Approach Lighting (136.10-1, 500 Feet of Lighting)	108		108	
		10,920		10,920
<u>Marine Corps Air Station, El Toro (MARCORPA)</u>				
P-164 Col Storage and Ready Issue Warehouse (431.10-14,409 SF)	747		747	
		747		747

DEPARTMENT OF THE NAVY  
MILITARY CONSTRUCTION PROGRAM - FY 1974  
(ALL DOLLARS THOUSANDS)

	<u>Authorization</u>		<u>Appropriation</u>	
	<u>Project</u>	<u>Installation</u>	<u>Project</u>	<u>Installation</u>
	<u>Amount</u>	<u>Total</u>	<u>Amount</u>	<u>Total</u>
<u>MARINE CORPS</u>				
<u>ELEVENTH NAVAL DISTRICT (Cont'd)</u>				
<u>State of California (Cont'd)</u>				
<u>Marine Corps Recruit Depot, San Diego (MARCORPG)</u>				
P-034 Dispensary (550.10-54,200 SF)	3,825	<u>3,825</u>	3,825	<u>3,825</u>
<u>Marine Corps Base, Twentynine Palms (MARCORPG)</u>				
P-104 Applied Instruction Buildings (171.20 - 68,779 SF)	2,992	<u>2,992</u>	2,992	<u>2,992</u>
TOTAL - ELEVENTH NAVAL DISTRICT		<u>27,076</u>		<u>23,920</u>
<u>FOURTEENTH NAVAL DISTRICT</u>				
<u>State of Hawaii</u>				
<u>Marine Corps Air Station, Kaneohe Bay (MARCORPA)</u>				
P-100 Aircraft Hangar Improvements (211.06 - 74,880 SF)	485		485	
P-056 Bachelor Enlisted Quarters (722.11 - 756 MN) (124,492 SF)	5,130		5,130	
P-048 Connecting Road to Interstate Highway (851.10-17,000 SY)	373	<u>373</u>	373	<u>373</u>
		5,988		5,988
TOTAL - FOURTEENTH NAVAL DISTRICT		<u>5,988</u>		<u>5,988</u>
TOTAL - MARINE CORPS		<u>58,000</u>		<u>54,844</u>

## MARINE CORPS STRENGTH

Mr. SIKES. What is the present strength of the Marine Corps, and what is your long-range projected strength, General?

General JANNELL. As of 1 June, 1973, the strength of the Marine Corps was 194,976. Our current fiscal guidelines and plans point to a long-range projected strength of 196,415. Our facilities program is geared to this 196,415-man Marine Corps as well.

Mr. SIKES. That is your target strength?

General JANNELL. Yes, sir.

Mr. SIKES. What is the situation in the Marine Corps Reserve? How do they figure in this plan for military construction requirements?

General JANNELL. As of May 1, sir, we had 34,286 U.S. Marine Corps Reserves drawing reserve training pay. Of the total 182 U.S. Marine Corps Reserve activities, 42 are exclusive U.S. Marine Corps Reserve Training Centers.

Mr. SIKES. Are they adequately programed from a military construction standpoint?

General JANNELL. Yes, sir, they are.

## MARINE AIR

Mr. SIKES. Are you prepared to discuss the rationale which dictates the number of helicopters or fixed wing aircraft provided in support of Marine Corps amphibious elements?

General JANNELL. Yes, sir.

Marine aviation units are task organized to retain the spectrum of capability required for support of an amphibious force. This spectrum of capability includes mobility, fire power, logistics support, and command and control systems. An example would be a Marine amphibious unit (MAU), which is composed of a Marine infantry battalion augmented by selected force units which might include engineers, artillery, reconnaissance personnel, and supporting aircraft, both fixed wing and helicopter.

Mr. SIKES. Can you tell us now, and then provide details for the record, where your major air units of each type are located?

General JANNELL. Sir, the Marine Corps maintains two major air bases in the United States at Cherry Point, N.C., and El Toro, Calif., and a base at Iwakuni, Japan. These three air bases, along with six closely located satellite bases, house the three Marine air wings authorized. An additional air base at Kaneohe Bay supports a Marine brigade. Details of aircraft base loading will be provided for the record.

[The information follows:]

## MARINE CORPS AIRCRAFT BY LOCATION, BY TYPE, AND SQUADRON (ON-BOARD AS OF JULY 1, 1973)

	<i>East coast</i>
MCAS, Cherry Point (125) :	
VMFAT-----	24 F4J.
VMAT (AW)-----	13 A6A, 3 TC4C.
VMAT-----	10 A4M, 15, TA4J.
VMGR-----	12 KC-130.
VMCJ-----	7 RF4B, 9 EA6A.
VMA (AW)-----	12 A6A.
VMA (AW)-----	12 A6A.
VMA (AW)-----	12 A6A.
VMFA-----	12 F4B.
H. & M.S., SOES-----	5 TA4F, 5 C117, 2 T-28, 2 T-39, 2 HH-1K.
MCAS, Beaufort (129) :	
VMA-----	18 A4M.
VMA-----	18 AV8A.
VMA-----	19 A4M.
VMA-----	20 AV8A.
VMFA-----	14 F4J.
VMFA-----	12 F4J.
VMFA-----	15 F4J.
H. & M.S., SOMS-----	3 C117, 6 TA4F, 2 T-28, 2 HH-1K.
MCAS (H), New River (230) :	
HMT-----	10 CH-46F, 9 CH-53D.
HML-TE-----	6 UH-1N.
HMA-TE-----	4 AH-1J.
VMO-TE-----	3 OV-10A.
H. & M.S.-----	19 CH-46F, 9 CH-53D, 1 C117.
HMH-----	19 CH-53D.
HMM-----	10 CH-46F. 4 CH-53D, 2UH-1N, 4 AH-1J.
HMM-----	18 CH-46F.
HMM-----	18 CH-46F.
HMH-----	18 CH-53D.
HMA-----	23 AH-1J.
HML-----	18 UH-1N.
VMO-----	21 OV-10A.
HML-----	9 UH-1N.
Station-----	4 T-28, 1 U-11.
MCAS, Quantico (46) :	
HMM-----	19 CH-46F.
SOES-----	1 C117, 12 T-28.
HMX-----	3 SH-3, 6 CH46, 7 VH-3, 4 CH53, 3 UH1N. 3 VH-1N.
	<i>West coast</i>
MCAS, Yuma (48) :	
Station-----	1 C117, 1 F4B, 2 T-28, 3 HH-1K.
VMFAT-----	20 F4B.
VMAT-----	9 A4E, 16 TA4F/J.
VMA-----	12 A4E/F.
VA/VF deployed for gunnery training-----	Varies (maximum of 4 squadrons).
MCAS, El Toro (89) :	
VMFA-----	9 F4B.
VMFA-----	10 F4B.
VMFA-----	12 F4.
VMCJ-----	6 RF4B, 6 EA6A.
VMA-----	13 A4M.
VMA (AW)-----	8 A6A.
VMGR-----	12 KC-130.
Station-----	1 C131, 2 C117, 4 T-28, 3 HH-1K.
H. & M.S.-----	4 C117, 5 TA4F.

## MARINE CORPS AIRCRAFT BY LOCATION, BY TYPE, AND SQUADRON (ON-BOARD AS OF JULY 1, 1973)—Continued

*West coast*—Continued

MCALF, Camp Pendleton (57) :  
 HMA ----- 19 AH-1G.  
 HML ----- 18 UH-1E.  
 VMO ----- 20 OV-10.  
 MCAS (H), Santa Ana (93) :  
 HMT ----- 10 CH53, 11 CH46.  
 HMM ----- 21 CH46.  
 HMM ----- 21 CH46.  
 HMH ----- 14 CH53.  
 HMH ----- 16 CH53.

*Pacific area*<sup>1</sup>

MCAS, Kaneohe Bay [deleted] :  
 Station ----- [deleted] CH46, [deleted] T-28.  
 VMFA ----- [deleted] F4B.  
 VMFA ----- [deleted] F4J.  
 VMFA ----- [deleted] F4J.  
 HMM ----- [deleted] CH-46D.  
 HMH ----- [deleted] CH53A.  
 H. & M.S. ----- [deleted] TA4, [deleted] UH1E, [deleted]  
 OV10A, [deleted] AH1J, [deleted] C117.  
 MCAS, Iwakuni [deleted] :  
 Station ----- [deleted] C117, [deleted] US2A, [deleted]  
 CH46.  
 H. & M.S. ----- [deleted] TA4F, [deleted] C117.  
 VMCJ ----- [deleted] RF4B, [deleted] EA6A.  
 VMA ----- [deleted] A4E.  
 VMFA (deployed) ----- [deleted] F4B.  
 VMFA (deployed) ----- [deleted] A6A  
 VMA (AW) (deployed) ----- A4E.  
 VMA ----- [deleted] A6A.  
 MCAS (H), Futema [deleted] :  
 H. & M.S. ----- [deleted] C117.  
 HMM ----- [deleted] CH-46D.  
 HMM ----- [deleted] CH-46D.  
 VMO ----- [deleted] OV-10A.  
 HML ----- [deleted] UH-1E.  
 HMH ----- [deleted] CH-53D.  
 HMA ----- [deleted] AH-1J.  
 VMGR ----- [deleted] KC-130.  
 Station ----- [deleted] US2A.

<sup>1</sup> Classified aircraft strengths in the Pacific area have been deleted.

Mr. SIKES. Are all of the Marine Corps airbases being used to full or optimum capacity?

General JANNELL. They are all being used to optimum capacity. Our buildup in strength during Vietnam was basically placed into combat areas without an increase to the number of installations in the Marine Corps. Consequently, as we returned to our current strength we paralleled our reductions with troop and air unit withdrawals from the combat areas. Accordingly, we currently are maintaining our bases to optimum capacity. We are constantly studying, and will continuously evaluate, the effective utilization of all our bases. However, our present

aircraft loading at each of our air installations precludes any possibility of consolidation at this time, sir.

#### BASE CLOSURE IMPACT

Mr. SIKES. How were you affected by the recent base closure announcement?

General JANNELL. None of our bases are scheduled for closing. We do have one base, Philadelphia, the supply activity, which will be relocated to Albany, Ga.

Mr. SIKES. In view of the present strength and target strength, are you in a position to state that for the foreseeable future there is a requirement for all Marine bases?

General JANNELL. Yes, sir, there is.

Mr. SIKES. You see no likelihood or logic in further consolidation?

General JANNELL. No, sir.

#### MARINE CORPS USE OF F-14 AIRCRAFT

Mr. SIKES. If the Marine Corps procures F-14 aircraft, how many will it procure and where will they be stationed?

General JANNELL. As I understand, the present planning indicates procurement of 60 F-14 aircraft plus pipeline spares, starting in fiscal year 1975.

This would represent 5 squadrons of 12 aircraft each. Two will be stationed at Yuma, Ariz., and 3 at Beaufort, S.C.

General JANNELL. In fiscal year 1975, sir.

Mr. SIKES. When do you expect the F-14 to come into the Active Forces?

Mr. NICHOLAS. Could you provide a detailed schedule for each squadron for the record?

General JANNELL. Yes, sir.

[The information follows:]

#### F-14 SCHEDULE

Essentially the Marine Corps is to be allocated 25 percent of the aircraft procured under the F-14A program. We are programmed for 4 tactical squadrons and one training squadron for a total of 60 aircraft. We will share common pipeline and attrition aircraft with the Navy but could receive up to 86 aircraft depending on the total F-14's authorized. The first squadron will get aircraft in fiscal year 1975 and will be operational at Marine Corps Air Station, Yuma, Ariz. by December 1975. The second squadron will receive their aircraft during fiscal year 1976 and be operational at Marine Corps Air Station, Beaufort, S.C. by June 1976. The third squadron will receive their aircraft in fiscal year 1977 and will be operational at Marine Corps Air Station, Beaufort, S.C. by end of fiscal year 1977. These first three squadrons will receive their training at Naval Air Station, Miramar with Marine Corps augmentation provided and we will form our own F-14 training squadron at Marine Corps Air Station, Yuma, Ariz. by July 1977.

Mr. SIKES. Will the Marine Corps F-14's be in addition to existing F-4's, or will they replace F-4 units?

General JANNELL. Our present plans call for a one-to-one replacement of the F-4 units by the F-14.

Mr. SIKES. How do you plan to conduct simulated training for the crews and maintenance personnel?

General JANNELL. Sir, under the present plan initial training of three squadrons of air crews and ground personnel will be accomplished at NAS, Miramar in conjunction with the Navy. We may continue the use of Navy facilities for training, utilizing NAS, Oceana facilities on the east coast as they become available.

Mr. SIKES. Are there questions on the Marine Corps facilities?

Mr. DAVIS. Not at this time.

Mr. LONG. No, Mr. Chairman.

MARINE CORPS AIR STATION, QUANTICO, VA.

Mr. SIKES. We will place in the record page II-34.

[The page follows:]

1. DATE 19 FEB 1973		2. DEPARTMENT NAVY		3. INSTALLATION FY 1974 MILITARY CONSTRUCTION PROGRAM		4. STATE/COUNTRY MARINE CORPS AIR STATION						
4. COMMAND OR MANAGEMENT BUREAU MARINE CORPS			5. INSTALLATION CONTROL NUMBER 8139-800		6. STATE/COUNTRY QUANTICO, VIRGINIA							
7. STATUS ACTIVE		8. YEAR OF INITIAL OCCUPANCY 1917		9. COUNTY (U.S.) STAFFORD PRINCE WILLIAM		10. NEAREST CITY 25 MILES SOUTH TO FREDERICKSBURG						
11. MISSION OR MAJOR FUNCTIONS To maintain and operate facilities and provide services and materials to support the aviation requirements of the US Marine Corps Base, Quantico, Virginia, and to support operations of the following major activities and units designated by the Commandant of the Marine Corps: <u>Major Activities Supported:</u> Headquarters, Commanding Officer, MCAS Headquarters & Headquarters Squadron One Marine Helicopter Squadron One Station Operations and Engineering Squadron HMM Squadron (mission change) MATCU (mission change)				12. PERSONNEL STRENGTH				TOTAL (9)				
				PERMANENT			STUDENTS		SUPPORTED		TOTAL (9)	
				OFFICER (1)	ENLISTED (2)	CIVILIAN (3)	OFFICER (4)	ENLISTED (5)	OFFICER (6)	ENLISTED (7)		CIVILIAN (8)
A. AS OF 31 DEC 1972				83	899	79	0	0	3	0	18	1,082
B. PLANNED (END FY 1975)				89	695	79	30	92	45	178	22	1,230
13. INVENTORY												
LAND		ACRES (1)		LAND COST (\$000) (2)		IMPROVEMENT (\$000) (3)		TOTAL (\$000) (4)				
A. OWNED		310		774		7.135		7,869				
B. LEASES AND EASEMENTS		0		0		0		0				
C. INVENTORY TOTAL (Except land rent) AS OF 30 JUNE 1972								7,869				
D. AUTHORIZATION NOT YET IN INVENTORY								176				
E. AUTHORIZATION REQUESTED IN THIS PROGRAM								831				
F. ESTIMATED AUTHORIZATION - NEXT 4 YEARS								3,960				
G. GRAND TOTAL (c + d + e + f)								12,836				
14. SUMMARY OF INSTALLATION PROJECTS												
PROJECT DESIGNATION												
CATEGORY CODE NO.		PROJECT TITLE			TENANT COMMAND		UNIT OF MEASURE		AUTHORIZATION PROGRAM		FUNDING PROGRAM	
a		b			c		d		SCOPE e		ESTIMATED COST (\$000) f	
211.05		HELICOPTER MAINTENANCE HANGAR			-		SF		20,100		831	
									20,100		831	

421

## MARINE CORPS AIR STATION, QUANTICO, VA., \$831,000

This station provides air crew housing and direct helicopter support for the U.S. Executive helicopter fleet.

One project totaling \$831,000 will provide this station with a hangar to house the new VH53 Executive Fleet helicopters.

*Status of funds*

Cumulative appropriations through fiscal year 1973-----	0
Cumulative obligations, December 31, 1972 (actual)-----	0
Cumulative obligations, June 30, 1973 (estimated)-----	0

## DESIGN INFORMATION

Project	Design cost	Percent complete, Apr. 1, 1973
Helicopter maintenance hangar-----	\$49,500	13

Mr. SIKES. The request is for \$831,000 for a helicopter maintenance hangar. What type of hangar is this?

General JANNELL. This is a helicopter support facility. The project will provide 20,100 square feet of helicopter maintenance space with a 30-foot vertical clearance to accommodate the CH-53 helicopters in addition to other assigned aircraft.

Mr. SIKES. What are you utilizing at this time?

General JANNELL. At present we are using an A-frame arrangement outside to lift the rotor heads and engines off the helicopters. I have observed the maintenance personnel working in this fashion on several occasions including periods of inclement weather.

The primary problem with existing facilities, in addition to saturation, is the 18-foot clearance limitation for the overhead work. I might

add that the height of the CH-53, to the top of the rotorhead, is 17 feet, 1 inch, and the total height of the helicopter—this is the top of the tail rotor—is 24 feet, 11 inches.

Mr. SIKES. Which helicopters will this facility support?

General JANNELL. This project will provide hangar facilities for Marine Helicopter Squadron I, and elements of one tactical helicopter squadron. The CH-53, SH-3, CH-46, and UH-1 aircraft will be maintained in this hangar.

Mr. SIKES. Supply for the record the missions of each of these helicopters.

[The information follows:]

#### HELICOPTER MISSION

The mission of the helicopters assigned to Marine Helicopter Squadron 1 includes support for the Marine Corps Schools for the development of helicopter tactics, techniques, and landing force equipment and for student demonstration and indoctrination as directed. Provide special helicopter lift support as required by the Secretary of Defense.

The specific mission assigned to the CH-53 and CH-46 type helicopters is transportation of supplies, equipment, and personnel. The CH-53 is the larger of the two and lifts heavier loads. The SH-3 helicopter serves in a training role only. The Marine Corps basic utility helicopter UH-1 is assigned a combat utility support, multipurpose mission, including emergency supply/resupply, forward area casualty evacuation, command and control, liaison and courier duty, sea/air rescue and enemy observation. It should be noted that all Marine Corps helicopters are capable of and do perform in a multimission role.

#### MARINE CORPS DEVELOPMENT AND EDUCATION COMMAND, QUANTICO, VA.

Mr. SIKES. We will place page II-36 in the record.

[The page follows:]

1. DATE 19 FEB 1973		2. DEPARTMENT NAVY		3. INSTALLATION MARINE CORPS DEVELOPMENT AND EDUCATION COMMAND										
4. COMMAND OR MANAGEMENT BUREAU MARINE CORPS		5. INSTALLATION CONTROL NUMBER 8385-650		6. STATE/COUNTRY QUANTICO, VIRGINIA										
7. STATUS ACTIVE		8. YEAR OF INITIAL OCCUPANCY 1917		9. COUNTY (U.S.) PRINCE WILLIAM STAFFORD										
				10. NEAREST CITY 30 MILES NORTHEAST TO WASHINGTON, D. C.										
11. MISSION OR MAJOR FUNCTIONS To develop, in coordination with agencies and representatives of the other services, the doctrine, tactics, techniques and equipment employed by landing forces in amphibious operations Major Activities Supported: Officers Candidate School Marine Corps Education Center Major Functions: Identify required study areas and initiate study agencies, as appropriate Educate officers in the principles, tactics and techniques of warfare, with particular emphasis on amphibious operations and air-ground combat forces Conduct officer training courses for newly commissioned officers and advanced training for company and field grade officers		12. PERSONNEL STRENGTH		PERMANENT			STUDENTS			SUPPORTED			TOTAL	
				OFFICER (1)	ENLISTED (2)	CIVILIAN (3)	OFFICER (4)	ENLISTED (5)	OFFICER (6)	ENLISTED (7)	CIVILIAN (8)			(9)
		a. AS OF 31 DEC 1972		966	4,230	1,275	1,274	227	52	283	0			8,307
		b. PLANNED (End FY 1975)		743	4,784	1,367	1,684	2,278	350	1,167	0			12,373
				13. INVENTORY										
		LAND		ACRES (1)	LAND COST (\$000) (2)		IMPROVEMENT (\$000) (3)		TOTAL (\$000) (4)					
a. OWNED				57.079	3.198		88.187		91.685					
b. LEASE AND EASEMENT #		4,864* - 2 #		(0* - 0#)				91.685						
c. INVENTORY TOTAL (Exclpt land rent) AS OF 30 JUNE 18				72				4,024						
d. AUTHORIZATION NOT YET IN INVENTORY								4,379 1/						
e. AUTHORIZATION REQUESTED IN THIS PROGRAM								17,870						
f. ESTIMATED AUTHORIZATION - NEXT 4 YEARS								127,958						
g. GRAND TOTAL (c + d + e + f)														

14. SUMMARY OF INSTALLATION PROJECTS							
PROJECT DESIGNATION				AUTHORIZATION PROGRAM		FUNDING PROGRAM	
CATEGORY CODE NO. a	PROJECT TITLE b	TENANT COMMAND c	UNIT OF MEASURE d	SCOPE e	ESTIMATED COST (\$000) f	SCOPE g	ESTIMATED COST (\$000) h
723.10	ENLISTED MEN'S DINING FACILITY	-	SF	22,400	1,541	22,400	1,541
1_/ INCLUDES \$2,838,000 FOR POLLUTION ABATEMENT							

## MARINE CORPS DEVELOPMENT AND EDUCATION COMMAND, QUANTICO, VA., \$1,541,000

This activity conducts the officer candidate school, platoon leaders classes, and provides the basic and advanced training for all commissioned officers of the Marine Corps and personnel of other services, as assigned.

One project totaling \$1,541,000 will provide this Command with an enlisted dining facility.

*Status of funds*

Cumulative appropriations through fiscal year 1973-----	\$44,352,000
Cumulative obligations, Dec. 31, 1972 (actual)-----	36,697,459
Cumulative obligations, June 30, 1973 (estimated)-----	40,364,480

## DESIGN INFORMATION

Project	Design cost	Percent complete, Apr. 1, 1973
Enlisted men's dining facility-----	\$70,268	20

Mr. SIKES. The request is for an enlisted man's dining facility for \$1,541,000.

What is the location of the proposed messhall in relation to the population that it will serve?

General JANNELL. The dining facility is to be sited in a central location in a group of seven barracks which house enlisted marines who will be served by the proposed project. This building will serve up to 2,000 people housed and working within the immediate vicinity of the messhall. The project will provide a modern dining facility in lieu of three dining facilities which were built over 40 years ago.

Mr. SIKES. I have noted a number of facilities at Quantico that have needed replacement. Some of this work has been accomplished. How many of the old World War II temporary-type structures are you still using at Quantico?

General JANNELL. You may recall the modernization of some barracks.

Mr. SIKES. I know we have done some work. I want to know how far we have progressed.

General JANNELL. We will provide that for the record, sir.

## USE OF WW II BUILDINGS

Excluding family housing, a total of 441 usable buildings remain at Marine Corps Development and Education Command, Quantico, Va., that were constructed prior to the end of World War II. Of this total, 133 were originally temporary construction; 115 were semipermanent; and 193 were permanent construction. The majority of the 248 temporary and semipermanent structures remaining, are programed for replacement or demolition within Marine Corps Development and Education Command, Quantico, Va.'s 5-year program. These structures, in many instances, are small buildings with special purposes. Construction of a single new building will often eliminate the requirement for several of these semipermanent or temporary structures.

The 193 remaining permanent structures are of heavy construction, of a lasting nature. One hundred and seventeen of these buildings are considered adequate for the presently assigned use, four of which have recently undergone modernization. The remaining 76 structures are considered inadequate at present and are programed for various degrees of renovation/modernization during the next 5 fiscal years, which will render the buildings adequate for their assigned use.

MARINE CORPS BASE, CAMP LEJUNE, N.C.

Mr. SIKES. Insert page II-38 in the record.  
[The page follows:]

1. DATE 19 FEB 1973		2. DEPARTMENT NAVY		3. INSTALLATION FY 1974 MILITARY CONSTRUCTION PROGRAM		4. STATE/COUNTRY MARINE CORPS BASE			
5. COMMAND OR MANAGEMENT BUREAU MARINE CORPS			6. INSTALLATION CONTROL NUMBER 8270-175		7. STATE/COUNTRY CAMP LEJEUNE, NORTH CAROLINA				
7. STATUS ACTIVE			8. YEAR OF INITIAL OCCUPANCY 1941		9. COUNTY (U.S.) ONSLow		10. NEAREST CITY 4.3 MILES NORTHWEST TO JACKSONVILLE		
11. MISSION OR MAJOR FUNCTIONS Provide housing, training facilities, logistical support and certain administrative support for Fleet Marine Force Units and other units assigned.									
12. PERSONNEL STRENGTH									
PERMANENT STUDENTS SUPPORTED									
OFFICER (1) ENLISTED (2) CIVILIAN (3) OFFICER (4) ENLISTED (5) OFFICER (6) ENLISTED (7) CIVILIAN (8) TOTAL (9)									
a. AS OF 31 DEC 1972 252 2,696 3,011 69 1,282 1,253 23,282 0 31,845									
b. PLANNED (End FY1975) 282 2,333 2,437 116 5,620 1,633 27,190 0 39,611									
13. INVENTORY									
LAND ACRES (1) LAND COST (\$000) (2) IMPROVEMENT (\$000) (3) TOTAL (\$000) (4)									
a. OWNED 132,969 1,618 181,006 182,624									
b. LEASE# AND EASEMENTS# 1* - 0 # 0 33* - 0 # 33									
c. INVENTORY TOTAL (Except land rent) AS OF 30 JUNE 19 72 182,657									
d. AUTHORIZATION NOT YET IN INVENTORY 15,843									
e. AUTHORIZATION REQUESTED IN THIS PROGRAM 8,902									
f. ESTIMATED AUTHORIZATION - NEXT 4 YEARS 82,843									
g. GRAND TOTAL (c + d + e + f) 290,245									
14. SUMMARY OF INSTALLATION PROJECTS									
PROJECT DESIGNATION									
CATEGORY CODE NO. PROJECT TITLE TENANT COMMAND UNIT OF MEASURE AUTHORIZATION PROGRAM FUNDING PROGRAM									
a b c d e f g h									
211.34 FORCE TROOPS COMPLEX									
PARACHUTE AND SURVIVAL EQUIPMENT SHOP - SF 11,200 555 11,200 555									
722.11 HADNOT POINT AREA									
BACHELOR ENLISTED QUARTERS - SF 207,620 7,168 207,620 7,168									
821.22 CENTRAL HEATING PLANT EXPANSION - BH 100,000 1,179 100,000 1,179									
TOTAL 8,902 8,902									

427

## MARINE CORPS BASE, CAMP LEJEUNE, N.C., \$8,902,000

This activity is the training base for the Marine division assigned to the east coast and conducts specialized schools and individual combat training.

The program for this activity includes three projects totaling \$8,902,000 providing for a bachelor enlisted quarters, a parachute and survival equipment shop and utilities expansion.

*Status of funds*

Cumulative appropriations through fiscal year 1973-----	\$66,781,000
Cumulative obligations, Dec. 31, 1972 (actual)-----	53,046,448
Cumulative obligations, June 30, 1973 (estimated)-----	59,429,807

## DESIGN INFORMATION

Project	Design cost	Percent complete, Apr. 1, 1973
Parachute and survival equipment shop-----	\$29,420	17
Bachelor enlisted quarters-----	126,000	8
Central heating plant expansion-----	20,655	9

*Current bachelor enlisted status at Marine Corps Base, Camp Lejeune, Hadnot Point*

Effective BEQ requirement-----	\$13,063
Adequate assets-----	1,256
Installation-----	(1,144)
Community-----	(112)
Deficit-----	11,807
Fiscal year 1974 project-----	1,260
Remaining deficit after fiscal year 1974-----	10,547

Mr. SIKES. This is for a parachute and survival equipment shop, bachelor enlisted quarters and a central heating plant expansion.

Last year the long range manpower projection for this base was 41,806 as compared to 39,611 as shown here. Will you explain the difference?

General JANNELL. A recent decision to consolidate all east coast recruit training at Parris Island, S.C., will eliminate the Infantry training detachment at Camp Lejeune which heretofore conducted 1 week of training for recruits undergoing their 11 week indoctrination to the Marine Corps. This consolidation will provide a more effective utilization of both dollars and manpower resources by eliminating a recurring cost of recruit travel as it exists between Camp Lejeune and Parris Island within the recruit training cycle.

This reduction in permanent personnel and recruits is the basis for the 2,195 differential between fiscal year 1973 and fiscal year 1974 projections for Camp Lejeune.

## BACHELOR ENLISTED QUARTERS

Mr. LONG. At each installation where you are requesting new construction or modernization of bachelor enlisted quarters, please provide for the record a summary showing the bachelor housing situation both on and off the base.

General JANNELL. Yes, sir.

The Marine Corps fiscal year 1974 military construction program includes \$22.8 million for new construction of bachelor enlisted quar-

ters with 3,990 men at four installations. This represents 41.6 percent of the fiscal year 1974 military construction budget.

As you have requested, we will provide the specific information on the four installations involved for the record. (The information is included in the record in connection with last installation discussed.)

Mr. LONG. What percentage was that?

General JANNELL. 41.6 percent, sir.

Mr. LONG. That is just for the Marine Corps.

General JANNELL. That is correct, sir.

Mr. LONG. What are your long-range plans for providing bachelor housing here?

General JANNELL. Present plans call for the replacement of 66 of the existing World War II vintage H-type barracks with modern facilities, which meet current criteria, having three-man rooms with private toilet facilities for each room. The existing open squad bay barracks are a source of high operating and maintenance costs for substandard structures with poor lighting and ventilation, central heads, and associated problems attendant with 30-year-old buildings.

Mr. LONG. What was the total value of that bachelor enlisted quarter program?

General JANNELL. \$22.8 million, sir.

Mr. LONG. How does your bachelor housing program differ from your previous plans; that is, at Camp Lejeune?

General JANNELL. Previous plans called for modernization of the existing 30-year-old barracks buildings to provide three-man rooms. Various alternatives considered included rehabilitating existing buildings, providing three-man rooms with private baths; rehabilitating existing buildings providing three-man rooms, but reusing the existing central heads, and replacing existing buildings with new facilities meeting all current criteria. The decision to build new facilities was based upon the fact that rehabilitation of the existing buildings would approximate the cost of new construction.

Mr. LONG. Why did you have to abandon the modernization of the older quarters here?

General JANNELL. During May 1972, I personally escorted representatives of the Office of the Assistant Secretary of Defense, Installations and Logistics, on a visit to Camp Lejeune to inspect the existing barracks facilities. The decision to build new facilities was made as a result of this visit in conjunction with an economic analysis which indicated the cost of rehabilitation of the existing buildings to be 87 percent of the cost of new construction.

If you like, sir, I will be glad to provide comparative costs for the record.

#### DRAWBACKS OF REHABILITATION

Mr. LONG. I wish I knew why that were so. I always have an uncomfortable feeling that the figures might be loaded here to make a case; unintentionally, perhaps, but nevertheless so. You know, the cost of building modern housing of any kind nowadays is heavily influenced by the cost of lumber, which has skyrocketed. Lumber is just as good in houses 40 or 50 years old as the day it was put in, maybe better, unless it happens to have rotted. We have houses in New England which are 200 or 300 years old, and the wood is as good as it was origi-

nally. It is a little bit puzzling to me why suddenly you decide that modernization is an impossibly high percentage of the cost and you have to build anew, which I suppose means tearing down and disposing of all that lumber.

General JANNELL. Yes, sir.

As I understand in the process of rehabilitating old buildings, this involves getting into the plumbing, and the electrical work, which is quite costly. Perhaps Admiral Marschall could address that cost aspect.

Admiral MARSCHALL. I think one of the problems is that when you try to rehabilitate an old structure which was never intended for the type of use to which we now want to put it—for example, with individual heads, with air-conditioning, with the various plumbing features that are required—you essentially gut the structure and sometimes don't have adequate space within the structure to accommodate what you want to do. We made many, many of these studies and too often they turn out, as General Jannell has indicated, cost prohibitive compared to a new structure.

Mr. LONG. This raises a very interesting question, Admiral. How often do you figure you will have to remodel these structures? When were these things built?

Admiral MARSCHALL. As General Jannell pointed out, these are 30-year-old structures.

Mr. LONG. Are we going to remodel every 30 years?

Admiral MARSCHALL. I do not think so.

#### DURABILITY OF BUILDINGS

Mr. LONG. You are going to have new standards, and new ideas 30 years from now. If we are going to look from the standpoint of remodeling every 30 years, and it costs as much to modernize as it does to build new, then maybe this is the way we ought to think about it. You are going to build for a 30-year timeframe, and then tear down and re-do. I don't know what the implications are, but I am awfully tired of hearing, as I have for so many years, once a building is 25 or 30 years old, it is no good anymore.

Admiral MARSCHALL. When you build a house to live in, your normal mortgage is either 20 or 30 years. You do not get any more than 30 years on a mortgage. I think—

Mr. LONG. My home was built in 1936.

Admiral MARSCHALL. Yes, I realize that.

Mr. LONG. It is worth three times what it was and we have not done anything to it except modernize the kitchen.

Admiral MARSCHALL. I think we all have these experiences. What I am saying is that based on normal practices for financing, if nothing else, a 25-year life is a good average life. Let us take the context in which we are speaking here.

Mr. LONG. Just a minute, Admiral. The mortgage life of a house has absolutely nothing to do with its physical life or its value life.

Admiral MARSCHALL. Yes, sir; I fully recognize that.

Mr. LONG. It is totally irrelevant.

Admiral MARSCHALL. By the same token, we are always asked to make economic evaluations of projects, and you cannot anticipate that any structure will last forever.

Mr. LONG. The 25 years of the mortgage has nothing to do with the value of the home. We all know homes are going up in value. It has to do with the lifespan of the person buying it and the unwillingness of the bank to look much beyond 25 years because by the time a fellow pays off a mortgage, he may be dead. Usually the mortgages are paid off fairly quickly and refinanced. My own has been refinanced a couple of times since I bought the house. I think your analogy there is totally irrelevant.

Admiral MARSCHALL. All I am saying is that the normal economic life has to be given a value and we have found that 25 years is essentially what we must talk about.

Mr. LONG. There I think you are totally wrong. I think we have got to rethink this whole thing as a matter of our construction policy. You cannot insist that you are going to tear down buildings every 25 or 30 years when the rest of the people in this country are building and living in homes that last 50, 60, 70, 100 years.

Admiral MARSCHALL. Dr. Long, we don't intend to do this. And we don't. We have rehabilitated many, many structures—barracks, for example—which were built to good standards when they were built. But let us put this thing in context that General Jannell is talking about. These structures were thrown up in the war years when we needed things in a hurry, and we needed them badly. These structures have just plain outlived the usefulness to which we would like to put them today.

Mr. LONG. Now you are getting to a real point which I can understand. But I wish you would get to that point and not get so many other points that are invalid before you get to it.

If it is true that we built a lot of structures in a hurry in World War II, and we made a great mistake and they have to be rebuilt, because it would cost too much to modernize, let us put it on that one-time basis.

Admiral MARSCHALL. That is essentially what we are talking about in this project, yes, sir.

Mr. LONG. I would like some assurance that we are not going to have the same thing happen to us in another 25 or 30 years, just like the West Point Hospital we are considering. This is a different service so you can look at this objectively. If you look at that hospital it looks as good as most hospitals I go through; in fact, better, and the Army wants to rebuild it, although I am told it would cost \$22 million to modernize. That is not even the original figure. They raised the price of what it would cost to modernize, as compared to \$25 million new. That hospital was not thrown up in any hurry. It was built so strong and hard that is the reason the Army claims it cannot modernize it: they built it too well. One cannot win on this.

#### COST JUSTIFICATION

Mr. SIKES. Why is the modernization cost proportionately so high on these structures?

Admiral MARSCHALL. I think we have changed our standard of living, and today we are expected to provide amenities which we did not even dream about when these structures were built, mainly air-conditioning and semiprivate facilities. The cost of the mechanical and elec-

trical work in any structure that we build these days really drives the cost of the building, unless there are unusual foundation problems.

Mr. SIKES. What use can you make of these buildings? Will there be any requirement for them after new ones are provided?

Admiral MARSCHALL. General, I would defer to you on this one.

General JANNELL. Yes, sir. It is planned to demolish 66 of these 76 buildings. The remaining buildings will be used for administration and training.

Mr. NICHOLAS. These are brick on the outside?

General JANNELL. Yes, sir.

Mr. NICHOLAS. Are they wood inside?

General JANNELL. They are concrete with a wood roof. As an aside, you will recall we are taking barracks at Quantico, and we are rehabilitating those and not building new ones.

It was our considered opinion in conjunction with the Naval Facilities Engineering Command and the engineers from the Office of Secretary of Defense, I. & L., that we should build new barracks.

Mr. SIKES. Normally the old brick structures are so well built and so durable that it seems a pity to have to demolish them but if there is no economy in keeping them, we could not justify just keeping them because they are something where the walls will endure for a long time.

I would like for some members of the committee to see this before we make a final decision on it.

#### USE OF EXISTING FACILITIES

Mr. LONG. What will you do with the existing BEQ facilities?

General JANNELL. Mr. Chairman, I would like to point out in regard to the Camp Lejeune barracks that we have 10,000 marines of the 2d Marine Division living in those barracks, which are very old facilities. They lack the amenities expected nowadays that we are trying to provide our young people. As I mentioned earlier, the lighting is poor. We do have problems with the old plumbing in the central heads. There is no air-conditioning. I think to have new facilities—as you recall, and in fact you approved our air-conditioning for 66 of these barracks to cover the interim period in the time it would take to build new ones—that air-conditioning project will certainly help the morale of the men there. I have talked to them. Air-conditioning seems to be the big thing and in the long range they have new facilities to look forward to.

Mr. SIKES. Are there any nearby military activities which would have a use for these facilities in their present condition?

General JANNELL. No, sir. We require the space that these present facilities are on and use of the present utility lines. That is the reason we are going to have to tear down 66 of these.

Mr. SIKES. Will the project for the expansion of the heating plant complete the requirements?

General JANNELL. Yes, sir.

Mr. SIKES. Dr. Long?

Mr. LONG. I would like to have in the record, if you could, General, exactly when these quarters were built.

General JANNELL. Yes, sir.

Mr. LONG. I would like, if you could, to have a detailed estimate of the cost of building new, and a detailed estimate of the cost of

modernization, so that we have something that we feel has been done very carefully as a comparison of cost and not something that is just off the cuff.

General JANNELL. Yes, sir.

[The information follows:]

The 76 open-dormitory style barracks at Camp Lejeune's Hadnot Point Area, were constructed of brick veneer in 1941 and 1942. An economic analysis is provided for the record as requested.

#### ECONOMIC EVALUATION OF MILITARY CONSTRUCTION INVESTMENTS

##### GENERAL INFORMATION

- (1) Submitting component : Department of the Navy.
- (2) Name of activity : Marine Corps Base, Camp Lejeune, N.C.
- (3) Date of submission : November 15, 1972.
- (4) Project title description of project objective :  
Bachelor enlisted quarters (P-210). The objective of this project is to correct present bachelor enlisted housing deficiencies.
- (5) Alternative available :

Identification	Investment year	Economic life (yr)	Description
A.....	1974	25	Rehabilitate 68 existing H-type barracks to a capacity of 148 men/barracks (total 10,064 men) in accordance with improved bachelor housing criteria. Construct private toilet additions and private entrances to each bedroom, including new stairs. Retain 8 existing barracks for other uses.
B.....	1974	25	Rehabilitate 73 existing H-type barracks to a capacity of 136 men/barracks (total 9,298 men) in accordance with improved bachelor housing criteria. Provide private toilets internally and private entrances to each bedroom, including new stairs. Retain 3 existing barracks for other uses.
C.....	1974	25	Rehabilitate 71 existing H-type barracks to a capacity of 142 men/barracks (total 10,082 men) in accordance with improved bachelor housing criteria. Reuse existing gang heads. Provide additional fire exits and stairs necessary to meet National Exits Code. Retain 5 existing barracks for other uses.
D.....	1974	25	Replace present substandard barracks with 20 new 504 man enlisted quarters (total 10,080 men). Demolish 53 existing structures. Retain 23 existing barracks for other purposes.

6. Name and title of principal action officer : Public works officer.

#### ECONOMIC EVALUATION OF MILITARY CONSTRUCTION INVESTMENTS—SUMMARY TABLE

Alternate	Net investment cost	Net investment cost/SF	Net investment cost/man	(Investment plus annual) total cost	(Investment plus annual) total cost/man
A.....	\$46,679,258	\$20.92	\$4,638	\$61,580,784	\$6,119
B.....	43,931,066	20.35	4,425	58,043,205	5,846
C.....	23,191,443	12.42	2,300	36,504,109	3,621
D.....	48,267,779	29.00	4,788	58,830,162	5,836

#### STATEMENT OF CONCLUSIONS AND RECOMMENDATIONS

After a thorough perusal of the figures contained in this economic analysis and the remarks at the end, there seems little doubt that the best interest of the building users and the U.S. Government would only be served by the construction of new barracks, as in alternate D. Since alternate C falls so very short of the stated goal of this project it can not be evaluated fairly against the others. Alternate A has a total cost which exceeds alternate D and therefore should be eliminated by both economics and functional deficiency. Finally alternate B, while costing a small amount less than D, actually costs more per man and it, too, still contains certain functional deficiencies as listed hereinafter under "remarks."

Having recommended new construction, we would further suggest that the U.S. Marine Corps would best be served by a BEQ designed specifically for the needs of Camp Lejeune and compatible with the environment of that base. A project of the magnitude of this one will have such an impact on the overall appearance of Camp Lejeune for the next quarter of a century that the use of a "typical" or site adapted design does not seem appropriate.

ECONOMIC EVALUATION OF MILITARY CONSTRUCTION INVESTMENTS  
ALTERNATE (A) VERSUS ALTERNATE (B)

	(A)	(B)	(A) minus (B)
<b>1-TIME COST DATA</b>			
1. Alternate identification			
2. Investment cost: (a) Rehabilitate existing barracks	\$47,504,258.00	\$49,931,066.00	\$3,573,192.00
3. Working capital changes, plus or (minus)	0	0	0
4. Less value of existing assets replaced (plus) or minus	0	0	0
5. Plus value of existing assets to be employed: (barracks to be retained for other uses)	825,000.00	0	(825,000.00)
6. Differential net investment			2,748,192.00
7. Net investment cost per square foot	20.92	20.35	
Differential, plus or (minus)			.57
8. Net investment cost per man	4,638.00	4,425.00	
Differential, plus or (minus)			213.00

	(A)	(B)	Savings (A) minus (B)
<b>ANNUAL COSTS AND SAVINGS/INVESTMENT RATIO</b>			
1. Alternate identification			
2. Annual costs:			
(a) Personnel (included in operating maintenance costs)			
(b) Operating:			
(1) Fuel/utility costs	\$774,269.00	\$750,731.00	\$23,538.00
(2) Maintenance costs	790,360.00	731,014.00	59,346.00
(c) Overhead (no change)			
3. Total annual savings			82,884.00
4. Present value factor			(9.524)
5. Present value of annual savings			789,387.00
6. Differential net investment			2,748,192.00
7. Savings/investment ratio (since alternate A cost more in both investment and annual costs there is no savings/investment ratio and alternate B is therefore the obvious better choice to evaluate against alternate C)			

## ALTERNATE (B) VERSUS ALTERNATE (C)

	(B)	(C)	(B) minus (C)
<b>1-TIME COST DATA</b>			
1. Alternate identification.....			
2. Investment cost: (a) Rehabilitate existing barracks.....	\$43,931,066.00	\$23,521,443.00	\$20,409,623.00
3. Working capital changes, plus or (minus).....	0	0	0
4. Less value of existing assets replaced, (plus) or minus.....	0	0	0
5. Plus value of existing assets to be employed (barracks to be retained for other uses).....	0	(330,000.00)	330,000.00
6. Differential net investment.....			20,739,623.00
7. Net investment cost per square foot.....	20.35	12.42	
Differential, plus or (minus).....			7.93
8. Net investment cost per man.....	4,425.00	2,300.00	
Differential, plus or (minus).....			2,125.00

## ANNUAL COSTS AND SAVINGS/INVESTMENT RATIO

1. Alternate identification.....			
2. Annual costs:			
(a) Personnel included in operating maintenance costs.....			
(b) Operating:			
(1) Fuel/utility costs.....	750,730.00	716,417.00	34,313.00
(2) Maintenance costs.....	731,014.00	681,385.00	(49,629.00)
(c) Overhead: No change.....			
3. Total annual savings.....			83,942.00
4. Present value factor.....			(9.524)
5. Present value of annual savings.....			799,463.00
6. Differential net investment.....			20,739,623.00
7. Savings/investment ratio (Since alternate B cost more in both investment and annual costs there is no savings/investment ratio and alternate C is therefore the choice to evaluate against alternate D).....			

## ALTERNATE (B) VERSUS ALTERNATE (D)

	(B)	(D)	(D) minus (B)
<b>1-TIME COST DATA</b>			
1. Alternate identification.....			
2. Investment cost:			
(a) Rehabilitate existing barracks.....	\$43,931,066.00	0	(\$43,931,066.00)
(b) Construct new 504-man barracks.....	0	\$51,249,779.00	51,249,779.00
Total.....	43,931,066.00	51,249,779.00	7,318,713.00
3. Working capital changes, plus or (minus).....	0	0	0
4. Less value of existing assets replaced, (plus) or minus.....	0	318,000.00	318,000.00
5. Plus value of existing assets to be employed (barracks to be retained for other uses).....	0	(3,300,000.00)	(3,300,000.00)
6. Differential net investment.....			4,336,713.00
7. Net investment cost per square foot (differential, plus, or (minus).....	20.35	29.00	8.65
8. Net investment cost per man (differential, plus or (minus).....	4,425.00	4,788.00	363.00

## ALTERNATE (C) VERSUS ALTERNATE (D)

	(C)	(D)	(C) minus (D)
<b>ANNUAL COSTS AND SAVINGS/INVESTMENT RATIO</b>			
1. Alternate identification.....			
2. Annual costs:			
(a) Personnel included in operating maintenance costs.....			
(b) Operating:			
(1) Fuel/utility costs.....	\$716,417.00	\$700,488.00	\$15,929.00
(2) Maintenance costs.....	681,385.00	408,540.00	272,845.00
(c) Overhead: No change.....			
3. Total annual savings.....			288,774.00
4. Present value factor.....			(9.524)
5. Present value of annual savings.....			2,750,284.00
6. Differential net investment.....			25,241,336.00
7. Savings/investment ratio (since the ratio is less than 1 the obvious economic choice is alternate (C), however, since (C) does not comply with minimum BEQ requirements, evaluate alternate (D) against alternate (B)).....			(0.11)
	(C)	(D)	(D) minus (C)

## 1-TIME COST DATA

1. Alternate identification.....			
2. Investment cost:			
(a) Rehabilitate existing barracks.....	\$23,521,443.00	0	(\$23,521,443.00)
(b) Construct new 504-man barracks.....	0	\$51,249,779.00	51,249,779.00
Total.....	23,521,443.00	51,249,779.00	27,728,336.00
3. Working capital changes, plus or (minus).....	0	0	0
4. Less value of existing assets replaced, (plus) or minus.....	0	318,000.00	318,000.00
5. Plus value of existing assets to be employed (barracks be retained for other uses).....	(330,000.00)	(3,300,000.00)	(2,805,000.00)
6. Differential net investment.....			25,241,336.00
7. Net investment cost per square foot: (differential, plus or (minus)).....	12.42	29.00	16.58
8. Net investment cost per man (differential, plus or (minus)).....	2,300.00	4,788.00	2,488.00

## ALTERNATE (B) VERSUS ALTERNATE (D)

	(B)	(D)	(B) minus (D)
<b>ANNUAL COSTS AND SAVINGS/INVESTMENT RATIO</b>			
1. Alternate identification.....			
2. Annual costs:			
(a) Personnel included in operating maintenance costs.....			
(b) Operating:			
(1) Fuel/utility costs.....	\$750,731.00	\$700,488.00	\$50,243.00
(2) Maintenance costs.....	731,014.00	408,540.00	322,474.00
(c) Overhead: No change.....			
3. Total annual savings.....			372,717.00
4. Present value factor.....			(9.524)
5. Present value of annual savings.....			3,549,757.00
6. Differential net investment.....			4,336,713.00
7. Savings/investment ratio.....			(0.82)

## REMARKS

Since the basic need for this line item is to correct physical deficiencies in present bachelor quarters, the foregoing economic analyses cannot be accurately evaluated without consideration of certain remaining deficiencies. There are as follows:

1. Alternate C which appears to be the base economic choice has the following counteractive characteristics:

(a) The use of "gang" toilet and shower facilities is contrary to NAVFACINST 11012.114C, section I, para. D which states in part, "For MARCORPS BEQS, each bedroom shall be provided with a private bathroom."

(b) Existing interior column spacing on the first floor (8'-0" o.c.) does not lend itself to normal three man rooms. The design, therefore, was modified to space partitions 16'-0" o.c. creating rooms large enough for four men instead of three as suggested in NAVFACINST 11012.11C, section II, para. A., 1. The resulting column in the center of each room is certainly less than desirable.

(c) No provision has been made for a laundry. NAVFACINST 11012.11C, section II, para. V. says "Provide for one laundry washer and dryer (GFE) per 30 men."

2. Alternate B has the following undesirable design characteristics:

(a) The installation of interior toilets will cause a maximum of demolition of existing floors and ceilings to install the required plumbing.

(b) Two rooms on each floor are unusable since there is no way to obtain minimum natural light and ventilation for them due to their location. These rooms may be used for storage or laundries, however.

3. Alternate A seems to be the one which most nearly complies with current DOD criteria and NACFACINST 11012.114C; however, the total cost of this rehabilitation of 20-30 year old buildings exceeds that of new barracks. This alternate also has the following adverse design characteristics:

(a) Four bedrooms have been created on each floor which are unusable due to the absence of windows. These may be used for storage or laundries, however.

(b) The elimination of many windows as a result of adding toilets to exterior walls reduces natural light and ventilation provisions below the minimums stipulated in DOD Construction Criteria Manual, 4270.1M, table 5-2.

4. All of the rehabilitation alternates (A, B, & C) have certain common adverse characteristics. These are:

(a) The buildings have already been in existence beyond the design life of many materials. Items such roof shingles, wood trim, doors, windows, hardware, piping, etc. will undoubtedly become constant maintenance problems. While the cost of this maintenance is included in the economic analysis the inconvenience to users and the work load on Maintenance Personnel should also be considered.

(b) The esthetic qualities of these outdated structures, even after the "face-lifting" possible in alternates A & B, is far short of that which would stimulate incentive and inspire higher morale in keeping with contemporary concepts of the modern Marine Corps. The appearance of the adjacent landscape would be further impaired by the addition of air cooled water chillers and their collateral fence between each pair of barracks.

5. DOD Construction Criteria Manual 4270.1M, table 4-1, calls for paved parking in a minimum amount of spaces of 33 percent of the peacetime design capacity of the barracks. While alternate D provides for this, alternates A, B, & C provide for no parking at all.

6. Finally, architectural and engineering fees will undoubtedly be high for the rehabilitation of existing barracks due to the fact that over the years many modifications have been made to some barracks but not to others; only through a thorough building by building survey and subsequent documentation of existing conditions could accurate bidding documents be created. Two other facts for the consideration of the evaluator are as follows:

1. Alternates A & B utilize only 68 and 71 of the existing 76 barracks. The remaining structures would be used for administrative space, storage or some other purpose appropriate to the mission of Camp Lejeune.

2. Alternate D, being much more compact in design, would release 23 buildings for other uses.

#### BUILDING DEMOLITION

Mr. DAVIS. To clarify this, you speak in the justification of the demolition of 6 buildings and down below it refers to 76 existing open door dormitory type bachelor enlisted quarters, and I believe in response to the Chairman's question you indicated that a substantial number of buildings, more than 6, are going to be demolished. Will you clarify that for me?

General JANNELL. The long-range plans are to demolish 66 of these buildings. As they build the new ones, they will require the existing site to build the new barracks. We are anticipating this will possibly take us 10 or 12 years.

Mr. DAVIS. This is just the first increment we are talking about here?

General JANNELL. Yes, sir.

Mr. DAVIS. When you speak of \$28 and some cents a square foot, that represents the overall cost including the air-conditioning and everything that you are speaking of.

Is that an entire package?

General JANNELL. That is the programing package, \$28 per square foot, sir.

Admiral Marschall, would you care to address that \$28 a square foot?

Admiral MARSCHALL. That is the cost to the 5 foot line, which is our normal procedure of estimating. That compares rather favorably with many other structures which we have put up recently.

Mr. DAVIS. That is about a 6-percent increase over last year.

Commander KIRKPATRICK. About 6 percent, yes, sir.

Admiral MARSCHALL. Just about 6 percent, Mr. Davis.

Mr. DAVIS. I agree with the chairman that we ought to see this one for ourselves. That is all, Mr. Chairman.

#### MARINE CORPS AIR STATION, CHERRY POINT, N.C.

Mr. SIKES. We will insert page 11-42 in the record.

[The page follows:]

1. DATE 17 APR 1973		2. DEPARTMENT NAVY		3. FY 1974 MILITARY CONSTRUCTION PROGRAM			4. INSTALLATION MARINE CORPS AIR STATION				
5. COMMAND OR MANAGEMENT BUREAU MARINE CORPS			6. INSTALLATION CONTROL NUMBER 8139-080		7. STATE/COUNTRY CHERRY POINT, NORTH CAROLINA						
8. STATUS ACTIVE		9. YEAR OF INITIAL OCCUPANCY 1942		10. COUNTY (U.S.) CRAVEN		11. NEAREST CITY 19 MILES NORTHEAST TO NEW BERN					
11. MISSION OR MAJOR FUNCTIONS Maintain and operate facilities and provide services and material to support operations of a Marine Aircraft Wing, or units thereof, and other activities and units as designated by the Commandant of the Marine Corps in coordination with the Chief of Naval Operations.  Major Units Supported: 1 Marine Aircraft Wing (less 2 fighter-attack groups and 1 helicopter group) plus training detachment 1 Marine Combat Crew Readiness Training Group with 4 flying squadrons 1 Light Anti-Aircraft Missile Battalion Naval Air Rework Facility				12. PERSONNEL STRENGTH			13. STUDENTS			TOTAL (B)	
				PERMANENT			SUPPORTED				
				OFFICER (1)	ENLISTED (2)	CIVILIAN (3)	OFFICER (4)	ENLISTED (5)	OFFICER (6)	ENLISTED (7)	CIVILIAN (8)
				A. AS OF 31 DEC 1972	128	1,004	1,148	172	358	865	7,159
B. PLANNED (END FY 1975)	300	2,698	1,521	145	700	653	5,551	2,113	13,681		
14. INVENTORY				TOTAL (\$000)							
LAND		ACRES (1)		LAND COST (\$000) (2)		IMPROVEMENT (\$000) (3)		TOTAL (\$000) (4)			
A. OWNED		26,493		424		146,648		147,072			
B. LEASE AND EASEMENTS		150* - 41#		0* - 5#		4* - 0#		9			
C. INVENTORY TOTAL (EXCEPT LAND RENT) AS OF 30 JUNE 19 72				147,081							
D. AUTHORIZATION NOT YET IN INVENTORY				15,689							
E. AUTHORIZATION REQUESTED IN THIS PROGRAM				3,019 1/							
F. ESTIMATED AUTHORIZATION - NEXT 4 YEARS				11,940							
G. GRAND TOTAL (C + D + E + F)				177,729							
14. SUMMARY OF INSTALLATION PROJECTS											
PROJECT DESIGNATION				TENANT COMMAND		AUTHORIZATION PROGRAM		FUNDING PROGRAM			
CATEGORY CODE NO.	PROJECT TITLE			UNIT OF MEASURE	SCOPE	ESTIMATED COST (\$000)	SCOPE	ESTIMATED COST (\$000)			
a	b			c	d	e	f	g			
821.22	STEAM PLANT IMPROVEMENTS			-	IS	-	1,821	-	1,821		
1/ INCLUDES \$1,198,000 FOR POLLUTION ABATEMENT											

439

## MARINE CORPS AIR STATION, CHERRY POINT, N.C., \$1,821,000

This Station supports the operation of the 2d Marine Air Wing and the naval air rework facility and has one project totaling \$1,821,000 which will provide steamplant improvements.

*Status of funds*

Cumulative appropriations through fiscal year 1973-----	\$74, 272, 000
Cumulative obligations, Dec. 31, 1972 (actual)-----	68, 840, 502
Cumulative obligations, June 30, 1973 (estimated)-----	70, 940, 079

*Design Information*

Project: Steamplant improvements

Design costs-----	\$100, 000
Percent complete April 1, 1973-----	9

Mr. SIKES. The request is for \$1,821,000 for steamplant improvements. The justification sheet mentions a previous plan to close the naval air rework facility.

What were these plans, when and why were they changed?

General JANNELL. As you are aware, sir, this facility is under Chief of Naval Operations control and administration. I am not positive as to the details and ramification of the previous plans and would respectfully request Admiral Marschall to respond to this matter.

Admiral MARSCHALL. Mr. Chairman, for many years we have been studying our air rework facilities and as you know, Cherry Point is the smallest. We made the conscious decision in the base realignment program to close Quonset for the many reasons which Mr. Sanders provided in prior testimony. The result is that the tenure of NARF, Cherry Point, becomes very firm, because as was previously indicated in our testimony, the utilization of these NARF's will be in the mid-80 range, which is high utilization. We feel that the NARF, Cherry Point, will be with us for the foreseeable future.

Mr. SIKES. Will the project requested here complete the requirements?

General JANNELL. Yes, sir.

Currently our steam generation is supplemented by a mobile utility support equipment portable system provided by the Navy. The project will replace three antiquated boilers which were built in 1934 for the Brooklyn Navy Yard. These were subsequently relocated to Cherry Point in 1942. This project will complete our anticipated steam requirements at the Marine Corps Air Station.

Mr. NICHOLAS. The justification sheet says that the naval air rework facility was scheduled for closure in fiscal 1971 and that this closure was reversed in 1972. The base closure announcement this year obviously is dated 1973, but was a package on which considerable work had been done before that time. Was the reversal of the closure directly related to the most recent base closure study, or was it determined that the closure should be reversed earlier before the current base closure study became firm?

Admiral MARSCHALL. This is related to the current base closure exercise which we went through. There had been a previous base closure list developed, but at some point after this list was proposed it was decided that there would not be closures. Subsequently there was a more comprehensive study made by the Navy, and it became obvious that we needed this NARF. This is particularly true now in view of the closure of Quonset Point. The recent overall base closure study, which was a very detailed analysis, supported the prior decision to retain the NARF at Cherry Point.

MARINE CORPS AIR STATION (HELICOPTER), NEW RIVER, N.C.

Mr. SIKES. Insert page II-44 in the record.

[The page follows:]

1. DATE <b>19 FEB 1973</b>		2. DEPARTMENT <b>NAVY</b>		3. INSTALLATION <b>FY 19 74 MILITARY CONSTRUCTION PROGRAM</b>				5. INSTALLATION <b>MARINE CORPS AIR STATION (HELICOPTER)</b>						
4. COMMAND OR MANAGEMENT BUREAU <b>MARINE CORPS</b>				6. STATE/COUNTRY <b>NEW RIVER, NORTH CAROLINA</b>				8. INSTALLATION CONTROL NUMBER <b>8139-510</b>						
7. STATUS <b>ACTIVE</b>				9. YEAR OF INITIAL OCCUPANCY <b>1942</b>				9. COUNTY (U.S.) <b>ONSLow</b>		10. NEAREST CITY <b>50 MILES SOUTH TO WILMINGTON</b>				
11. MISSION OR MAJOR FUNCTIONS To maintain and operate facilities and provide services and material to support operations of a Marine Aircraft Wing, or units thereof, and other activities and units as designated by the Commandant of the Marine Corps in coordination with the Chief of Naval Operations.  <u>Major Units Supported:</u> One Marine Helicopter Group One Marine Helicopter Training Group One Marine Air Control Squadron				12. PERSONNEL STRENGTH		PERMANENT			STUDENTS		SUPPORTED		TOTAL (9)	
				OFFICER (1)	ENLISTED (2)	CIVILIAN (3)	OFFICER (4)	ENLISTED (5)	OFFICER (6)	ENLISTED (7)	CIVILIAN (8)			
				a. AS OF <b>31 DEC 1972</b>		54	563	203	62	170	513	3,696	0	5,261
				d. PLANNED (End FY 1975)		98	817	216	112	140	468	2,994	0	4,845
				13. INVENTORY										
LAND		ACRES (1)		LAND COST (\$000) (2)		IMPROVEMENT (\$000) (3)		TOTAL (\$000) (4)						
a. OWNED		3,749		108		47,682		47,790						
b. LEASES AND EASEMENTS		955 * - 0#		( 3* - 0# )		2,156* - 0#		2,156						
c. INVENTORY TOTAL (Except land rent) AS OF 30 JUNE 19 <b>72</b>								49,946						
d. AUTHORIZATION NOT YET IN INVENTORY								7,112						
e. AUTHORIZATION REQUESTED IN THIS PROGRAM								3,245						
f. ESTIMATED AUTHORIZATION - NEXT 4 YEARS								9,630						
g. GRAND TOTAL (c + d + e + f)								69,933						
14. SUMMARY OF INSTALLATION PROJECTS														
PROJECT DESIGNATION														
CATEGORY CODE NO. a	PROJECT TITLE b	TENANT COMMAND c	UNIT OF MEASURE d	AUTHORIZATION PROGRAM		FUNDING PROGRAM								
				SCOPE e	ESTIMATED COST (\$000) f	SCOPE g	ESTIMATED COST (\$000) h							
211.37	AVIONICS SHOP	-	SF	7,147	470	7,147	470							
821.22	UTILITIES EXPANSION	-	LS	-	2,775	-	2,775							
				TOTAL	3,245		3,245							

442

## MARINE CORPS AIR STATION (HELICOPTER), NEW RIVER, N.C., \$3,245,000

This station supports the operations of all Marine Corps east coast helicopter squadrons and has two projects totaling \$3,245,000 which will provide an avionics shop and utilities expansion.

*Status of funds*

Cumulative appropriations through fiscal year 1973-----	\$41, 034, 000
Cumulative obligations, Dec. 31, 1972 (actual)-----	34, 051, 884
Cumulative obligations, June 30, 1973 (estimated)-----	36, 630, 024

## DESIGN INFORMATION

Project	Design cost	Percent complete Apr. 1, 1973
Avionics shop-----	\$25, 855	14
Utilities expansion-----	144, 000	8

Mr. SIKES. The request is for \$3,245,000 for an avionics shop and utilities expansion.

How many helicopters do you have here? How many are deployed at any one time?

General JANNELL. Sir, we have 200 helicopter aircraft assigned to Marine Corps Air Station (Helicopter), New River, N.C. Of this number, 22 helicopters are continuously deployed with the 6th Fleet. In addition, we have 30 fixed wing observation and proficiency aircraft based here.

Mr. SIKES. What savings can be shown from the avionics shop?

General JANNELL. Although savings in terms of dollars are difficult to quantify, savings in man-hours will occur with this consolidated facility. Additional savings will be generated by reducing the use of expeditionary combat equipment such as generators and the reduction of air-conditioning and dehumidification losses caused by numerous outside entrances.

Mr. SIKES. What are you using now?

General JANNELL. They are using several trailers that are widely scattered.

Mr. SIKES. That should not be. Will the utilities expansion complete the requirements?

General JANNELL. Yes, sir.

Mr. SIKES. Why is there a need to expand the utilities or is this replacement also, and modernization?

General JANNELL. This project provides a new central steamplant and expansion of the Camp Geiger sewage plant to serve New River. It will further provide an expansion for the existing water treatment plant at New River which will provide service to adjacent Camp Geiger.

In addition the project will provide new primary electric distribution lines. The current utility usage at New River exceeds the plant's rated capacities, causing overloads.

Mr. SIKES. Will this complete the requirements?

General JANNELL. Yes, sir, it will.

## TERTIARY SEWAGE PLANTS

Mr. McEWEN. Are there civilian communities in the area doing tertiary treatment?

General JANNELL. Not to my knowledge. I think the Defense Department is way ahead of our civilian communities in antipollution efforts.

Mr. McEWEN. Do you know how many of our bases now have or are building tertiary treatment?

General JANNELL. No, sir, I do not. I can provide that for the record.

Admiral MARSCHALL. We will try to find out for you. I do not know, sir.

Mr. McEWEN. To my knowledge we have some which have not gotten secondary treatment yet.

Admiral MARSCHALL. Yes, sir.

Mr. McEWEN. I wondered if we had any or many tertiary treatment plants. You will furnish that for the record?

Admiral MARSCHALL. Yes, sir.

[The information follows:]

## TERTIARY PLANTS PROGRAMED

The fiscal year 1974 military construction program includes one tertiary treatment plant which is part of the pollution abatement facilities for the Marine Corps Development and Education Command at Quantico, Va. This treatment is being provided in response to the State of Virginia standards.

Currently there are no tertiary treatment plants under construction nor does the Navy currently have any in existence within the strict definition of tertiary treatment; however, some bases do provide polishing ponds following secondary treatment. This is not considered to be tertiary treatment per se. The future for tertiary treatment plants in the Navy will be determined by the Federal, State, and local standards which are still evolving in response to Public Law 95-200 and its impact requiring more stringent abatement measures to meet stream quality standards.

## FLEET MARINE FORCE, ATLANTIC, NORFOLK, VA.

Mr. DAVIS. Turning to the Fleet Marine Force, Atlantic, Norfolk, we will insert page II-47 in the record.

[The page follows:]

1. DATE 19 FEB 1973		2. DEPARTMENT NAVY		3. FY 19 74 MILITARY CONSTRUCTION PROGRAM			5. INSTALLATION FLEET MARINE FORCE, ATLANTIC							
4. COMMAND OR MANAGEMENT BUREAU MARINE CORPS				8. INSTALLATION CONTROL NUMBER 8360-280		6. STATE/COUNTRY NORFOLK, VIRGINIA								
7. STATUS ACTIVE				9. YEAR OF INITIAL OCCUPANCY 1951		5. COUNTY (U.S.) NORFOLK		10. NEAREST CITY WITHIN CITY						
11. MISSION OR MAJOR FUNCTIONS Manages the operations, training, administration and logistics of assigned ground and aviation forces within the cognizance of the Atlantic Fleet Command structure.				12. PERSONNEL STRENGTH			PERMANENT		STUDENTS		SUPPORTED		TOTAL (9)	
				OFFICER (1)	ENLISTED (2)	CIVILIAN (3)	OFFICER (4)	ENLISTED (5)	OFFICER (6)	ENLISTED (7)	CIVILIAN (8)			
				a. AS OF 31 DEC 1972	21	194	1	0	0	146	497	0	859	
				b. PLANNED (End FY 1975)	13	146	1	0	0	160	530	0	850	
				13. INVENTORY										
				LAND	ACRES (1)	LAND COST (\$000) (2)	IMPROVEMENT (\$000) (3)	TOTAL (\$000) (4)						
a. OWNED	30	27	1,679	1,706										
b. LEASES AND EASEMENTS	0	0	0	0										
c. INVENTORY TOTAL (Except land rent) AS OF 30 JUNE 19 <del>72</del>				1,706										
d. AUTHORIZATION NOT YET IN INVENTORY				2,602										
e. AUTHORIZATION REQUESTED IN THIS PROGRAM				686										
f. ESTIMATED AUTHORIZATION - NEXT 4 YEARS				3,341										
g. GRAND TOTAL (c + d + e + f)				8,335										
14. SUMMARY OF INSTALLATION PROJECTS														
CATEGORY CODE NO. a	PROJECT DESIGNATION				TENANT COMMAND c	UNIT OF MEASURE d	AUTHORIZATION PROGRAM		FUNDING PROGRAM					
	PROJECT TITLE b						SCOPE e	ESTIMATED COST (\$000) f	SCOPE g	ESTIMATED COST (\$000) h				
723.10	CAMP ELMORE ENLISTED MEN'S DINING FACILITY				-	SF	4,840	374	4,840	374				
851.10	ROAD IMPROVEMENTS				-	SY	17,000	312	17,000	312				
						TOTAL	686			686				

445

## HEADQUARTERS FLEET MARINE FORCE, ATLANTIC, NORFOLK, VA., \$686,000

This activity manages the operations, training, administration, and logistics of assigned ground and aviation forces within the cognizance of the Atlantic Fleet Command structure.

Two projects totaling \$686,000 will provide this activity with an enlisted dining facility and road improvements.

*Status of funds*

Cumulative appropriations through fiscal year 1973.....	\$2, 648, 000
Cumulative obligations, Dec. 31, 1972 (actual).....	305, 929
Cumulative obligations, June 30, 1973 (estimated).....	1, 606, 929

## DESIGN INFORMATION

Project	Design cost	Percent complete, Apr. 1, 1973
Enlisted men's dining facility.....	\$18, 000	10
Road improvements.....	5, 000	78

Mr. DAVIS. Do you have a map here somewhere where you can show us the road improvements and explain the requirements for them?

General JANNELL. Yes, sir.

[The map was provided for the committee files.]

General JANNELL. The existing roads at the World War II vintage Camp Allen brig area are deteriorated and need repaving. This project provides the necessary roads, sidewalks, curbs, gutters, and street lighting. This chart shows the Camp Allen area within the naval complex at Norfolk, Va. As you can see, the road requirements, in green, are to service the BEQ which is in black, approved in fiscal 1973 and will also service the dining facility which is shown in green and re-

quested in the 1974 program. Other facilities planned for future programming are shown in orange.

Mr. DAVIS. What kind of paving are we talking about here?

General JANNELL. We are talking about bituminous paving.

Mr. DAVIS. And concrete gutter.

General JANNELL. Yes, sir.

Mr. DAVIS. Where is the nearest mess hall to Camp Allen at the present time?

General JANNELL. The nearest Navy mess is approximately 2 miles distant to Camp Allen.

Mr. DAVIS. Are there any questions?

Mr. McEWEN. On the storm sewers, are they separated from the sanitary sewers on the base?

General JANNELL. Yes; I am quite sure they are. I will provide that for the record.

Mr. McEWEN. These are new storm sewers to be constructed within this area?

General JANNELL. Yes, sir.

Admiral MARSCHALL. We will provide the details for the record, sir, but I am pretty sure it is a separate system. We have gone to separate systems practically everywhere.

[The information follows:]

The storm sewer line included in the road improvement project for Camp Elmore will be connected to the existing storm sewer line in the camp area which is separate from the sanitary sewer system.

MARINE CORPS SUPPLY CENTER, ALBANY, GA.

Mr. DAVIS. We will insert page II-49A in the record.

[The page follows:]

1. DATE 2 APR 1973		2. DEPARTMENT 1974		3. FY 1974 MILITARY CONSTRUCTION PROGRAM		5. INSTALLATION MARINE CORPS SUPPLY CENTER							
4. COMMAND OR MANAGEMENT BUREAU MARINE CORPS			5. INSTALLATION CONTROL NUMBER 8373-075		6. STATE/COUNTRY ALBANY, GEORGIA								
7. STATUS ACTIVE			8. YEAR OF INITIAL OCCUPANCY 1952		9. COUNTY (U.S.) DOUGHERTY		10. NEAREST CITY 7 MILES NORTHWEST TO ALBANY						
11. MISSION OR MAJOR FUNCTIONS Procure, maintain, repair, store and distribute all classes of supplies and equipment as assigned, and functions associated with Marine Corps Unified Management System. <u>Major Functions:</u> Operation of Central Repair Shop for overhaul and repair of Marine Corps operational and combat equipment Conduct such schools and training courses as directed Marine Corps East Coast Supply Center  <u>Major Activities Supported:</u> All Marine Corps East Coast and FMFLANT activities and other units as assigned				12. PERSONNEL STRENGTH			PERMANENT		STUDENTS		SUPPORTED		TOTAL
				OFFICER (1)	ENLISTED (2)	CIVILIAN (3)	OFFICER (4)	ENLISTED (5)	OFFICER (6)	ENLISTED (7)	CIVILIAN (8)	(9)	
				4. AS OF 31 December 1972	81	801	1,732	0	33	3	7	0	2,657
				5. PLANNED (End FY 1974)	144	1,119	2,680	0	33	3	7	0	3,986
				13. INVENTORY									
LAND		ACRES (1)	LAND COST (\$000) (2)		IMPROVEMENT (\$000) (3)		TOTAL (\$000) (4)						
4. OWNED		3,630	701		56,579		57,280						
5. LEASE AND EASEMENTS		0	0		0		0						
6. INVENTORY TOTAL (Except land rent) AS OF 30 JUNE 19 72							57,280						
7. AUTHORIZATION NOT YET IN INVENTORY							0						
8. AUTHORIZATION REQUESTED IN THIS PROGRAM							5,653 1/2						
9. ESTIMATED AUTHORIZATION - NEXT 4 YEARS							1,840						
10. GRAND TOTAL (c + d + e + f)							64,773						
14. SUMMARY OF INSTALLATION PROJECTS													
CATEGORY CODE NO. a	PROJECT DESIGNATION			TENANT COMMAND c	UNIT OF MEASURE d	AUTHORIZATION PROGRAM		FUNDING PROGRAM					
	PROJECT TITLE b					SCOPE e	ESTIMATED COST (\$000) f	SCOPE g	ESTIMATED COST (\$000) h				
610.10	ADMINISTRATION BUILDING			-	SF	172,700	5,204	172,700	5,204				
1/ INCLUDES \$449,000 FOR POLLUTION ABATEMENT													

448

## MARINE CORPS SUPPLY CENTER, ALBANY, GA., \$5,204,000

This activity procures, maintains, repairs, stores, and distributes all classes of supplies and equipment, as assigned. Operates the central repair shop for overhaul and repair of operational and combat equipment, and conducts specialized schools, as directed.

One project totaling \$5,204,000 will provide this center with an administration building to house the functions associated with the Marine Corps Unified Material Management System being relocated from the Marine Corps Supply Activity, Philadelphia.

*Status of funds*

Cumulative appropriations through fiscal year 1973-----	\$50,783,000
Cumulative obligations, Dec. 31, 1972 (actual)-----	50,568,477
Cumulative obligations, June 30, 1973 (estimated)-----	50,686,477

## DESIGN INFORMATION

Project	Design cost	Percent complete, Apr. 1, 1973
Administration building-----	\$249,792	0

## CLOSURE OF SUPPLY ACTIVITY IN PHILADELPHIA

Mr. DAVIS. Would you discuss the reasons for the closure of functions at Philadelphia and their transfer to Albany before we get into the specific request here?

General JANNELL. Primarily the reason for the closure of our facility in Philadelphia is to effect personnel reductions and significant cost savings.

We will also achieve significant side benefits by vacating very old buildings. There are 11 of these buildings built in 1908 in Philadelphia; and benefits accrue by achieving better utilization of many of our present facilities in Albany.

Mr. DAVIS. What savings do you anticipate?

General JANNELL. Our primary savings will result in personnel reductions. We expect these savings to be \$2.6 million a year. In addition, we will be avoiding about \$5 million for modernization and improvement to the present facility at Philadelphia. We will incur costs of \$5.2 million in military construction dollars which we are requesting here and \$5.9 million for a one-time cost of hiring and training our new employees, and for relocating our personnel and equipment from Philadelphia to Albany.

Mr. DAVIS. So that the immediate result will be greater cost, but looking down the road you do expect average annual savings of between \$2 and \$3 million, is that correct?

General JANNELL. That is correct.

Mr. DAVIS. Provide for the record the amount of construction which has been built at Philadelphia in the last 5 fiscal year programs. Also show the amount of construction which will be required and which will not be required as the result of this action.

[The information follows:]

## PHILADELPHIA CONSTRUCTION

During the past 5 fiscal years, one military construction project, P-010, in the amount of \$200,000 was requested and approved for this activity. This project, in the fiscal year 1969 program, accomplished a computer facilities expansion.

Relocation of the functions of the Marine Corps supply activity, Philadelphia, Pa., to Marine Corps Supply Center, Albany, Ga. will require \$5,204,000 in new construction. However, projects proposed for Marine Corps supply activity, Philadelphia, Pa. in the amount of \$4,924,000 will be avoided by the relocation.

#### ALTERNATIVES CONSIDERED

Mr. DAVIS. What other alternatives to the closure in Philadelphia did you consider when the decision was made?

General JANNELL. Relocation to Albany was only one of a number of alternatives which would give us the personnel reductions which we were seeking.

Consolidating Philadelphia and Albany functions at Camp Lejeune would have incurred major expenses in duplicating our Albany facilities. A move to vacated space in the Philadelphia Navy Yard would give us virtually no personnel reductions and therefore no advantage in staying at our present location.

The point is that only at Albany can we make the personnel reductions and achieve the necessary cost savings.

Mr. DAVIS. What is the nature and condition of the facilities at Philadelphia?

Would it be substantially cheaper to modernize these than to build new facilities at Albany?

How much have you spent on maintenance, and what is the maintenance backlog at Philadelphia?

General JANNELL. Sir, the original facilities at Marine Corps Supply Activity, Philadelphia, Pa., were constructed in 1908 as a clothing manufacturing and repair facility. The last building to be constructed in the complex was an administration building, finished 28 years ago in 1945. These buildings have undergone considerable altering through the years to adjust for changing functional requirements. Modernization of these buildings would require demolition of portions of some of the buildings within the complex in order that aged utility support systems could be upgraded to a level adequate to support the requirements of a modern, air-conditioned administrative facility. Labor costs relative to utility upgrading would constitute the primary expenditure cost involved in a modernization program. These labor costs, coupled with the demolition costs, render modernization of this complex, cost prohibitive. In fiscal year 1972, we spent \$410,000 on maintenance and repair at Marine Corps Supply Activity, Philadelphia, Pa., with another \$846,000 in backlog items not yet funded. The relatively low backlog results from the fact that facilities at Marine Corps Supply Activity, Philadelphia, are of such a nature that normal repair is not prudent and new construction is required.

[Discussion off the record.]

#### CONSOLIDATION PLANS

Mr. DAVIS. It has been alleged that the type of inventory control functions which you are moving from Philadelphia to Albany will not allow for substantial consolidation of personnel because they are unique and dissimilar from functions now being performed at Albany. Specifically what functions can you consolidate and what functions cannot be consolidated?

General JANNELL. The basic inventory control functions now being performed at Philadelphia will remain virtually unchanged after the relocation to Albany. Personnel savings, however, will come from consolidation of various supporting services, such as data processing, procurement, comptrollership, administration, and personnel services.

#### PERSONNEL PLANS

Mr. DAVIS. You indicated earlier that there would be some one-time costs for relocation, for recruitment and training as a result of the shift to Albany.

What success have you had in actually moving trained people there, and how many new people do you anticipate you are going to have to recruit and train?

General JANNELL. I realize it will not be an easy task to recruit and train employees; however, we believe the difficulty will be minimized by the long leadtime allowed, that is from the present to January 1976. Also, the availability of required skills through the DOD priority placement program. I would also like to make two very important additional points on this matter. First, we will have a great number of retirements coming up in Philadelphia over the next few years, and so would have many of the same recruiting and training problems. Second, we have been successful in the past in transferring our functions to Albany. Specifically the Transportation Voucher Certification Section with 24 people was moved about a year ago from my shop here in Washington to Albany. Only 2 of the 24 people in this section moved with this function. The rest of the billets were filled in Albany through local recruitment and training and I should add that the results have been most gratifying. We anticipate that about 20 percent of our civilian employees will relocate.

The figures that I have now are 289 employees at Philadelphia are eligible for retirement.

Mr. DAVIS. If they wish to go, how many people could be given an opportunity to transfer?

General JANNELL. Of the 1,132 civilian billets, we will reduce 184, leaving 948 billets to be moved to Albany, which could either be filled by relocation or rehiring at Albany.

#### RELOCATION OPTIONS

Mr. DAVIS. Once you made the decision to move from Philadelphia, did you examine options as to other installations that might have been used or could be practically used, other than Albany?

General JANNELL. Yes, sir; we did.

As you know, we have our two supply centers, one at Barstow and one at Albany. We have major bases at Camp Lejeune and Camp Pendleton. It seemed most desirable to move the functions of supply from Philadelphia to one of the supply centers. In this case either Albany or Barstow. In this case facilities at Albany are such that we could move there with the minimum construction of new facilities. The barracks, mess hall, civilian cafeteria, and other facilities in the Albany area, are entirely satisfactory. The only requirement there is essentially the Headquarters Building for the inventory control point that will be moved.

Mr. DAVIS. Does this transplanted task require a separate administration building in which to operate?

General JANNELL. Yes, sir. The present administration facilities there are not sufficient to take care of this function.

We will have a cost savings in the ADP area as we are putting this equipment in the present ADP facility at Albany.

#### WORKLOAD

Mr. DAVIS. Can you provide for the record the Albany workload, past, present, and projected, by repair, supply, and other support functions.

General JANNELL. Yes sir; we will provide that for the record. Permit me to add here, however, that our logistic support has pretty much stabilized as the Marine Corps has returned to peacetime strength and operations. We therefore expect that the present busy tempo of operations at Albany will continue indefinitely.

[The information follows:]

#### ALBANY WORKLOAD

##### SUPPLY

160,000 issues per month in fiscal years 1972 and 1973 and expected to continue at same rate.

##### REPAIR

14,000 items in fiscal year 1973; 22,000 planned for fiscal year 1974. Expected to continue in same range.

##### OTHER SUPPORT FUNCTIONS

Schools: Fiscal year 1973—322 students were enrolled in 18 classes.

Fiscal year 1974—474 students will be enrolled in 26 classes.

Fiscal year 1975—Same as fiscal year 1974.

Reserve training: Fiscal year 1973—Hosted 11 reserve units or detachments with personnel in 6 occupational fields and 21 MOS's. Same in fiscal year 1974 and fiscal year 1975.

Transportation vouchers: Fiscal year 1973—processed 103,448 vouchers. Paid 78,829 vouchers for a total of \$80.8 million.

Fiscal year 1974—Anticipate 30,000 voucher increase or 37 percent increase.

Fiscal year 1975—Same as fiscal year 1974.

##### SUPPLY ACTIVITIES MISSIONS

Mr. LONG. How many other supply activities are still operating? I understand you have supply centers on the east coast. Then you have what you call supply activities. I am trying to compare them. You are trying to consolidate the supply activity at supply centers.

General JANNELL. Not necessarily, sir.

We are making this move to effect cost savings. We do have our two supply centers and the supply activity which direct the activities of these supply centers. If I may, sir, could Colonel Mayer, who is from the Marine Corps Supply Department address this in more detail?

Colonel MAYER. The supply activity runs our central system. We have four remote storage activities, so the supply activity that we are moving runs this whole system. We are just now locating it with one of our remote storage activities where we can get this consolidation.

Mr. LONG. The supply activity is above?

Colonel MAYER. Yes, sir.

Mr. LONG. The center is subordinate to that.

Colonel MAYER. Yes, sir. They handle the material there. All the records are run at the central point.

Mr. LONG. You say there are four supply centers. How many supply activities are there?

Colonel MAYER. We have the one supply activity which we call the activity, which is at Philadelphia.

Mr. LONG. That is the only one you have anywhere in the country?

Colonel MAYER. That serves that purpose, yes. Then we have four remote storage activities, where they actually hold the material. At Philadelphia we just hold the records.

Mr. LONG. What I am trying to get at is this: How many things do you have floating around the country which could be called storage or supply, or what have you, that could be consolidated or moved now to Albany, or could be so moved at some later date?

Colonel MAYER. Our supply centers are Albany and Barstow. We have minor functions at each of our major bases.

Mr. LONG. I want to know if there is anything else around the country for which you could do as you are doing here at Philadelphia, move to Albany.

Colonel MAYER. No, sir. Each of the other functions we have are directly related to the customers supported on the base and could not be moved.

Mr. LONG. You have no intention of coming back next year and asking that something else be located there?

Colonel MAYER. No, sir.

#### MARINE CORPS AIR STATION, BEAUFORT, S.C.

Mr. LONG. We will insert page II-50 in the record.

[The page follows:]

1. DATE 19 FEB 1973		2. DEPARTMENT NAVY		3. INSTALLATION FY 1974 MILITARY CONSTRUCTION PROGRAM		MARINE CORPS AIR STATION										
4. COMMAND OR MANAGEMENT BUREAU MARINE CORPS			5. INSTALLATION CONTROL NUMBER 8139-060		6. STATE/COUNTRY BEAUFORT, SOUTH CAROLINA											
7. STATUS ACTIVE		8. YEAR OF INITIAL OCCUPANCY 1943		9. COUNTY (U.S.) BEAUFORT		10. NEAREST CITY 46 MILES SOUTHWEST TO SAVANNAH, GEORGIA										
11. MISSION OR MAJOR FUNCTIONS  To maintain and operate facilities and provide services and material to support operations of a Marine Aircraft Wing or units thereof and other activities and units as designated by the Commandant of the Marine Corps in coordination with the Chief of Naval Operations.  <u>Major Activities Supported:</u> 2 Fighter-Attack Groups				12. PERSONNEL STRENGTH				TOTAL								
								PERMANENT		STUDENTS		SUPPORTED				
				OFFICER (1)		ENLISTED (2)	CIVILIAN (3)	OFFICER (4)	ENLISTED (5)	OFFICER (6)	ENLISTED (7)	CIVILIAN (8)	(9)			
				a. AS OF 31 DEC 1972				55	445	393	0	0	381	3,563	25	4,863
				b. PLANNED (End FY 1975)				55	423	326	30	140	321	2,925	0	4,220
				13. INVENTORY												
LAND		ACRES (1)		LAND COST (\$000) (2)		IMPROVEMENT (\$000) (3)		TOTAL (\$000) (4)								
a. OWNED		6,542		2,698		70,145		72,843								
b. LEASES AND EASEMENTS		33* - 110#		(0* - 26#)		0		26								
c. INVENTORY TOTAL (Except land rent) AS OF 30 JUNE 1972										72,869						
d. AUTHORIZATION NOT YET IN INVENTORY										5,174						
e. AUTHORIZATION REQUESTED IN THIS PROGRAM										126						
f. ESTIMATED AUTHORIZATION - NEXT 4 YEARS										2,299						
g. GRAND TOTAL (c + d + e + 0)										80,468						

14. SUMMARY OF INSTALLATION PROJECTS							
PROJECT DESIGNATION				AUTHORIZATION PROGRAM		FUNDING PROGRAM	
CATEGORY CODE NO. a	PROJECT TITLE b	TENANT COMMAND c	UNIT OF MEASURE d	SCOPE e	ESTIMATED COST (\$000) f	SCOPE g	ESTIMATED COST (\$000) h
116.15	AIRCRAFT CORROSION CONTROL FACILITY	-	EA	2	126	2	126

## MARINE CORPS AIR STATION, BEAUFORT, S.C., \$126,000

This jet air station supports three fighter squadrons, three attack squadrons, and three aviation support squadrons.

One project totaling \$126,000 will provide an aircraft corrosion control facility for approximately 106 assigned aircraft.

*Status of funds*

Cumulative appropriations through fiscal year 1973.....	\$53,196,000
Cumulative obligations, December 31, 1972 (actual).....	49,057,952
Cumulative obligations, June 30, 1973 (estimated).....	50,496,298

## DESIGN INFORMATION

Project	Design cost	Percent complete Apr. 1, 1973
Aircraft corrosion control facility.....	\$5,456	36

## SUPPORT OF F-14

Mr. LONG. Will the facility you are requesting be adequate to support the F-14?

General JANNELL. Yes, this facility will support all the operational fixed wing aircraft in our present inventory and the F-14. The primary function of this facility is to accumulate the liquid solvent used in cleaning aircraft and properly dispose of it without local contamination.

## MARINE CORPS RECRUIT DEPOT, PARRIS ISLAND, S.C.

Mr. LONG. We will insert page II-52 in the record.

[The page follows:]

1. DATE 19 FEB 1973		2. DEPARTMENT NAVY		3. INSTALLATION MARINE CORPS RECRUIT DEPOT									
4. COMMAND OR MANAGEMENT BUREAU MARINE CORPS			5. INSTALLATION CONTROL NUMBER 8600-610		6. STATE/COUNTRY PARRIS ISLAND, SOUTH CAROLINA								
7. STATUS ACTIVE		8. YEAR OF INITIAL OCCUPANCY 1883		9. COUNTY (U.S.) BEAUFORT		10. NEAREST CITY 43 MILES SOUTH TO SAVANNAH, GEORGIA							
11. MISSION OR MAJOR FUNCTIONS Provide for reception and recruit training of enlisted personnel upon their first entry into the Marine Corps.  <b>Major Functions:</b> East Coast Recruit Training Activity Conduct rifle marksmanship training for Marine Corps officers and enlisted personnel and for personnel of other services, as requested Conduct Reserve Training as directed Conduct schools for Sergeant Majors, Administrative Chief, Recruiters, Drill Instructors, Field Musics and others assigned				12. PERSONNEL STRENGTH		PERMANENT		STUDENTS		SUPPORTED		TOTAL (9)	
				OFFICER (1)	ENLISTED (2)	CIVILIAN (3)	OFFICER (4)	ENLISTED (5)	OFFICER (6)	ENLISTED (7)	CIVILIAN (8)		
				a. AS OF 31 DEC 1972	249	2,275	542	0	99	1	6,482	0	9,648
				b. PLANNED (End FY 1975)	262	2,062	569	40	470	0	7,700	0	11,103
				13. INVENTORY									
LAND		ACRES (1)		LAND COST (\$000) (2)		IMPROVEMENT (\$000) (3)		TOTAL (\$000) (4)					
a. OWNED		8,381		415		43,214		43,629					
b. LEASES AND EASEMENTS #		0* - 25#		0* - 2#		2* - 0#		4					
c. INVENTORY TOTAL (Except land rent) AS OF 30 JUNE 19 72								43,633					
d. AUTHORIZATION NOT YET IN INVENTORY								11,221					
e. AUTHORIZATION REQUESTED IN THIS PROGRAM								2,696 1/					
f. ESTIMATED AUTHORIZATION - NEXT 4 YEARS								5,405					
g. GRAND TOTAL (c + d + e + f)								62,955					
14. SUMMARY OF INSTALLATION PROJECTS													
PROJECT DESIGNATION				TENANT COMMAND c	UNIT OF MEASURE d	AUTHORIZATION PROGRAM		FUNDING PROGRAM					
CATEGORY CODE NO. a	PROJECT TITLE b					SCOPE e	ESTIMATED COST (\$000) f	SCOPE g	ESTIMATED COST (\$000) h				
722.11	BACHELOR ENLISTED QUARTERS			-	SF	90,432	2,580	90,432	2,580				
1/ INCLUDES \$116,000 FOR POLLUTION ABATEMENT													

456

## MARINE CORPS RECRUIT DEPOT, PARRIS ISLAND, S.C., \$25,580,000

The recruit depot provides for reception and recruit training of enlisted personnel upon their first entry into the Marine Corps; provides schools to train enlisted personnel as sergeant majors, administrative chiefs, recruiters, drill instructors and field musics; conducts reserve training, rifle marksmanship training for Marine officers and enlisted personnel in the Southeastern area, and for personnel of other services, as requested.

The program for this activity consists of one project, at a cost of \$2,580,000 for a new bachelor enlisted quarters for 576 E-2 through EE-4 enlisted personnel, permanent party.

*Status of funds*

Cumulative appropriations through fiscal year 1973.....	\$27,382,000
Cumulative obligations, December 31, 1972 (actual).....	26,040,724
Cumulative obligations, June 30, 1973 (estimated).....	28,408,066

## DESIGN INFORMATION

Project	Design cost	Percent complete, Apr. 1, 1973
Bachelor enlisted quarters.....	\$17,516	1

*Current bachelor enlisted status at MCRD, Parris Island*

1. Effective BEQ requirement.....	8,676
2. Adequate assets.....	3,904
Installation.....	3,879
Community.....	25
3. Deficit.....	4,772
4. Fiscal year 1974 project.....	576
5. Remaining deficit after fiscal year 1974.....	4,196

## RECRUIT TRAINING LEVELS

Mr. LONG. Can you provide for the record, your past, present, and projected recruit training levels?

General JANNELL. Yes, sir, I will provide that for the record.

Mr. LONG. Also, indicate the capacity of your recruit depots and to what extent this capacity represents permanent facilities.

[The information follows:]

## RECRUIT LEVELS

Fiscal year: <sup>1</sup>	Recruit levels	Annual loading	Average on board	Peak
1964.....		37,659	9,390	
1965.....		33,332	8,330	
1966.....		78,245	19,550	
1967.....		72,787	18,200	
1968.....		89,138	22,200	
1969.....		81,791	20,400	
1970.....		67,640	16,900	
1971.....		54,851	13,700	15,200
1972.....		56,425	14,100	16,100
1973.....		59,285	14,800	21,500

<sup>1</sup> Estimated input for fiscal year 1974 is 60,000 (51,800 regular and 8,200 reserve).

Note: June 1973 figures for reserves not yet included. Based on floor space required by standards of adequacy for billiting purposes, Marine Corps Recruit Depot, Parris Island, S.C., has capacity for 8,611 recruits of which 6,863 or 79.7 percent would be in permanent facilities. Comparable figures for Marine Corps Recruit Depot, San Diego, Calif., including the Weapons Training Battalion at Camp Pendleton, Calif., are 7,967 total capacity of which 6,564 or 82.4 percent would be in permanent facilities.

MARINE CORPS AIR STATION, YUMA, ARIZ.

Mr. LONG. We will insert page II-54 in the record.  
[The page follows:]

1. DATE 19 FEB 1973		2. DEPARTMENT NAVY		3. FY 1974 MILITARY CONSTRUCTION PROGRAM		8. INSTALLATION MARINE CORPS AIR STATION					
4. COMMAND OR MANAGEMENT BUREAU MARINE CORPS			5. INSTALLATION CONTROL NUMBER 8139-950		6. STATE/COUNTRY YUMA, ARIZONA						
7. STATUS ACTIVE		9. YEAR OF INITIAL OCCUPANCY 1941		10. COUNTY (U.S.) YUMA		10. NEAREST CITY 5 MILES TO YUMA					
11. MISSION OR MAJOR FUNCTIONS Maintain and operate facilities and provide services and material to support operations of a Marine Aircraft Wing, or units thereof, and other activities and units as designated by the Commandant of the Marine Corps in coordination with the Chief of Naval Operations. <u>Major Units Supported:</u> One Marine Combat Crew Readiness Training Group One Anti-Aircraft Missile Battalion One Marine Air Control Squadron One Marine Air Traffic Control Unit Four Rotational Squadrons (Homeported elsewhere) deployed for Weapons Training				12. PERSONNEL STRENGTH		13. INVENTORY					
				PERMANENT		STUDENTS		SUPPORTED			
		OFFICER (1)	ENLISTED (2)	CIVILIAN (3)	OFFICER (4)	ENLISTED (5)	OFFICER (6)	ENLISTED (7)	CIVILIAN (8)	TOTAL (9)	
a. AS OF 31 DEC 1972		247	2,355	489	69	1	45	215	0	3,421	
b. PLANNED (End FY 1978)		230	1,862	550	174	720	145	1,197	0	4,878	
		LAND		ACRES (1)	LAND COST (\$000) (2)	IMPROVEMENT (\$000) (3)		TOTAL (\$000) (4)			
a. OWNED		2,237		970		53,257		54,227			
b. LEASES AND EASEMENTS #		1,726* - 230#		(0* - 51#)		702* - 0#		753/			
c. INVENTORY TOTAL (Exclpt land rent) AS OF 30 JUNE 19 72								54,980			
d. AUTHORIZATION NOT YET IN INVENTORY				(EXCLUSIVE OF FAMILY HOUSING \$		0)		12,044			
e. AUTHORIZATION REQUESTED IN THIS PROGRAM				(EXCLUSIVE OF FAMILY HOUSING \$		0)		4,790			
f. ESTIMATED AUTHORIZATION - NEXT 4 YEARS				(EXCLUSIVE OF FAMILY HOUSING \$8,525,000)				18,388			
g. GRAND TOTAL (c + d + e + f)								90,202			
14. SUMMARY OF INSTALLATION PROJECTS											
PROJECT DESIGNATION				TENANT COMMAND		UNIT OF MEASURE		AUTHORIZATION PROGRAM		FUNDING PROGRAM	
CATEGORY CODE NO. a	PROJECT TITLE b			c	d	SCOPE e	ESTIMATED COST (\$000) f	SCOPE g	ESTIMATED COST (\$000) h		
740.23	COMMISSARY			-	SF	26,200	999	26,200	999		
911.10	LAND ACQUISITION			-	AC	129	635	129	635		
921.10	AVIATION INSTALLATION COMPATIBLE USE ZONE			-	AC	14,000	3,156	-	-		
						TOTAL	4,790			1,634	

459

## MARINE CORPS AIR STATION, YUMA, ARIZ., \$1,634,000

This station provides the primary aerial weapons training base for west coast Navy and Marine Corps fighter/attack squadrons.

Two projects totaling \$1,634,000 will provide this station with a commissary and the purchase of 129 acres of land for future ordnance facilities. This program also provides authorization to acquire restrictive land easements on the periphery of this vital air station to protect against horizontal and vertical encroachment and sound pollution. This project will be accomplished by exchange of other Federal lands.

*Status of funds*

Cumulative appropriations through fiscal year 1973-----	\$36,196,000
Cumulative obligations, Dec. 31, 1972 (actual)-----	30,638,632
Cumulative obligations, June 30, 1972 (estimated)-----	32,317,157

## DESIGN INFORMATION

Project	Design cost	Percent complete, Apr. 1, 1973
Commissary-----	\$44,341	22
Land acquisition-----	1,000	100

## COMMISSARY

Mr. LONG. What are you currently using for a commissary facility here?

General JANNELL. The current commissary is a temporary wood frame building originally erected in 1943 as a subsistence building. I can attest personally to the need for replacement of this structure which I viewed this past January.

Mr. LONG. What are your projected sales, and to what extent do these figures include sales to retired personnel?

General JANNELL. Based on the latest available information, average monthly sales during 1977 are estimated at \$253,000 per month. This sales volume equates to the requirement for maximum facility size of 26,200 square feet. Projected monthly sales are planned to increase at Yuma similar to the increase experienced at Twenty-Nine Palms in 1970 after opening a new store at that location. The impact of retired personnel on our projected sales represents approximately 7 percent of the total \$253,000 projection.

Mr. LONG. How do you estimate that? How do you know what the retired personnel buy?

General JANNELL. By conducting surveys, sir.

Mr. LONG. What do you mean by survey?

Do you have figures on the value of everything that every customer buys?

General JANNELL. I don't know the content of the survey, Dr. Long. If you would like, sir, I can get additional information.

Mr. LONG. Does anybody here know?

General JANNELL. I do not think so, sir.

## VALIDITY OF COMMISSARY STATISTICS

Mr. LONG. I think we are entitled to know that. This whole question of commissary sales and the extent to which retired people are living on what many people feel is military welfare, while at the same

time depriving local businessmen, is very important. I do not think we should take a figure of 7 percent without knowing what it is.

Frankly, General, I do not think you should come here with figures which are just off the cuff. I think your figures should be hard figures which you can defend. I have spent my life with statistics, and I heartily subscribe to the notion that there are liars, damned liars, and statistics.

There are seven books utilizing statistics that I know of, and there are millions of pitfalls.

I am deeply suspicious of any statistic that is ever put forth.

General JANNELL. It is my understanding this committee sent representatives down to Yuma to take a look at that commissary.

Some of the information we have was information verified by that committee and unfortunately I haven't the information at hand right now.

[The information follows:]

#### COMMISSARY SURVEY

The Marine Corps conducts commissary store surveys to accumulate data to comply with the certification requirements as set forth in the Department of Defense Appropriation Act. An informal board of officers is appointed within each command to conduct a survey of the commissary store. Membership on the board includes one senior officer versed in personnel matters, one supply officer and one medical officer or veterinary officer. Every effort is made to insure a fair and impartial survey that can be substantiated under the most searching analysis in accordance with instructions promulgated by the Commandant of the Marine Corps. A complete report of each survey is submitted to the Commandant. The last survey conducted by the Marine Corps Air Station, Yuma, Ariz., in September 1972, documents the following commissary store customer population data :

	Number	Percent
Total commissary store patrons.....	2,618	100
Assigned to quarters on the installation.....	679	26
Assigned but residing in adjacent communities.....	674	26
Other active-duty personnel (students and other armed services).....	965	37
Retired, totally disabled veterans, widows and other nonactive-duty personnel.....	300	11

The customer population data is obtained by actual customer count at the commissary store patron identification desk, by either the military uniform, or in the case of dependents, the Uniform Services Identification and Privilege Card is the source of identification. The patron count is then compared with personnel records maintained by the activity, medical records on families receiving medical treatment in the Yuma area and personal data entered on the reverse of personal checks cashed at the commissary store. The numbers of retired military families are also verified with records maintained by the local chamber of commerce.

Since the September 1972 Marine Corps Air Station commissary store survey at Yuma documents that 11.4 percent of the total customer population in an other than active duty status, the following breakdown is considered to be accurate based on known experience :

	Number	Percent
Military retired.....	200	7.6
Military widows.....	30	1.2
Totally disabled veterans.....	10	.3
Clubs and other nonappropriated fund dining facilities represent approximately.....	60	2.3

Based on all available statistical data, it is concluded that the retired military families in the Yuma area represent approximately 7 percent of the total customer population. Experience tells us that the average retired military family is still relatively young and usually has dependent children residing at home. This means that for several years after retirement their food requirements are approximately the same as the requirements of those families on active duty. For this reason, it is a reasonable estimate that military retired personnel purchased food amounting to approximately 7 percent of the total volume at Yuma during the period covered by the indicated survey.

Mr. LONG. I would suggest that for the future, when you come in here with statistics, you come in with very good, solid reasons for making them, and that you have people here who are knowledgeable.

#### UNIT COST

Mr. McEWEN. On the cost of this commissary, do I understand correctly from the justification page that 26,200 square feet are involved?

General JANNELL. Yes, sir.

Mr. McEWEN. At a cost of \$999,000. That would be in excess of \$40 a square foot. Is that correct?

General JANNELL. It is a little under \$40.

Admiral MARSCHALL. It is a unit cost of \$34.35 a square foot.

Mr. McEWEN. On the commissary?

Admiral MARSCHALL. On the commissary store itself. Added to that, of course, you have the supporting facilities which we add separately and you do get a different square foot figure when you include those.

Mr. LONG. Are they included? I think the gentleman from New York is right. If you divide 26,000 square feet into \$1 million, you have roughly \$40 a square foot.

Admiral MARSCHALL. The reason I say these are separately listed is so that you can compare like things. If you look at the 1,391, Dr. Long, you can see the total square foot figure is at a value of \$900,000, and these supporting facilities such as the electric substation, water distribution line, sanitary lines, parking area, site improvement, and demolition of existing buildings all add up to a figure of \$99,000. You are right. It is going to cost about \$40 a square foot total, but for purposes of extracting the cost of the building itself, we list the sales store itself separately.

Mr. LONG. Isn't it true that we figure all buildings that way? We just take the total cost and divide by the number of square feet? We are constantly being hit over the head with what the capitol improvements will cost per square foot and what the Rayburn Building costs and things of that sort.

Admiral MARSCHALL. The gentleman is absolutely correct and we provide this figure for the commissary store itself as a comparative item for comparing it to other things.

Mr. McEWEN. I was on the District of Columbia Subcommittee and Mr. Davis was on there for 8 years. We went into building costs in the District and we certainly included utilities in the cost of the building per square foot.

Mr. DAVIS. That is my recollection.

Mr. McEWEN. I think site improvement was included and land acquisition.

I turn back to II-49-B, the administration building at Albany, Ga. That is given at 172,700 square feet and a cost of \$5.2 million. That is about \$30 a square foot.

As I say, I question these expenditures in the commissaries. I know how people in the service feel about it being one of the fringe benefits, but they seem extremely costly in relation here to an administration building—I assume this is a permanent building at Albany, Ga. It will be air-conditioned and have all the modern amenities for people working in it and yet it comes out substantially less than this commissary. The commissary is costing a third more.

Admiral MARSCHALL. You are talking about economy of scale when you are talking about the comparison. You are talking about a 26,200 square foot building versus a 172,000 square foot building. There is an economy of scale there. The commissary store itself will have different things from an administration building. Probably more mechanical and electrical than the administration building would, particularly of a specific type. Walk-in refrigerators, permanent refrigerators, display cases, and things of that sort.

Mr. McEWEN. Do these figures include the equipping of these buildings?

#### BUILDING COST OF COMMISSARIES VERSUS COMMERCIAL STORES

Admiral MARSCHALL. To some extent, sir. Commissaries—if you want to compare them with Safeway stores, for example, include considerably more than the average Safeway store as far as what we put into them in the way of capital cost.

Safeway, for example, just using them as an example—it could be any one of the chains—generally puts up a structure and tries to do it for as reasonable a cost as possible, as any prudent businessman would do.

Mr. LONG. The Navy doesn't have to worry about things like that. Admiral MARSCHALL. Yes we do, but it is a different form of financing.

For example, we have a little breakdown here which the commander can speak to.

Commander KIRKPATRICK. In the Safeway construction, normally the builder constructs only the shell and then the user, or owner, would come in and put in the partitions, plumbing, heating, and ventilating. I understand there are tax advantages in doing it that way.

Then, of course, he would also put in his built-in equipment, his meat rails, his hoists and any structural supports for these. Of course, in our commissary we include all of that as built-in cost.

The display cases, cash registers, and carts are not included in the total Milcon construction price nor are they included in the Safeway investment price.

Admiral MARSCHALL. You might say, Mr. McEwen, this is one place where we are more explicit than the private sector in stating our case because of the financing arrangement.

General JANNELL. We have sizable storage area for our products, a larger cold storage area than in many of the local stores. They have central warehousing which we don't use. Safeway will have a central warehouse here in Washington and make daily trips to their local Safeway stores, where we in a place like Yuma, will have to make a buy that will last 2 weeks or more and provide storage for it.

We have a sizable storage area that the local stores won't have.

Mr. LONG. Do you have figures on what a commercial concern would spend for a building, with or without these various factors you are

talking about—figures, in other words, which make it as comparable as possible.

Admiral MARSCHALL. The shell only, for a supermarket, averages around \$20 per square foot.

Mr. LONG. Compared with \$40 here.

Admiral MARSCHALL. \$34.

Mr. LONG. Supply for the record figures as comparable as you can get them so that we have a basis for comparison.

I have an uneasy feeling a lot of this is done the way supermarket prices are done for the consumer. It is almost impossible for the poor shopper to figure out the price per pound for the product.

[The information follows:]

#### COMMERCIAL VERSUS COMMISSARY COSTS

The below unit cost amounts are provided to permit comparison of the Navy's unit cost for the proposed commissary at the Marine Corps Air Station, Yuma, Ariz. with similar type construction for commercial stores. The unit costs have been compiled including expenditures of funds from all sources to develop a ready-to-operate turn-key structure with all appurtenances excluding food on the shelves. Corrections for prevailing labor and material costs in the geographical area of Yuma have also been made.

<i>Source of cost estimates</i>	<i>Unit cost per square foot</i>
Commissary at MCAS Yuma.....	\$43.36
Safeway food stores.....	39.82
Giant food stores.....	39.67
Atlantic and Pacific food stores.....	36.11
Grand Union Supermarkets.....	36.11
16 commercial food stores as reported by the Dodge Construction Cost Digest .....	41.29

Mr. LONG. This commissary involves a little over half an acre of building space?

Admiral MARSCHALL. Yes, sir.

Mr. LONG. You are acquiring 129 acres, which is almost 250 times the size of the store. Why do you have to have such a huge piece of land for this commissary?

General JANNELL. The two are not related.

Mr. LONG. At \$4,000 an acre, which is not cheap.

General JANNELL. The two are not related, sir. This particular land we want to acquire is located away from the main complex—and we have a chart here available to show where that land is. This is for a missile assembly site, sir.

Mr. LONG. The land acquisition has nothing to do with the commissary?

Admiral MARSCHALL. That is correct, sir.

Mr. LONG. You are putting the commissary right on land which you already own?

General JANNELL. Yes, sir. Right in the center part of the base, sir.

Mr. DAVIS. According to our committee report, you have scaled this project down from over \$1.5 million to about \$1 million?

General JANNELL. Yes, sir.

Mr. DAVIS. Did you get your design from your A. & E. contractor at the end of June?

General JANNELL. I am sorry, sir, I don't know.

Mr. DAVIS. The staff report said that on June 29, 100-percent-complete design is due from the architectural engineering contractor. General JANNELL. I don't know.

POSSIBILITY OF CONSTRUCTION USING SURCHARGE

Mr. DAVIS. Check it out.

Is this the only commissary requested by the Marine Corps this year?

General JANNELL. Yes, sir, in this program. This is the only one we have ever requested.

Admiral MARSCHALL. With respect to your previous questions, the 30-percent plans for this commissary were just submitted to our western division in the last week or so. At the 30-percent stage, we have just about all the essentials in the design completed to provide us with a very good estimate of cost, so we have verified this cost.

General JANNELL. Mr. Davis, I would like to mention this is the only commissary we have requested of this committee for the Marine Corps during the last 30 years.

Mr. Long. For the entire Marine Corps?

General JANNELL. Yes, sir.

Mr. McEWEN. You do have commissaries?

General JANNELL. Yes, sir.

Mr. McEWEN. How were they constructed?

General JANNELL. The Marine Corps operates 12 main commissary stores, 1 branch store and 5 annex stores all located at major Marine Corps activities. With exception of two, our commissary stores are housed in pre-World War II buildings originally constructed with appropriated funds as messhalls or warehouses. Due to the Marine Corps priority of other building needs, we have been unable to construct new store facilities under the military construction program during the past 30 years.

As a means of continuing to provide reasonably adequate store facilities, the Marine Corps has improved facilities using surcharge funds (profits). Since 1968, the Marine Corps has invested \$3.575 million dollars of surcharge funds in our commissary store facility improvement program. All of the improvements have been renovations or additions to existing buildings except for one new sales store at Twentynine Palms, Calif., and one new facility at Quantico, Va. Our very austere building improvement program has resulted in maintaining reasonably adequate buildings at a minimal cost to the customer without increasing the surcharge rate.

Mr. McEWEN. These funds did not necessarily come out of the funds of each post?

General JANNELL. That is correct.

Mr. McEWEN. Has this to your knowledge been done in any of the other services?

General JANNELL. Yes, sir.

Mr. McEWEN. The Navy, Admiral?

Admiral MARSCHALL. Yes, sir.

Mr. McEWEN. Have commissaries been built out of commissary funds?

Admiral MARSCHALL. There has been a considerable amount of construction in existing buildings for commissaries. As far as the structure itself is concerned, I am not sure, but I know we have approved many alterations in structures for commissaries with commissary funds.

Mr. LONG. We would like to have that for the record.

[The information follows:]

#### USE OF COMMISSARY FUNDS

Navy records show that only one complete commissary has been authorized from nonappropriated funds to date. This commissary is to be located at the Navy Supply Corps School, Athens, Ga., and was approved for construction during April 1973. However, the improvement, conversion or addition to existing structures for commissary use has been underway since the use of nonappropriated funds for commissaries was started in 1926.

The magnitude of major structure improvement work for commissary use in recent years is as follows:

Fiscal year	Number of improvement projects	Total cost
1965	7	\$2,250,000
1966	5	300,000
1967	10	1,600,000
1968	11	1,890,000
1969	6	960,000
1970	8	400,000
1971	10	2,600,000
1972	10	2,800,000
1973	9	2,500,000

Mr. McEWEN. I have no argument with commissaries being provided for military personnel, but I do question, with the changes we have made in pay and allowances for the services, using appropriated funds to build commissaries. A cooperative is essentially a nonprofit cooperative. Yes, just as the farmers in my district can form a cooperative or anybody else can, I have no argument with the services having commissaries, but when it comes to taking appropriated funds for the construction of commissaries, particularly with the other needs for construction that all of our services have, I seriously question it.

Mr. LONG. Would the gentleman yield?

Mr. McEWEN. Yes.

#### AVAILABILITY OF COMMISSARY FUNDS

Mr. LONG. If you have built all your other commissaries out of commissary funds, why not this one? Why break a good record?

General JANNELL. Because the requirements overshadow the amount of money available to do this, sir. The commissary at Yuma, is sorely needed. We also considered that, in our judgment it should be done with appropriated funds.

Mr. LONG. Can't you wait until you have accumulated funds from elsewhere to build this?

How are people struggling along now?

General JANNELL. The present facility they are using is quite small. It is inadequate. The building is in a terribly rundown condition. Certainly they are using it and they are going to use it until the completion of a new commissary.

Mr. LONG. I was going through the southern part of my district the other day looking at most industrial business structures and it occurred to me as I looked at them, not one of them would suit the military. Every one of them would be torn down and rebuilt. These are businesses that have been and will be going on for years and years. This is true of the average small industrial business. They just try to get along with unsatisfactory facilities.

You know, it is nice to have, but you won't make money by building new ones. So why can't you go along a little while, as the rest of the public has to do, until you have accumulated money from commissary funds?

Mr. McEWEN. How much money do you have in this commissary reserve fund?

General JANNELL. I will have to provide that for the record.

[The information follows:]

As of April 30, 1973, the Marine Corps Commissary Reserve Fund had an uncommitted balance of \$346,983.

#### USE OF RESERVE FUND

Mr. McEWEN. What is this reserve fund for?

General JANNELL. The reserve fund is to make improvements in the commissary system. It is to buy new equipment. The net profit in our commissaries runs approximately 4 percent and that 4 percent is quite low. It will take some time to accumulate enough profit reserve in order to build a new facility. In the meantime the facilities that we have, a lot of them are quite old, and they require additional cold storage area, additional improvements and our profits are such that we cannot build this new commissary.

Mr. McEWEN. The 4-percent net profit goes into this commissary reserve fund; is that correct?

General JANNELL. Yes, sir.

Mr. McEWEN. Is that 4-percent net, after allowing for the depreciation of the facility or is that strictly an operating base?

General JANNELL. This doesn't consider depreciation. This is approximately 4-percent profit.

Mr. McEWEN. Income to the commissary over actual cost of goods, wages, utilities, whatever the operating costs are?

General JANNELL. That is correct.

Mr. LONG. Who pays the salaries of the people working in the commissary?

General JANNELL. These are appropriated funds.

Mr. LONG. So that this supermarket is in a position of having all of its employees paid for out of appropriated funds?

General JANNELL. That is correct.

Mr. LONG. And you still only make 4-percent profit?

General JANNELL. That is correct.

Mr. LONG. I see somebody shaking his head. Is there some dispute about this?

Commander KIRKPATRICK. We have some nonappropriated funds in our Navy commissaries, but we would have to provide a breakdown. We don't have that information with us.

## PERSONNEL PAID FROM APPROPRIATED FUNDS

General JANNELL. Our people are paid by appropriated funds in the Marine commissaries. The Navy commissary system is organized a little differently.

Mr. LONG. That is the main cost of running your business; isn't it?

General JANNELL. That is right.

Mr. LONG. You get that free and still you only get 4-percent profit and you are having trouble piling up funds to buy a new building?

General JANNELL. Yes, sir. We do not want to get more profit than that, sir. We would like to hold the cost down as low as we can. We want to operate on minimum profits.

Mr. LONG. Why shouldn't the employees be paid for out of commissary funds? You are building the buildings out of commissary funds in most cases.

Men aren't fighting for their country when they are selling commodities over a counter. Why should this be part of the military defense budget?

General JANNELL. I can't answer that question, sir.

Mr. LONG. Where is the money going if you only make a 4-percent profit with the Government paying all of your payroll?

General JANNELL. It is purposely designed to only make a 4-percent profit, sir. We buy our goods at a certain price and the markup is such that it is only 4 percent and that 4 percent pays our mandatory operating expense cost.

Mr. LONG. That raises this question: If you haven't enough markup, why don't you raise your prices somewhat? You are still a pretty good bargain for the people patronizing the supermarket. Why don't you raise your prices a little bit so that you can pile up the funds?

## SOURCE OF FUNDS

General JANNELL. The purpose of the commissary is not to make money, Dr. Long. It is to provide goods for the military patron at the lowest practicable price. We have been getting along with the 4-percent profit, being able to upgrade our commissary facilities, being able to improve them and putting in new equipment.

In other words, some of the equipment that will go in this particular commissary at Yuma will be paid for out of these commissary reserve funds.

Mr. LONG. That is only 10 percent of the cost.

General JANNELL. We have been able to get along with that.

Mr. LONG. Isn't that true; it is only 10 percent of the cost and 90 percent is the building?

Admiral MARSCHALL. It is closer to about 25 percent of the cost.

Mr. LONG. You have \$900,000 for the shell and you have \$99,000 for the parking area, the electric substation, water distribution, sewage, and so on. That is about 10 percent.

Admiral MARSCHALL. This can be called an even million dollars. This commissary eventually is going to cost about \$1.25 million.

Mr. LONG. Out of appropriated funds?

Admiral MARSCHALL. No. That is the point he is making.

Mr. LONG. The fact remains that the overwhelming bulk of this commissary is going to be appropriated at the same time that the overwhelming bulk of your costs, which are for the payroll, are being paid for out of appropriated funds. This is a fabulous subsidy. It lies within your power to change the rules here. There is no reason why you can't raise the prices of your store somewhat in order to have a somewhat larger accumulation than 4 percent in your commissaries around the country, so you can pay for this yourself. They are still getting a pretty good proposition; isn't that right?

General JANNELL. I think it is all relative, Dr. Long.

Mr. LONG. At the same time, you see, keep in mind, we have people out in the economy trying to earn a living. Business people try to earn a living while paying for their own stores, paying for all their equipment and all; and they don't have such subsidies. Besides, your prices are way below what a businessman has to sell for.

For what purpose do you intend to acquire land at a cost of \$635,000?

#### LAND ACQUISITION NEED

General JANNELL. The acquisition of this land will provide an adequate area for the construction of a missile receiving storage buildup and issuing facility proposed for fiscal year 1975 funding.

Mr. LONG. Will this take care of your F-14 Phoenix missile requirements?

General JANNELL. Yes, sir. The proposed facility will be capable of handling all missiles presently used.

Mr. LONG. Is this the only method of providing the adequate safety distances from the proposed missile facility?

General JANNELL. There is presently no area that will provide the adequate safety area required.

Mr. LONG. What are the functions for which this facility is required, and how are they being done at the present time?

General JANNELL. The facility proposed for construction on this parcel of land will be capable of receiving, storage, assembly, testing, and issue of air-to-air and air-to-ground missile weapons.

Mr. LONG. Can you show savings as a result of this acquisition and construction?

General JANNELL. Our analysis of this total project reflects a pay-back period of 5 years based on the most conservative figures.

#### AICUZ BRIEFING

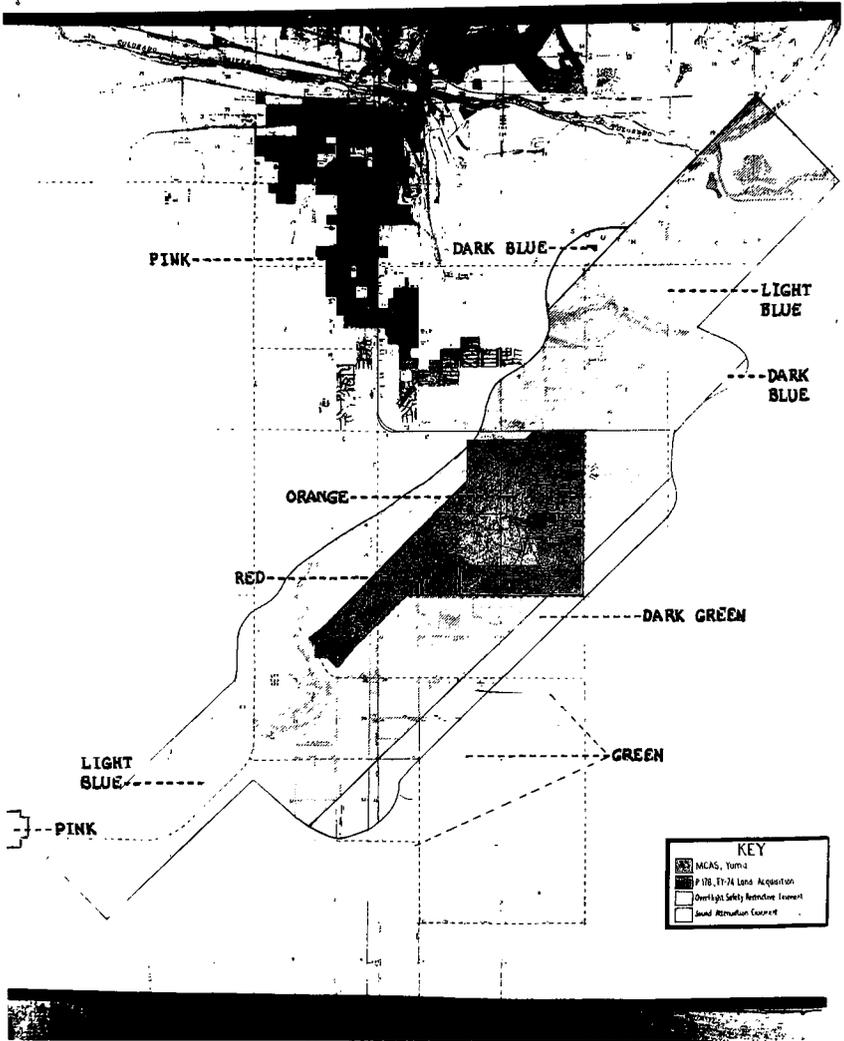
Mr. LONG. I understand you will have a briefing on the AICUZ program? Air installations compatible use zone program at Yuma?

General JANNELL. Yes, sir; I do have, sir.

Mr. LONG. Do you want to proceed on that?

General JANNELL. If I could introduce Colonel Stauch, he will present this briefing.

[The map used in the briefing follows:]



General JANNELL. That little red triangle is the proposed land we intend to purchase.

Colonel STAUCH. Mr. Chairman, this particular air station at Yuma is in the southwest corner of Arizona, approximately 25 miles north of the Mexican border, 160 miles due east of San Diego and it is where 2,336 acres of our current air station, as depicted in orange on the graph before you, exists. It is the primary facility for Navy-Marine aerial deployment for weapons training.

As the General mentioned, the 129 acre acquisition, previously mentioned, for \$635,000 of funds, would be for this particular missile training facility which would go on this property and be requested in the fiscal year 1975 program.

The city of Yuma depicted in the pink area to the north of air station has grown, over the 1960 to 1970 decade approximately 21 percent. The county of Yuma, in this area, has expanded in population about 30 percent, and the State 35 percent.

The particular population expansion in this decade has caused other construction to encroach in the area of the air station and it is our particular concern within the Marine Corps that the encroachment would cause structures to be built in areas which would be within the flight lanes and ingress and egress to the air facility would be impinged upon. The total envelope of 13,900 acres which I am outlining, in this fashion, which is depicted in this area, is the area in which we require restrictive easements of interest in the lands.

Physically the restrictive easement in this area would include building or construction of facilities which would not be compatible with the air installation utilization in this area. Mainly that a 50 to 1 glide path slope would not be precluded in this area and that such industry as agriculture and others would be compatible would be allowed to go on.

However, it would exclude construction of motels, for instance, in this particular area, or the area north here and that the buildup of large configurations of personnel or buildings would be detrimental to the utilization of flight activities in that area.

The areas marked in dark color blue and dark green represent 1,200 acres of that 13,900 acres, which would be required only for sound attenuation purposes. The type of construction that went on there would not be the problem, but anyone who would construct there would construct with sound attenuation materials which would keep the noise level about 55 decibels.

Mr. LONG. Do you say 13,000 acres?

Colonel STAUCH. That is the total within the envelope we show here.

Mr. LONG. Does the Marine Corps own all of it?

Colonel STAUCH. The Marine Corps owns only the orange area.

Mr. LONG. Are you leasing the property?

#### APPROPRIATION NOT NEEDED

Colonel STAUCH. We will do this through a land exchange authorization only. It would not be required at this time that we request appropriations, but only authorization.

Commander KIRKPATRICK. We currently have no jurisdiction over that property.

Mr. LONG. But you are preparing to buy it in the future?

Colonel STAUCH. We would like to exchange it for other Government properties, not at this time identified, but which may be identified.

Mr. LONG. Other Government properties where?

Colonel STAUCH. At locations at this time not identified, sir.

Mr. LONG. Somewhere way off the map?

Colonel STAUCH. Maybe some place in the United States not yet identified.

Mr. LONG. Why do you do it that way instead of just buying it?

Colonel STAUCH. I might defer to Mr. Markon, the real estate expert.

Mr. LONG. Is this a rather unusual way of acquiring land?

Mr. MARKON. It is not the ordinary way, Dr. Long. It is a little unusual, but when you look at the requirements and see what we are trying to accomplish here, it makes a lot of sense. This is not an immediate requirement. We have time. Yuma is in an area surrounded with a lot of land owned by the Government, managed by the Bureau of Land Management.

If there is a possibility where we can exchange other Government-owned lands for privately owned lands or restrictions in these lands we save the amount of appropriation.

Mr. LONG. We have a sort of a double coincidence of desire here, which is very hard to come by, and usually comes about only at a considerable sacrifice in price.

I am puzzled as to why you choose to go about it this way.

Mr. MARKON. The object in protecting the air station is a two-bladed sword. We protect our own operations from encroachment, but we also—

Mr. LONG. You have told us why you want to acquire this, but why do you choose to acquire it by exchange of properties somewhere else? I think you greatly narrow your market for the sale of those other properties.

Mr. MARKON. It is certainly more difficult.

Mr. LONG. You are going to have to tell these people, "Well, look, we are going to pay you not in dollars, but in some piece of land in some State, maybe Maryland, maybe New York," and he says, "Well, where is that?" And you tell him where it is and he goes and takes a look at it and says, "All right, I will take it." But he says to himself, "Only at a very considerable discount, because I have no particular plans in that area."

Mr. MARKON. We couldn't interest anybody who is running a farm, a citrus operation in this area in buying land in New York or Maryland unless there is a particular desire for relocation. There are other areas in this part of the country. There are public-owned lands and we may interest the landowners in extending their operations.

Mr. LONG. Why not go out and sell those on the open market and use the money to pay for this land?

Mr. MARKON. In the sale of the Government-owned lands, the money goes into the treasury and we must have another appropriation.

Mr. LONG. So, basically, you are trying to bypass the Treasury. This is a kind of backdoor spending, is that it?

Mr. MARKON. Not really. We are just realining our assets. We are taking other Federal assets located in a place that doesn't do us much good.

Mr. LONG. You are really keeping your defense appropriation down.  
Mr. MARKON. Yes, sir; that is one of the objectives.

LAND IDENTIFIED

Mr. McEWEN. Just to better identify this, Colonel, the area in the pink is the community of Yuma and there is another small community down at the lefthand corner that is also pink. What is the green?

Colonel STAUCH. The pink represents the town of Somerton. The green represents an agricultural area, mostly citrus and some alfalfa.

Our concern is that the eventual location of, for instance, the highway that goes through this area depicted in red, and the north-south route, there is not much traffic there but an interstate is going through here and there is a possibility of connecting roads causing cloverleaves which could cause the development of hotels, and so forth. These facilities, if they are built, will endanger the individual occupants and it would not be to their benefit to be there.

Second, it impinges on our operational capability, and longevity of the base.

I might say there is an international airport that is there as well, so this plan might well be compatible with the civilian populace.

It is located right here and there is a patent that exists that allows the military and commercial traffic to coexist.

Mr. McEWEN. What is the dark green?

Colonel STAUCH. The dark green represents the specific acreage, as well as the two blue dark areas, which are encompassed by a composite noise rating of three which is a level of not only noise but other things considered, which is supposedly a point where you will get irritation and complaints from people to a high degree, if people live there. The purpose would be to get an interest in this area concerning sound attenuation devices. It is not a safety hazard as it is in this area.

Mr. McEWEN. Is that dark green now agricultural area?

Colonel STAUCH. Yes; for the most part.

Mr. McEWEN. As well as within the sound area?

Colonel STAUCH. Yes, sir.

Mr. McEWEN. The blue is what?

Colonel STAUCH. The light blue would be restrictive easements for safety purposes and where a flight angle path of 50 to 1 should be maintained.

Mr. McEWEN. You haven't that easement at this time?

Colonel STAUCH. That is right. We have no easement outside of the orange portion.

Mr. McEWEN. The red triangular piece that you are requesting funds to acquire, what is the nature of that land and what is it used for now?

Colonel STAUCH. Right now it is about 60 percent agricultural development and 40 percent no development at all.

Mr. McEWEN. What sort of agricultural use? Is it planted in citrus?

Colonel STAUCH. There is citrus there. There are four owners, plus the State of Arizona which owns one of five parcels in that area.

## LAND COST

Mr. McEWEN. How much is your price per acre on this tract?

Mr. MARKON. For the 129 acres, \$600,000.

Mr. LONG. Roughly \$4,000 an acre.

I notice that you are paying \$635,000 for this 129 acres, or that is your proposal anyway. I notice also that you own 2,237 acres, which is almost 20 times that much, and that the land cost for the 2,237 acres is \$970,000, which isn't considerably greater than what you are proposing to pay for this 129 acres. Can you explain that?

Mr. MARKON. Yes, sir, those are historical costs, buying desert land when it was very cheap. It is not the present-day resale value, but the original investment.

Colonel STAUCH. As to the value of this particular orange parcel at this time, our investment is something over \$107 million.

Mr. LONG. I am talking about the cost at which you acquired the land. I understand land is up in value, but this is around 15 times as much per acre you would be proposing to pay for this.

Mr. McEWEN. Are there any improvements on this triangular area? Are there wells drilled for irrigation purposes?

Mr. MARKON. There is an irrigation canal, as the Colonel indicated, that is used for agricultural purposes and most of the agricultural portion is irrigated.

Mr. McEWEN. Are you saying to us that the U.S. Government owns a lot of similar land in this Yuma area that is being unused?

Mr. MARKON. It is not irrigated land. It is desert land with the potential of being irrigated.

Mr. McEWEN. It would then be worth \$4,000 an acre?

Mr. MARKON. It would be worth considerably more if it had irrigation on it, as it would as desert land.

Mr. LONG. Could you put the names of the owners of this land in the record?

Commander KIRKPATRICK. Yes, sir.

Mr. LONG. Also, it would be important to know the names of the owners of some of this other land, to whom you propose to give land in other sections in exchange for their land. I can't help wondering a little bit about this double coincidence of desire.

[The information follows:]

## LAND OWNERS

The owners of the land parcels comprising the 129 acres of the land acquisition project are as follows:

<i>Name and address of owner</i>	<i>Approximate acreage</i>
Fred W. and Vera A. Kamrath, 1330 South 10th Avenue, Yuma, Ariz.....	41.1
Leo F. and Lucille Y. Corbet, 2835 8th Street, Yuma, Ariz.....	2.4
The State of Arizona.....	8.3
Gilbert K. Ranney (trustee), 12550 Brookhurst Street, Garden Grove, Calif .....	37.6
Edward P. and Anna R. Roy, P.O. Drawer 1671, Yuma, Ariz.....	40.1
Total acreage.....	129.5

There are approximately 750 owners involved which would constitute about 2,000 parcels. Approximately 60 percent of the ownerships vary in size from 10 to 80 acres; about 30 ownerships would exceed 320 acres and up. Some of the larger land owners are Gila Investment Co., DVR Corp., and Taranton Properties,

Inc. Preliminary title data also discloses that the State of Arizona owns about 400 acres and the Federal Government (BLM) holds about 550 acres. Easements will not be acquired in the BML land.

Mr. LONG. Have these people been talked to? Has anyone said, "How would you like this little piece of real estate over there in exchange for what you have?"

Mr. MARKON. Nothing except some preliminary conversations about what we are doing in the area.

Mr. LONG. They don't know at all that you are going to ask them to exchange this land for land elsewhere instead of paying for it in cash?

Mr. MARKON. I don't think that any of them know of our plans at the moment.

Mr. LONG. You don't know for sure. Have they requested this?

Mr. MARKON. No, sir.

#### EQUIVALENT VALUE IN EXCHANGE

Mr. LONG. It is possible you can get an awful sleeper in here. Somebody comes along and he sees something somewhere and he gets it at a fraction of its value on this exchange basis.

Mr. MARKON. All of these exchanges will be on an equivalent value basis.

Mr. LONG. But who decides the value?

Mr. MARKON. It can be determined by competent contract appraisers.

Mr. LONG. Well, that sounds good.

Mr. MARKON. Yuma is not a case by itself. This is an air installation—

Mr. LONG. If somebody came along to you and said, "I like your property, and I am going to take it. We are going to have some honest, capable, competent appraiser come in and tell us how much it is worth and then we are going to take it from you."

You would have some real reservations, wouldn't you?

Mr. MARKON. That is basically the way it is done today.

Mr. LONG. I wouldn't sell any land to anybody on that basis, that they were going to come in with an appraiser to tell me how much it is worth and then take it away from me.

There is nothing like a sale which is consummated through arm's-length bargaining on both sides. I distrust anything else.

Mr. MARKON. That kind of transaction, an arm's-length sale is the determining factor in the appraisal process. You take comparable sales and you arrive at a value of similar land.

Mr. LONG. Somebody says it is comparable, but how do we know sitting a couple of thousand miles away that it is comparable? How does even the Secretary of Defense know?

Mr. MARKON. These appraisals are contracted for by land people—

Mr. LONG. There is always a difference between land, you know. I own a farm and if something was sold on the next farm, I wouldn't know if the relevance of the value of my farm would apply. There is an awful lot of difference if you just move a couple of thousand feet.

Mr. MARKON. There are professional techniques where appraisers take all these details into consideration to arrive at an assessment.

Mr. LONG. You are really proposing that to me in a serious, responsible way?

Mr. MARKON. Yes, sir. We have a hundred years of court cases where appraisers testified. It is accepted in the judicial process and it is accepted in the administrative process. On the basis of our appraisal, in another project where we have the option of condemning or buying in a voluntary sale, our percentage of acquisition, in fact the total Government percentage of acquisition under this process is very high. A project may go as high as 90 percent.

Mr. LONG. Ninety percent what?

Mr. MARKON. People voluntarily convey their lands to the Government at the appraised value.

Mr. LONG. I know, but that other 10 percent represents some very intriguing cases.

Mr. MARKON. It sure does. They have their constitutional rights guaranteed and they can have their values determined by the court.

Mr. LONG. This is my concern. Here are some people who own this land. They make a deal through appraisers—there are all kinds of things—we are all realistic people—and figure out some other slice of land they want and your nice, quick swap takes place and it looks great from here, but maybe it is and maybe it isn't.

Mr. MARKON. In our process we review these appraisals with our own staff people—

Mr. LONG. You are asking us to take your word for it?

#### STRUCTURES IN AREA

Mr. McEWEN. Colonel, what are the black lines? Do they indicate buildings within the orange area?

Colonel STAUCH. It is just a general schematic of some developments in here. In other words, this is not just an open area in here.

Mr. McEWEN. Is that military housing in there?

Colonel STAUCH. Housing actually is located over in this area here. The ordnance storage would be in this area.

Mr. McEWEN. In other words, Marine Corps personnel and dependents are living within this area of the sound that you are speaking of?

Colonel STAUCH. Yes, sir, they are living in this area on this base.

Mr. McEWEN. That leads me to another question, Colonel. You have talked about this noise factor and protecting people from it and yet Marine Corps personnel and dependents are living in this area. If they can live there, why not a motel up north of the field there where you say the highway is going?

General JANNELL. I think perhaps being an aviator I could explain this just a little bit better, sir.

We have airplanes that will be coming in, high performance jets—

Mr. McEWEN. They are in the glide path?

General JANNELL. Either taking off or landing in either direction. One thing we are concerned about is safety.

First of all, any ordnance that might fall off an aircraft, or an aircraft for some reason has a malfunction and could crash in here.

This is our big training range out here, stretching all the way to Tucson. These aircraft take off and we are concerned about safety of the people in this area.

As Yuma expands, and they are building around the corner now. Perhaps a housing development, motels could be built right off the end of the runway. This is what we are concerned about and we don't want them to build there.

In the area of sound attenuation, in our family housing we can control that by putting in sound attenuation materials. What we want to do is to be sure any building out here does have sound attenuation materials.

We have no control over what somebody in the local populace would build and this is all we are asking for. We are not asking for the land. All we are asking for is for easement above the surface of the ground, not to purchase the land itself or trade for the land, but to control what will be built in this particular area.

#### EASEMENTS SOUGHT

Mr. McEWEN. How, General, do you propose to get that control? Through local zoning, through purchase of easements?

General JANNELL. Yes, sir; that is correct, and I think Mr. Markon covered that. Through this proposed land swap. We are not ready to put up hard dollars at this time, but perhaps we might be able to swap for some government lands somewhere that these people might accept for these easements. Then through that control, through zoning—

Mr. McEWEN. Give them additional land in return for the easement. Not for the taking of the land, but payment in land for an easement. Is that what you are saying?

General JANNELL. That is right, sir.

Mr. LONG. Well then, how do you value the easement—in other words, the inconvenience or whatever of this noise? How do you value that? Who puts a value on that?

Mr. MARKON. The land has a present value now based on its highest and best use. In this particular case, if this use is for the production of citrus crops and this is projected to continue, then the imposition of an easement on that type property would have a very low value. Maybe in the neighborhood of 10 percent on the actual fee value. But if it has a high potential for motel construction and this potential is evidenced by sales along this strip—

Mr. LONG. How can we be sure we are not giving a lot of good land away in exchange for an easement which really offers no substantial diminution in the value of the land?

Mr. MARKON. All of these cases are processed through our organization, the Naval Facilities Engineering Command. There is a requirement in the law, title 10, section 2662, which requires us to report to the Armed Service Committee of the House and Senate all of these acquisitions. So our whole process will be monitored by the House and Senate Armed Services Committees.

Mr. LONG. If they want to do all the work that is required, but it does seem to me it takes a great deal of staff work for them to go down there. Isn't there anyone else who can do this?

Mr. MARKON. It is not necessarily a matter of going down and looking at it. It is a matter of proving the values. When we have approved appraisals to work from, we can produce that proof.

#### COMMISSARY SURCHARGE

Mr. LONG. The General Counsel of the Department of Defense has interpreted the language such as section 714, Public Law 92-570—the language in the DOD Appropriations Act—as forbidding the establishment of a commissary surcharge rate, “for the purpose of generating funds for construction purposes.”

This interpretation holds that “It is only the unavoidable excess collections that are considered to be nonappropriated funds and as such available for construction.”

Now, I would like to know what that means. “Unavoidable excess.”

Define for us what that means and include it in the record. What you mean by an “unavoidable excess.” Commissaries make a profit—they do everything they can to avoid making profit, but still make them? Is that what is meant?

[The information follows:]

#### UNAVOIDABLE EXCESS DEFINED

The legal interpretation by Department of Defense General Counsel is that the commissary store surcharge rate (gross profit) may be established only for the purpose of reimbursing appropriated funds for the mandatory operating expense costs, enumerated in the Department of Defense Appropriation Act. The surcharge rate established by a service may not be increased specifically for the purpose of construction. However, unavoidable excess surcharge funds (profits) remaining after paying mandatory expense costs may be used for construction, as these profits are then considered to be nonappropriated funds.

Mr. LONG. Second, would the Navy and Marine Corps be in favor of language in the Appropriations Act which made it permissible to raise the surcharge rate for the express purpose of constructing new commissaries that may be needed?

Colonel STAUCH. We would have to provide that for the record.

Mr. LONG. Please provide that information for the record. It does seem to me you are going to have a hard time on commissaries, I think. I really do. You have so many other things that are needed.

[The information follows:]

#### SURCHARGE INCREASE REVIEWED

The matter of increasing the surcharge rate to provide construction funds for commissaries is currently under discussion within the Department of Defense. Information upon which to evaluate this matter was requested from the services on July 19 for submission to the Deputy Assistant Secretary of Defense for Manpower and Reserve Affairs on August 17. Upon review of this information, it is expected that a Department of Defense position will be developed.

Mr. LONG. I think there is general skepticism about commissaries, and it may be that this is the way you can handle it: raise your rates for the purpose of raising enough money to build the commissaries.

Colonel STAUCH. We will do our level best to get you an answer on that.

Mr. LONG. It might make your life easier for you in the future.

That is all the questions I have on that.  
We will adjourn until 2 o'clock.

AFTERNOON SESSION

Mr. PATTEN. The committee will be in order.

MARINE CORPS SUPPLY CENTER, BARSTOW, CALIF.

Mr. PATTEN. We will insert page II-58 in the record.  
[The page follows:]

1. DATE 19 FEB 1973		2. DEPARTMENT NAVY		3. INSTALLATION MARINE CORPS SUPPLY CENTER											
4. COMMAND OR MANAGEMENT BUREAU MARINE CORPS			5. INSTALLATION CONTROL NUMBER 8373-200		6. STATE/COUNTRY BARSTOW, CALIFORNIA										
7. STATUS ACTIVE		8. YEAR OF INITIAL OCCUPANCY 1943		9. COUNTY (U.S.) SAN BERNARDINO		10. NEAREST CITY 6 MILES EAST TO BARSTOW									
11. MISSION OR MAJOR FUNCTIONS Receive, store, overhaul/repair and ship distribution system stock as directed by inventory control point.  Major Functions Operation of central repair shop for overhaul and repair of Marine Corps operational and combat equipment Marine Corps West Coast Supply Center  Major Activities Supported:  All Marine Corps West Coast and WESTPAC Activities and other units as assigned				12. PERSONNEL STRENGTH			PERMANENT		STUDENTS		SUPPORTED		TOTAL		
				OFFICER (1)	ENLISTED (2)	CIVILIAN (3)	OFFICER (4)	ENLISTED (5)	OFFICER (6)	ENLISTED (7)	CIVILIAN (8)			(9)	
				* AS OF 31 DEC 1972	85	825	2,159	0	0	0	0	0			3,069
				* PLANNED (End FY 1975)	93	812	2,480	0	0	4	18	0			3,407
				13. INVENTORY											
LAND		ACRES (1)		LAND COST (\$000) (2)		IMPROVEMENT (\$000) (3)		TOTAL (\$000) (4)							
* OWNED		6,281		42		45,050		45,092							
* LEASES AND EASEMENTS		1* - 0#		0		76* - 0#		76							
c. INVENTORY TOTAL (Except land rent) AS OF 30 JUNE 19 <u>72</u>										45,168					
d. AUTHORIZATION NOT YET IN INVENTORY										4,532					
e. AUTHORIZATION REQUESTED IN THIS PROGRAM										3,802					
f. ESTIMATED AUTHORIZATION - NEXT 4 YEARS										5,168					
g. GRAND TOTAL (c + d + e + f)										58,670					
14. SUMMARY OF INSTALLATION PROJECTS															
PROJECT DESIGNATION				TENANT COMMAND	UNIT OF MEASURE	AUTHORIZATION PROGRAM		FUNDING PROGRAM							
CATEGORY CODE NO. a	PROJECT TITLE b			c	d	SCOPE e	ESTIMATED COST (\$000) f	SCOPE g	ESTIMATED COST (\$000) h						
214.20	AUTOMOTIVE VEHICLE SHOPS			-	SF	22,820	976	22,820	976						
821.22	HEATING PLANT & DISTRIBUTION SYSTEM			-	BH	75,000	2,826	75,000	2,826						
						TOTAL	3,802	3,802							

480

**Marine Corps Supply Center, Barstow, Calif., \$3,802,000.**

This center serves as Marine Corps West Coast Supply Center for all west coast and WESTPAC activities, and operates a central repair shop for overhaul and repair of Marine Corps operational and combat equipment.

The programs for this activity consists of two projects, at a cost of \$3,802,000 for automotive vehicle shops and heating plant and distribution system.

**Status of funds:**

Cumulative appropriations through fiscal year 1973.....	\$16, 124, 000
Cumulative obligations, Dec. 31, 1972 (actual).....	15, 507, 283
Cumulative obligations, June 30, 1973 (estimated).....	15, 535, 206

**DESIGN INFORMATION**

Project	Design cost	Percent complete Apr. 1, 1973
Automotive vehicle shops.....	\$53, 153	10
Heating plant and distribution system.....	117, 824	9

**POSSIBLE SUPPLY ACTIVITY CONSOLIDATIONS**

Mr. PATTEN. Is there a possibility of consolidating the functions at Barstow with the other DOD supply centers on the west coast?

General JANNELL. As I mentioned previously this morning, Mr. Patten, during our discussion on Albany, Ga., we believe we have achieved the maximum degree of consolidation with external agencies.

**AUTOMOTIVE VEHICLE SHOPS**

Mr. PATTEN. What types of automotive vehicles will the project you are requesting support?

General JANNELL. This facility supports both automotive vehicles and material handling equipment.

The 310 automotive vehicles include sedans, station wagons, pickups, vans, buses, stake trucks, tractor-trailers, firetrucks, tankers, and so forth.

The 454 pieces of material handling equipment included forklifts, pallet jacks, warehouse tractors, and so forth.

Mr. PATTEN. Can you show savings from this project?

General JANNELL. Sir, in discussion with shop foremen and mechanics who work in several of the 18-odd shops spread in the areas of the supply center, it was apparent to me that a consolidation of these antiquated wood frame buildings with the fire and safety hazards they contain is certainly called for. We have performed an economic analysis on this project which quantifies both tangible and intangible benefits. Although savings are identified with a payback period of over 12 years to amortize the required investment it is a project which provides a modern venting of exhaust fumes and installs a fire prevention and working safety standard which we cannot afford to relax at any cost.

**HEATING PLANT**

Mr. PATTEN. What type of fuel is to be used in the heating plant?

General JANNELL. This project reflects a dual-fuel capability, both interruptible natural gas and No. 2 fuel oil will be used as the fuels

for the heating plants. It is planned and anticipated that there will be a sufficient supply of these required fuels.

Mr. PATTEN. Are there any questions?

Mr. DAVIS. No questions, Mr. Chairman.

MARINE CORPS BASE, CAMP PENDLETON, CALIF.

Mr. PATTEN. We will insert page 61 in the record.  
[The page follows:]

1. DATE 19 FEB 1973		2. DEPARTMENT NAVY		3. INSTALLATION MARINE CORPS BASE																																			
4. COMMAND OR MANAGEMENT BUREAU MARINE CORPS			5. INSTALLATION CONTROL NUMBER 8270-551		6. STATE/COUNTRY CAMP PENDLETON, CALIFORNIA																																		
7. STATUS ACTIVE		8. YEAR OF INITIAL OCCUPANCY 1942		9. COUNTY (U.S.) SAN DIEGO		10. NEAREST CITY 0.5 MILES SOUTH TO OCEANSIDE																																	
11. MISSION OR MAJOR FUNCTIONS Provide housing, training facilities, logistical support and certain administrative support for Fleet Marine Force Units and other units assigned. <u>Major Functions:</u> Conduct specialized schools and other training as directed Conduct individual combat training Conduct amphibious warfare training Organize and train replacement units for shipment overseas as directed <u>Major Activities Supported:</u> Marine Division Infantry Training Force Troops				12. PERSONNEL STRENGTH				TOTAL (9)																															
				PERMANENT				SUPPORTED																															
				OFFICER (1)		ENLISTED (2)		CIVILIAN (3)		OFFICER (4)		ENLISTED (5)		OFFICER (6)		ENLISTED (7)		CIVILIAN (8)																					
				a. AS OF 31 December 1972				274				2,792				3,068				3				1,785				21,246				0				30,505			
				b. PLANNED (END FY 1977)				296				2,537				3,102				36				7,919				1,904				24,742				0			
				INVENTORY																																			
				LAND				ACRES (1)				LAND COST (\$000) (2)				IMPROVEMENT (\$000) (3)				TOTAL (\$000) (4)																			
a. OWNED				125,410				4,241				174,248				178,489																							
b. LEASES AND EASEMENTS				112,910* - #				0				1,898* - #				1,898																							
c. INVENTORY TOTAL (Except land rent) AS OF 30 JUNE 1972																180,387																							
d. AUTHORIZATION NOT YET IN INVENTORY								(EXCLUSIVE OF FAMILY HOUSING \$13,972,000)								32,040																							
e. AUTHORIZATION REQUESTED IN THIS PROGRAM								(EXCLUSIVE OF FAMILY HOUSING \$21,600,000)								11,827																							
f. ESTIMATED AUTHORIZATION - NEXT 4 YEARS								(EXCLUSIVE OF FAMILY HOUSING \$15,125,000)								94,333																							
g. GRAND TOTAL (c + d + e + f)																318,587																							
14. SUMMARY OF INSTALLATION PROJECTS																																							
PROJECT DESIGNATION				TENANT COMMAND		UNIT OF MEASURE		AUTHORIZATION PROGRAM		FUNDING PROGRAM																													
CATEGORY CODE NO.		PROJECT TITLE						SCOPE		ESTIMATED COST (\$000)		SCOPE		ESTIMATED COST (\$000)																									
a		b		c		d		e		f		g		h																									
		<u>BASEWIDE</u>																																					
179.50		COMBAT TRAINING RANGES		-		IS		-		544		-		544																									
812.20		AREA LIGHTING SYSTEMS		-		IS		-		425		-		425																									
		<u>CHAPPO AREA</u>																																					
722.11		BACHELOR ENLISTED QUARTERS		-		SF		179,270		6,285		179,270		6,285																									
723.10		MESS HALL MODERNIZATION		-		SF		25,541		704		25,541		704																									
		<u>HORNO AREA</u>																																					
722.11		BACHELOR ENLISTED QUARTERS		-		SF		45,939		1,649		45,939		1,649																									
740.43		GYMNASIUM		-		SF		20,980		1,106		20,980		1,106																									

## MARINE CORPS BASE, CAMP PENDLETON, CALIF., \$10,920,000

This activity is the training base for a reinforced Marine division assigned to the west coast and conducts specialized schools and individual combat training.

The program for this activity includes seven projects totaling \$10,812,000. Of this amount, a total of \$9,744,000 is for bachelor enlisted quarters and personnel facilities. The remainder is for urgently required operational facilities and utilities.

## Status of funds:

Cumulative appropriations through fiscal year 1973-----	\$119,059,000
Cumulative obligations, Dec. 31, 1972 (actual)-----	99,495,527
Cumulative obligations, June 30, 1973 (estimated)-----	107,425,174

## DESIGN INFORMATION

Project	Design cost	Percent complete, Apr. 1, 1973
Combat training ranges-----		31
Area lighting systems-----	19,812	20
Bachelor enlisted quarters-----	316,848	1
Mess hall modernization-----	28,040	28
Bachelor enlisted quarters-----	77,459	10
Gymnasium-----	52,884	19
Telephone cable-----	5,600	47
Approach lighting-----	2,262	34

*Current bachelor enlisted status at MCB, Camp Pendleton, Chappo*

1. Effective BEQ requirement-----	3,727
2. Adequate assets-----	720
Installation-----	720
Community-----	0
3. Deficit-----	3,007
4. Fiscal year 1974 project-----	1,110
5. Remaining deficit after fiscal year 1974-----	1,897

*Current bachelor enlisted status at MCB, Camp Pendleton, Horno*

1. Effective BEQ requirement-----	2,881
2. Adequate assets-----	11
Installation-----	0
Community-----	11
3. Deficit-----	2,870
4. Fiscal year 1974 project-----	288
5. Remaining deficit after fiscal year 1974-----	2,582

Mr. PATTEN. What are the deficiencies in your combat training ranges, and will this project meet these deficiencies?

General JANNELL. This project meets a major portion of our combat training requirements at Camp Pendleton, to include a small arms, moving target range, a gas chamber facility, a tank obstacle course, a combat village, and a vitally needed control facility to provide communication control in our northern range. We have some other deficiencies. However, these represent our most urgent need.

Mr. PATTEN. Can you discuss the scope of and the requirement for the gymnasium project you are requesting in the amount of \$1,106,000?

General JANNELL. The current construction criteria would permit 42,000 square feet of gymnasium space. However, our request is for approximately 2,100 square feet. This camp is located within Camp Pendleton, roughly an equal distance from the northern and southern extremities of the base.

It is planned to construct this facility to serve the needs of the Camp Horno area marines and plan additional ones at other camps within Camp Pendleton. This will be the first structure designed and built as a gym at Camp Pendleton for our marines. It will allow us to provide space for spectator sports with a 1,000-spectator seating capacity.

Mr. PATTEN. Maybe I didn't hear you right, did you say this only involves 2,100 feet?

General JANNELL. I am sorry, 21,000 square feet, sir.

MARINE CORPS AIR STATION, EL TORO, CALIF.

Mr. PATTEN. Insert page II-71 in the record.  
[The page follows:]

1. DATE 19 FEB 1973		2. DEPARTMENT NAVY		3. INSTALLATION FY 1974 MILITARY CONSTRUCTION PROGRAM			4. STATE/COUNTRY MARINE CORPS AIR STATION													
4. COMMAND OR MANAGEMENT BUREAU MARINE CORPS				5. INSTALLATION CONTROL NUMBER 8139-875		6. STATE/COUNTRY EL TORO, CALIFORNIA														
7. STATUS ACTIVE			8. YEAR OF INITIAL OCCUPANCY 1943		9. COUNTY (U.S.) ORANGE		10. NEAREST CITY 8 MILES NORTHEAST TO SANTA ANA													
11. MISSION OR MAJOR FUNCTIONS Maintain and operate facilities and provide services and material to support operations of a Marine Aircraft Wing, or units thereof, and other activities and units as designated by the Commandant of the Marine Corps in coordination with the Chief of Naval Operations.  Major Units Supported: One Marine Aircraft Wing (less helicopter group) with 8 operating squadrons Four Naval Aviation Maintenance Training Detachments										12. PERSONNEL STRENGTH		PERMANENT			STUDENTS			TOTAL (9)		
										OFFICER (1)	ENLISTED (2)	CIVILIAN (3)	OFFICER (4)	ENLISTED (5)	OFFICER (6)	ENLISTED (7)	CIVILIAN (8)			
										a. AS OF 31 DEC 1972		149	1,594	1,779	75	255	822	5,528	401	10,603
										b. PLANNED (END FY 1974)		118	867	858	24	130	637	5,455	0	8,089
										13. INVENTORY										
										LAND		ACRES (1)		LAND COST (\$000) (2)		IMPROVEMENT (\$000) (3)		TOTAL (\$000) (4)		
										a. OWNED		4,225		2,242		80,863		83,105		
										b. LEASES AND EASEMENTS		867* - 18#		0 - 0#		641		641		
										c. INVENTORY TOTAL (EXCEPT LAND RENT) AS OF 30 JUNE 19 72										
										d. AUTHORIZATION NOT YET IN INVENTORY (EXCLUSIVE OF FAMILY HOUSING \$6,830,000)										
e. AUTHORIZATION REQUESTED IN THIS PROGRAM (EXCLUSIVE OF FAMILY HOUSING \$ 0)																				
f. ESTIMATED AUTHORIZATION - NEXT 4 YEARS (EXCLUSIVE OF FAMILY HOUSING \$ 0)																				
g. GRAND TOTAL (c + d + e + f)																				
14. SUMMARY OF INSTALLATION PROJECTS																				
PROJECT DESIGNATION					AUTHORIZATION PROGRAM		FUNDING PROGRAM													
CATEGORY CODE NO. a	PROJECT TITLE b				TENANT COMMAND c	UNIT OF MEASURE d	SCOPE e	ESTIMATED COST (\$000) f	SCOPE g	ESTIMATED COST (\$000) h										
431.10	COLD STORAGE AND READY ISSUE WAREHOUSE				-	SF	14,409	747	14,409	747										
1/ INCLUDES \$1,698,000 FOR POLLUTION ABATEMENT.																				

## MARINE CORPS AIR STATION, EL TORO, CALIF., \$747,000

This station maintains and operates facilities and provides services and materials to support operations of the major elements of a Marine aircraft wing.

One project totaling \$747,000 will provide this station with a cold storage and ready issue warehouse to store and refrigerate perishable items.

## Status of funds :

Cumulative appropriations through fiscal year 1973.....	\$55, 677, 000
Cumulative obligations, Dec. 31, 1972 (actual).....	54, 100, 469
Cumulative obligations, June 30, 1973 (estimated).....	54, 392, 574

## DESIGN INFORMATION

Project	Design cost	Percent complete Apr. 1, 1973
Cold storage and ready issue warehouse.....	\$35, 856	47

Mr. PATTEN. What are you currently using for cold storage here?

General JANNELL. Sir, the facility presently utilized is a temporary structure erected in 1943. This 30-year-old building has deteriorated to the point where perishable food losses are a daily reality.

MARINE CORPS BASE, TWENTYNINE PALMS, CALIF.

Mr. PATTEN. Insert page 76 in the record.

[The page follows:]

1. DATE 19 FEB 1973		2. DEPARTMENT NAVY		3. INSTALLATION FY 1974 MILITARY CONSTRUCTION PROGRAM			5. INSTALLATION MARINE CORPS BASE							
4. COMMAND OR MANAGEMENT BUREAU MARINE CORPS			6. INSTALLATION CONTROL NUMBER 8270-800			8. STATE/COUNTRY TWENTYNINE PALMS, CALIFORNIA								
7. STATUS ACTIVE			9. YEAR OF INITIAL OCCUPANCY 1952			9. COUNTY (U.S.) SAN BERNARDINO		10. NEAREST CITY 50 MILES SOUTHWEST TO PALM SPRINGS						
11. MISSION OR MAJOR FUNCTIONS Provide housing, training facilities, logistical and administrative support for Fleet Marine Force Units and other units assigned. Operate the Communication-Electronic Schools.  <b>Major Functions:</b> Provide facilities for Force Troops, FMF Pacific Train personnel in Operational Communications, communication material and electronics Conduct reserve training as directed  <b>Major Activities Supported:</b> Force Troops, Fleet Marine Force, Pacific Communication - Electronics Schools <b>14. Artillery Battalion</b>				12. PERSONNEL STRENGTH		PERMANENT		STUDENTS		SUPPORTED		TOTAL (9)		
				OFFICER (1)	ENLISTED (2)	CIVILIAN (3)	OFFICER (4)	ENLISTED (5)	OFFICER (6)	ENLISTED (7)	CIVILIAN (8)			
				A. AS OF 31 DEC 1972		155	1,065	617	16	1,028	160	2,262	0	5,303
				B. PLANNED (END FY 1975)		158	1,453	447	30	3,100	158	1,779	0	7,125
12. INVENTORY  LAND  A. OWNED B. LEASES AND EASEMENTS C. INVENTORY TOTAL (EXCEPT LAND FROM) AS OF 30 JUNE 19 72 D. AUTHORIZATION NOT YET IN INVENTORY E. AUTHORIZATION REQUESTED IN THIS PROGRAM F. ESTIMATED AUTHORIZATION - NEXT 4 YEARS G. GRAND TOTAL (C + D + E + F)				ACRES (1)		LAND COST (\$000) (2)		IMPROVEMENT (\$000) (3)		TOTAL (\$000) (4)				
				595,383		1,610		43,165		44,775				
				222* - 15#		0* - 35#		0		35				
				44,810		9,395		2,992		9,059				
				66,256		66,256		66,256		66,256				
SUMMARY OF INSTALLATION PROJECTS														
PROJECT DESIGNATION				TENANT COMMAND c	UNIT OF MEASURE d	AUTHORIZATION PROGRAM		FUNDING PROGRAM						
CATEGORY CODE NO. a	PROJECT TITLE b					SCOPE e	ESTIMATED COST (\$000) f	SCOPE g	ESTIMATED COST (\$000) h					
171.20	APPLIED INSTRUCTION BUILDINGS			-	SF	68,779	2,992	68,779	2,992					

488

## MARINE CORPS BASE, TWENTYNINE PALMS, CALIF., \$2,992,000

This base provides housing, training facilities, logistical support and certain administrative support for Fleet Marine Force units, conducts training and provides logistic support to other Marine Corps activities.

The program for this base includes one project totaling \$2,992,000 to provide urgently needed applied instruction buildings.

Status of funds:

Cumulative appropriations through fiscal year 1973.....	\$29,280,000
Cumulative obligations, Dec. 31, 1972 (actual).....	22,680,900
Cumulative obligations, June 30, 1973 (estimated).....	24,224,716

## DESIGN INFORMATION

Project	Design cost	Percent complete, Apr. 1, 1973
Applied instruction buildings.....	\$5,132	1

Mr. PATTEN. Will the project for an applied instruction building complete the facility required to move Communications Electronics school to this location?

General JANNELL. Yes, sir.

It is anticipated that the remainder of the battalion will move to Marine Corps Base Twentynine Palms upon completion of the new facility.

Mr. PATTEN. How does the Marine Corps Communications-Electronics Training given here differ from that of the other services, particularly the Navy? Is there a possibility of further consolidations with the Navy or other services in this area?

General JANNELL. Sir, the Marine Corps uses seven unique items of anti-air warfare equipment. This equipment is designed specifically for the amphibious warfare role. It is light in weight, helicopter transportable and can function in the most severe field conditions. Due to the uniqueness of this equipment, the possibility of consolidating the training with the Navy or other services is not feasible.

## MARINE CORPS AIR STATION, KANEOHE BAY, HAWAII

Mr. PATTEN. Insert page II-79 in the record.

[The page follows:]

1. DATE 19 FEB 1973		2. DEPARTMENT NAVY		3. INSTALLATION MARINE CORPS AIR STATION								
4. COMMAND OR MANAGEMENT BUREAU MARINE CORPS		5. INSTALLATION CONTROL NUMBER 8139-700		6. STATE/COUNTRY KANEOHE BAY, HAWAII								
7. STATUS ACTIVE		8. YEAR OF INITIAL OCCUPANCY 1941		9. COUNTY (U.S.) HONOLULU	10. NEAREST CITY 16 MILES SOUTH TO HONOLULU							
11. MISSION OR MAJOR FUNCTIONS To maintain and operate facilities and provide services and material to support operations of a Marine Aircraft Wing, or units thereof, and other activities and units as designated by the Commandant of the Marine Corps in coordination with the Chief of Naval Operations. Major Units Supported: 1 Marine Brigade consisting of 1 Marine Regiment 1 Marine Aircraft Group (comprised of 3 fighter-attack squadrons and 3 helicopter squadrons) Pacific Missile Range Facility 1 Radio Battalion 1 Army-Navy Gunfire Liaison Company 1 Marine Air Traffic Control Unit 1 Marine Air Control Squadron				12. PERSONNEL STRENGTH		PERMANENT		STUDENTS		SUPPORTED		TOTAL (9)
				OFFICER (1)	ENLISTED (2)	CIVILIAN (3)	OFFICER (4)	ENLISTED (5)	OFFICER (6)	ENLISTED (7)	CIVILIAN (8)	
* AS OF 31 DEC 1972				56	455	836	0	0	644	4,669	0	6,660
* PLANNED (End FY 1975)				83	869	463	6	44	533	5,755	0	7,753
13. INVENTORY												
LAND		ACRES (1)		LAND COST (\$000) (2)		IMPROVEMENT (\$000) (3)		TOTAL (\$000) (4)				
* OWNED		2,952		2,837		78,655		81,492				
* LEASE AND EASEMENTS		50,337* - 1#		(3* - 0#)		28* - 0#		28				
c. INVENTORY TOTAL (Except land rent) AS OF 30 JUNE 19 72										81,520		
d. AUTHORIZATION NOT YET IN INVENTORY										4,441		
e. AUTHORIZATION REQUESTED IN THIS PROGRAM										5,988		
f. ESTIMATED AUTHORIZATION - NEXT 4 YEARS										18,146		
g. GRAND TOTAL (c + d + e + f)										110,095		
14. SUMMARY OF INSTALLATION PROJECTS												
PROJECT DESIGNATION				TENANT COMMAND c	UNIT OF MEASURE d	AUTHORIZATION PROGRAM		FUNDING PROGRAM				
CATEGORY CODE NO. e	PROJECT TITLE b					SCOPE f	ESTIMATED COST (\$000) g	SCOPE h	ESTIMATED COST (\$000) i			
211.06	AIRCRAFT HANGAR IMPROVEMENTS			-	SF	74,880	485	74,880	485			
722.11	BACHELOR ENLISTED QUARTERS			-	SF	124,492	5,130	124,492	5,130			
851.10	CONNECTING ROAD TO INTERSTATE HIGHWAY			-	SY	17,000	373	17,000	373			
						TOTAL	5,988		5,988			

490

## MARINE CORPS AIR STATION, KANEOHE BAY, OAHU, HAWAII, \$5,988,000

This station supports the operations of the 1st Marine Brigade consisting of one Marine regiment and one Marine air group (composite).

Three projects totaling \$5,988,000 will provide this station with a bachelor enlisted quarters, aircraft hangar improvements, and connecting road to Interstate Highway H-3.

Status of funds:

Cumulative appropriations through fiscal year 1973.....	\$36,018,000
Cumulative obligations, Dec. 31, 1972 (actual).....	30,818,627
Cumulative obligations, June 30, 1973 (estimated).....	31,845,907

## DESIGN INFORMATION

Project	Design cost	Percent complete, Apr. 1, 1973
Aircraft hangar improvements.....	\$15,634	19
Bachelor enlisted quarters.....	132,000	23
Connecting road to interstate highway.....	20,000	20

*Current bachelor enlisted status at MCAS, Kaneohe Bay*

1. Effective BEQ requirement.....	6,582
2. Adequate assets.....	525
Installation.....	504
Community.....	21
3. Deficit.....	6,057
4. Fiscal year 1974 project.....	756
5. Remaining deficit after fiscal year 1974.....	5,301

Mr. PATTEN. What is the mission of this activity?

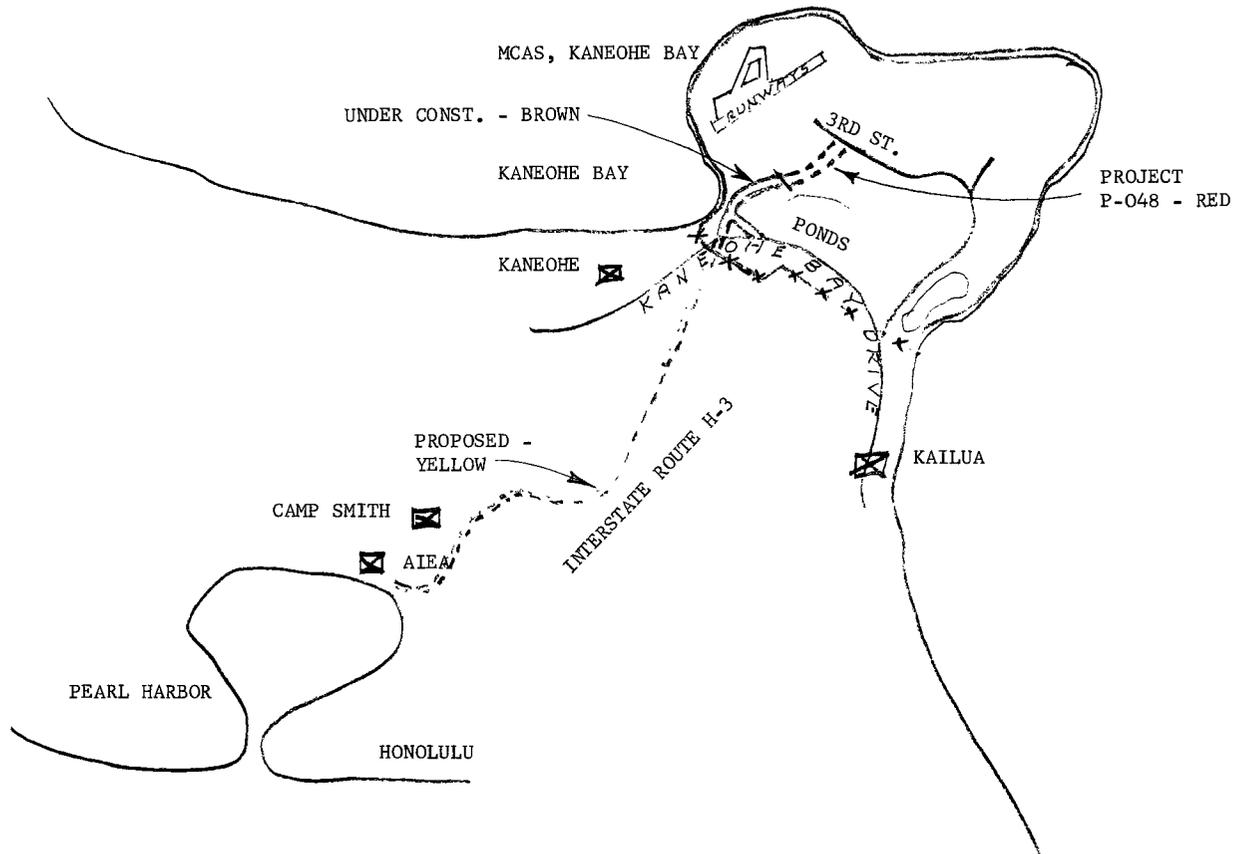
General JANNELL. Sir, the mission is to maintain and operate facilities and provide services and material to support operations of a Marine brigade or units thereof or other activities and units as designated by the Commandant of the Marine Corps. Additionally this base provides aviation support for the Headquarters, Fleet Marine Force, Pacific. Kaneohe supports helicopter and fixed wing aircraft.

Mr. PATTEN. Have you got a map showing the road?

General JANNELL. Yes, sir.

Colonel Stauch will explain the map we have showing this new road we have requested.

[The map used for explaining the road system follows:]



Colonel STAUCH. This is where the Brigade is located within the Marine Corps Station, Kaneohe Bay. The red area indicates the project as requested for \$373,000, which is the surfacing of a four-lane road which would provide a new access route to the H-3, which is the interstate, which runs across the island.

The intersection and interchange is to be completed here by the State and Federal linkup with Kaneohe Drive and is scheduled about November 1973, from the information we have from the Federal highways.

This is the runway and taxiway system. Currently we come in through the main gate and up to this point and through the family housing area into the operational area of the base. This area here has a combat firing range and so on. Here you see the interchange as the key point for November 1973, when this interchange is scheduled, roughly, for opening. This will give a new gate approach into the base more consistent with the internal roads and the highway system which is proposed to go to the other side of the island.

There is about a 4 mile portion of interstate completed in this program and the interchange is due to be completed in November 1973.

This particular project which we are requesting is 1,670 feet long, covering 17,000 square yards of pavement.

Mr. PATTEN. Are there any questions?

Mr. DAVIS. Is the air-conditioning for the personnel or does it have something to do with the other facilities?

General JANNELL. It is in the shop space within the hangars where they are working on the various equipments. The sound attenuation and air-conditioning is in the shop space only.

Admiral MARSCHALL. In answer to your broader question, however, Mr. Davis, Hawaii does meet the criteria for comfort air-conditioning, and practically all the hotels and apartments are air-conditioned, and many of the homes. Not in every place you are in on the island will you have the breezes that are so prevalent along the beaches. This is environmental as opposed to comfort air-conditioning for this project.

Mr. PATTEN. In fact, Hawaii is farther south than any part of the United States.

Admiral MARSCHALL. The climate is much more equable because of the trade winds.

#### GENERAL JANNELL COMMENDED

Mr. PATTEN. General, I don't know if there is going to be any more testimony from you, but I want you to know you have been a good witness and I want to congratulate you. I hope you enjoy your stay in Japan and we look forward to your coming back and being with us.

General JANNELL. Mr. Patten, I would like to express my appreciation for the opportunity to present the Marine Corps military construction program before this committee. The projects which comprise this program have been scrutinized and in our judgment represent valid sorely needed requirements. As you state, this is my last scheduled appearance before this committee prior to transfer, and I wish to thank you and the committee for your concern and continued interest in Marine Corps facilities.

Mr. PATTEN. I always tell people this is the most humanitarian committee in the House. We deal with people and their needs. I say that because some of our friends have the reaction that we are dealing with bombs and flame throwers. I only wish the men in the field would know how military leaders are here literally begging and exhorting the Congress to provide them with the things you know are needed and which the men feel they should have.

You have been a good witness and I hope you enjoy your stay in Japan and come back with us before too long.

General JANNELL. Thank you.

Mr. DAVIS. Good luck to you, General Jannell.

General JANNELL. Thank you.

## NAVY PROJECTS

### FIFTH DISTRICT

#### NAVAL STATION, NORFOLK, VA.

#### BRIEFING ON SEWELL POINT COMPLEX

Mr. MURPHY. Sir, this chart shows the Sewell's Point area of Norfolk, Va. The area in brown is the Navy's base at that location. The brown area comprises some 4,200 acres. That acreage has been acquired over the years commencing back with the Jamestown Exposition in the early part of the century. Within the brown area the Navy has concentrated several of the key commands of the Atlantic Fleet. Indeed, this base is the principal and most vital base supporting the Atlantic Fleet operations.

We have the naval station, with deep water piers, deep water access. We have the largest Naval Supply Center in the Navy at this location. At the Naval Air Station, Norfolk, we conduct flight operations and the Naval Rework Facility is located there. Swinging to the south we have the headquarters command of the Atlantic Fleet and the Armed Forces Staff College, and then up to the destroyer-submarine pier area here. The 4,200 acres represents acquisitions through WW II. Our master planning studies conducted after WW II and in the early 1960's showed that in order to protect this vital resource, this vital base, it was necessary for the Navy to acquire the area shown in green. This was the 509.5 acres, owned by the Norfolk & Western Rail Co. and used for railcar holding yards. The former operation on the waterfront by the coal company had terminated. Essentially it was used for storage of coal cars prior to shipment overseas from another location in Norfolk. The primary reasons for needing this land resulted from several pressing operational situations. Fleet berthing needs for the larger ships, principally oilers, prompted the need for additional waterfront berthing capability.

Operations on the Naval Air Station runway with high performance aircraft were becoming hazardous and a need to expand the runway to a full 8,000 feet was another requirement for land. Hence an expansion this way into the area I am speaking of was indicated. The Hampton Roads Army Terminal was closed out in the mid-1960's and our supply center absorbed many of their functions. So there was a need for that supply center to expand to improve its packing (container stuffing) and storage areas. So in the fiscal 1970 and 1972 MILCON programs, the Navy proceeded with a request for MILCON authorization

and funding to buy this 509.5 acres. That project was approved in fiscal 1972, and we have proceeded with the acquisition. I would like to show you by transferring to a larger chart how the Navy is proposing to utilize that land. Essentially the linen colored area is the original Navy property and part of our original acreage. The white is non-Navy property. The colored area is the development plan for the 509.5 acres. It provides for the construction of two piers on the waterfront eventually.

#### DEVELOPMENT PLAN

The first of these piers—Pier 1—is proposed in the 1974 MILCON program before you now. The storage warehouse for cold storage was approved last year and construction is about to start on this facility.

In 1975 we are presently proposing a medical facility, dispensary and dental clinic at the corner here at an optimum location. In out years beyond the immediate 1975 program we have projects to extend the runway, as you see here, construct an apron and additional passenger and air cargo facilities here, and open storage sites which are compatible with this runway use here for the supply center, with a convenient expansion this way.

Mr. McKAY. Let me interrupt here. Is that cold storage?

Mr. MURPHY. Yes, frozen storage.

So the complete and ultimate development as you see in this architectural rendering will take place over several program years.

Essentially that is what I had proposed to tell you about it.

Mr. McEWEN. Is there no taxi strip from the new terminal to the field? They use the runway?

Mr. MURPHY. That is the plan. The runway will project across a tunnel. This is an interstate highway that is yet to be constructed. However, the Virginia Department of Highways is preparing to construct this now. That project includes a depressed section over which the runway will project. We propose to live with that as an access to this side in view of the difficulties of a much longer tunnel and the cost.

Mr. PATTEN. You got the best of it there.

Mr. MURPHY. Yes, sir.

Mr. McKAY. How many acres do you have on the whole base?

Mr. MURPHY. 4,200 acres is the original area. The new acquisition adds 510 acres.

Mr. NICHOLAS. May I ask a question on the runway? You say it is not programmed in the out years.

Mr. MURPHY. We estimate fiscal 1976 which would be compatible with the Virginia Department of Highways schedule.

Mr. NICHOLAS. But it is still a live project. This was one of the major reasons for the land acquisition.

Mr. MURPHY. Yes.

Our only hesitation relates to the highway program. They are having their problems.

Mr. PATTEN. Are you entitled to sell all the old railroad tracks?

Mr. MURPHY. For the answer to that, I would ask Mr. Markon to comment.

Mr. MARKON. There is quite a bit of salvage value.

Our agreement with the railroad is that they will reserve the title to the ties and tracks and they will remove them and leave us with a clear piece of property.

Mr. PATTEN. So you know what it is worth ?

Mr. MARKON. It is worth quite a bit to have them removed.

Mr. PATTEN. Is there anything new or different about your piers that you contemplate ?

Mr. MURPHY. These are typical fleet berthing piers, 1,400 feet long. It is proposed to use the foundations of the old coal pier operation and hopefully retain some of the substructures and incorporate them in our piers. This is the one in 1974 and this one in 1975.

Mr. PATTEN. They do not go out to deep water, do they ?

Mr. MURPHY. They are 1,400 feet long.

Mr. PATTEN. I mean the old coal docks.

Mr. MURPHY. No, sir, the coal pier was roughly 1,050 feet long.

Mr. PATTEN. How deep is it there ?

Mr. MURPHY. The channel is 45 feet and we will provide a dredged access of 45 feet. The land acquisition has the other advantage of closing the gap between the supply center area and the destroyer submarine piers so that we get a more efficient continuous flow across our waterfront.

The cold storage project is a replacement for a cold storage facility on the base now which is a 1916 vintage building that is in a state of almost collapse. It was an urgently needed project when it was approved last year.

Mr. PATTEN. You are too young to remember we used ice cakes for cold storage.

Mr. MURPHY. This old one uses a straight ammonia system through the pipes.

Mr. PATTEN. Are there further questions ?

#### TENANT LEASEHOLDS

What is the Navy's outstanding liability for the purchase of tenant leasehold interests ?

Mr. MARKON. On this piece of property we acquired from the Norfolk & Western there are approximately 50 tenants. Under a law passed by Congress in 1971, called the Uniform Acquisition and Relocation Act, these people are entitled to relocation expenses and loss of business expenses at a minimum of \$2,500 but not to exceed \$10,500. The value of their interest in the real property has been measured by appraisals and it is approximately \$1.5 million. We do not have a good estimate on the exact relocation cost for entitlement depends on whether or not the tenants actually relocate to another area and the loss of business as a result of the relocation. This will have to be determined.

Mr. PATTEN. You amaze me with the number of leaseholds. I am surprised there are that many.

Admiral MARSHALL. Sir, that is a big piece of property.

Mr. PATTEN. I know it is.

#### BERTHING PIER REQUESTED

Mr. PATTEN. You are requesting a berthing pier in the amount of \$9,624,000. Where will this be built, and what is the basis for your estimate of the condition of the existing pier facilities and the amount of additional work which is required ?

Captain WATSON. The pier will be on the newly acquired land on top of the old Norfolk & Western pier 1. There are presently pilings from the old pier in place. This is a photograph of the actual conditions now, showing the deck of the pier removed. The Navy will propose to construct a standard type pier with a reinforced concrete deck on top of the present piling.

Mr. MCKAY. You won't need to replace those pilings?

Captain WATSON. No, sir.

Mr. PATTEN. They look like concrete. That will be some pier—1,400 feet.

Captain WATSON. The pier is needed for the larger type ships, the AOE's and the oilers. The AOE's are approaching the size of a carrier. This class of ship presently has to go berth at Craney Island on the other side of the harbor. It is 5 miles by boat or 26 miles by car. There are no recreation facilities, cold iron, or personnel support facilities on the island. In view of the oil storage in the vicinity there is no welding or burning work possible on the pier or on the ships. This project will permit berthing at the naval station.

Mr. PATTEN. While they will berth there, do you contemplate building storage tanks in the area?

Captain WATSON. No, sir.

Mr. PATTEN. There is no need for it?

Captain WATSON. The Navy is investigating the possibility of a fuel line to the island.

Mr. PATTEN. Why do we feel we can use the existing piers?

Commander KIRKPATRICK. They have been visually inspected by our division in Norfolk and they feel we can use them.

Mr. MCKAY. How do you know these have not corroded down under the water unless you went down there and checked them?

Mr. MURPHY. The design of the new pier provides a retaining wall around each of the piers to protect the timber. The timber underpinnings will have to be enclosed to protect them from settling.

Mr. PATTEN. How old are these supports?

Mr. MURPHY. The coal pier dates from 1908.

[Discussion off the record.]

#### SHIPS HOMEPORTED

Mr. PATTEN. We were inquiring with respect to the additional work required in the event you used the existing piers, but I think you were about to say that it would not be too great and I do not think there is any question that you will not be able to use those piers.

There were 162 ships homeported at Norfolk in 1969, including 48 combatants and 46 auxiliaries. In 1974—even after the realignment—there will be 116 ships, including 44 combatants and 23 auxiliaries. What is the need for additional pier facilities in this and future construction programs at Naval Station, Norfolk, in view of the decrease in your shipload?

Captain WATSON. The actual number of ships is going down over the years, however, the size of the ships is increasing. The fiscal 1973 total number of ships homeported is the low point with a total number of 80 ships homeported at Norfolk. The total will rise after base closure to approximately 104.

In 1968 there were 118 ships. If we put them all end to end we have a total length of 55,000 feet. In 1978, we will have only 104, but we will have 56,000 feet of shipping. So, although the number has gone down from 118 to 104, the total length of all these ships has gone up by 1,000 feet.

#### CONCENTRATION QUESTIONED

Mr. PATTEN. Can you discuss the projects to relocate the fleet landing and dredge next to pier 2?

Mr. MCKAY. If I may, first, it seems as though we are getting a tremendous concentration. The policy of the military not too many years ago was to scatter so that you were not vulnerable on any given attack to be wiped out. Do we now see that there is no danger in concentration?

Admiral MARSCHALL. There is a danger definitely whenever you concentrate any of your military forces. A great number of these forces are deployed. We must use concentration as one of the constraints in any base closure action, such as the one we recently had. But we have to balance it off against other things which are equally real.

Mr. MCKAY. Are you saying to me you are offsetting the concentration on the base by deployment of the ships themselves?

Admiral MARSCHALL. Traditionally the ships are deployed, but they may not be deployed as frequently. Suppose they all stay in—we still have considered the matter of concentration versus all the other real things that take place, such as the cost of doing business today, the scattering of the bases, and the necessity to save some money.

[Discussion off the record.]

Mr. MCKAY. How many major bases will we now have after you get through your consolidation?

Admiral MARSCHALL. On the east coast we have Norfolk, Charleston, and Mayport. New London is a submarine base. On the west coast we have San Diego, Long Beach, which is a shipyard and alternate port if necessary, San Francisco Bay area, where we have the air station at Alameda and carrier berthing, and the Bremerton shipyard complex.

Mr. MCKAY. You have four or five major bases on each coast.

Admiral MARSCHALL. Yes. At Pearl Harbor we have the 3rd Fleet. So we are not really all concentrated. But again it is a consideration that was looked at very carefully in this base closure exercise.

Captain WATSON. Of 104 ships home ported in 1978, using the planning factor for ships deployed and ships in shipyards, the maximum ships in home port at one time will be 64.

Mr. MCKAY. Out of how many?

Captain WATSON. Out of 104, 64 will be in port. This is an average.

Mr. MCKAY. That is about two-thirds in port.

Captain WATSON. That would be the maximum number, for example, on a weekend.

#### BERTHING NEEDS

Mr. PATTEN. What ships would be berthed at this pier you plan to build?

Captain WATSON. Mr. Chairman, we would berth the oilers, AOE's, AOR's, and ultimately one of the submarine tenders.

Mr. PATTEN. Can you discuss the projects to relocate the fleet landing and dredge next to pier 2?

Captain WATSON. The present fleet landing is located adjacent to pier 2. Pier 2 is primarily a supply pier. By removing the breakwater and relocating the fleet landing to this area on the new land [pointing] and dredging we have berthing for one or two more large ships at pier 2. So for a minimum cost we get another 400 feet of pier berthing.

Mr. PATTEN. Then your new land acquisition makes this possible.

Captain WATSON. Yes, sir.

This is a photograph showing the type of ships that we will be berthing there. Nesting them as shown is a hazard to the ships and by having additional berthing they can be separated.

Mr. PATTEN. Is this the most economical method of providing the additional berthing?

Captain WATSON. Yes, sir. By simply relocating the fleet landing you get the equivalent of one berth, at least, and in an emergency tie up two ships together.

Mr. PATTEN. What is the requirement for the additional berthing?

Captain WATSON. This additional berthing is being driven by the ships relocating from Newport.

Mr. PATTEN. What water depth do you have there? Do you get 45 feet?

Captain WATSON. No, sir. We will be dredging Pier Z to 35 feet. Thirty-five plus two, or 37 feet, primarily for the supply ships and the amphibious ships.

Mr. PATTEN. I don't think you have the problem of maintaining your depth that we do on rivers.

Captain WATSON. No, sir.

Admiral MARSCHALL. It is a pretty good location as far as dredging problems.

## PROJECTS REQUESTED AT NAVAL STATION, NORFOLK, VA.

### ENLISTED DINING FACILITY MODERNIZATION

Mr. PATTEN. You are requesting \$1,425,000 to modernize the enlisted men's dining facility. Why will this cost \$42.98 cents a square foot?

Commander KIRKPATRICK. We have an existing large brick facility which requires a lot of interior work, air-conditioning, replacement of utilities, windows, food preparation equipment, and so on, which is all included in that, sir.

Mr. PATTEN. Can you provide some further details for the record? [The information follows:]

### MODERNIZATION DETAILS

The original feeding capacity in this building was 10,000 men, with two similar serving and eating areas arranged about the centerline of the building. Present needs are for a 2,000 man feeding capacity. The modernized plan will use only a segment of the original building for messing functions, and the balance will revert to other use. In rearranging to suit modern food preparation, serving, and dining practices, little opportunity is afforded for reuse of underfloor piping and drain-lines, the old installation being just too spread-out. New service lines must be run to the modern equipment. Back-up spaces such as a bakery and frozen and chilled storage must be completely rebuilt.

All existing food preparation, serving, and dining equipment is obsolete and must be replaced. Modern lighting, electrical power, and air-conditioning must be provided. The austere interior wall and floor finishes must be improved to modern sanitary standards.

In view of the good condition of the basic structure, its foundation and its exterior condition, and considering its ideal location in the quarters area, the modernizations approach is considered sound and economical.

#### COLD IRON

Mr. PATTEN. Is the pier utilities project a part of the Navy's cold iron facilities program?

Admiral MARSCHALL. Yes, sir.

Mr. PATTEN. What ships will this support, and what are the deficiencies in the current support facilities?

Captain WATSON. This pier is primarily for the 688 class submarine. The main part of the project increases the electrical capabilities of pier 22. There are some electrical modifications to piers 12, 22, and 20, but, as I say, the primary purpose of the project is to provide additional power on pier 22, which will support the 688 class submarine. On piers 12, 22, and 20, we are changing the electrical shore power cable connections. The present ones are obsolete and a safety hazard. We are afraid somebody might get electrocuted because of their condition.

On pier 23 and pier 22 the project will increase the number of steam and water outlets.

#### SURVEYS AND INVESTIGATIONS STAFF REPORT ON THE COLD IRON PROGRAM

Mr. PATTEN. The surveys and investigations staff of the committee has completed a report on the Navy's cold iron facilities program. Unless there is objection, we will insert it in the record at this point. [The report follows:]

MAY 10, 1973.

Re Military construction program for fiscal year 1974.

#### PROJECTS RELATED TO THE COLD IRON PROGRAM OF THE NAVY

By directive dated February 22, 1973, the committee requested that an inquiry be made into projects relating to the cold iron program of the Navy which are requested in the Navy military construction program for fiscal year 1974.

The inquiry has been completed and the results incorporated in this report. Respectfully submitted.

C. R. ANDERSON,  
*Chief of the Surveys and Investigations Staff.*

#### I. INTRODUCTION

##### A. Directive

By directive dated February 22, 1973, the committee requested that an investigation be made into the Navy's cold iron program. The investigation was to include, but not be limited to, the total costs involved in implementing the cold iron program; the benefits which are expected or have been experienced from this program; the effect of the program on leave and assignment schedules of Navy personnel; and the expected utilization of existing or proposed facilities. In addition, a detailed examination was to be made of the requirements for the Cold Iron projects included in the Navy's fiscal year 1974 military construction program.

##### B. The cold iron program concept

The Navy's cold iron program is a multiyear military construction program to provide pier berthing and shore-based utilities for ships returning to their homeports after extended deployments (120 days or more). The shore-based

provision of utilities, such as electricity, steam, potable water, and compressed air will enable such ships to shut down boilers and utility generating equipment and enter into a 100 percent cold iron status for a period of about 30 days upon returning to homeports.

The principal objectives of the program are to improve the watch assignment schedules of crew members, to reduce fuel consumption and equipment operating time aboard ships in port, and to increase the time available for preventive maintenance which cannot be accomplished while boilers and steamlines are hot and generators are in operation.

The improvement of watch assignment schedules is considered by the Navy to be of particular importance in connection with the current emphasis on attracting and retaining personnel under the all-volunteer forces concept.

### *C. Background*

The utilization of shore-based cold iron facilities for ships in port is not new to the Navy. For many years, limited auxiliary utility services have been afforded ships by portable generators or "donkey boilers" placed on the piers. The introduction of the cold iron program as a major directed Navy construction effort, however, was first discussed in 1964 when a series of in-house studies were initiated to determine the feasibility and cost-effectiveness of establishing permanent, shore-based facilities for providing utilities to ships in homeport.

Initial studies led to an in-depth total systems engineering study effort and, in fiscal year 1969, the Chief of Naval Operations promulgated a Navy-approved cold iron program for a 5-year construction effort totaling approximately \$124 million. It was further decided that, until permanent facilities were installed, Mobile Utilities Support Equipment (MUSE) would be utilized as a temporary means of providing cold iron services. During fiscal year's 1971-73, about \$12.5 million was allocated for MUSE.

## II. PROPOSED AND EXISTING COLD IRON FACILITIES

### *A. Proposed fiscal year 1974 projects*

The fiscal year 1974 military construction program for the Navy includes requests for funds totaling \$35.873 million for the construction or installation of cold iron facilities at seven Navy installations. The work to be accomplished at each installation and the costs for each project are set forth hereinafter.

#### *Naval Station, Norfolk, Va.*

Project No. 373 is to provide a new 1,400 foot berthing pier, including dredging of the new pier area, with cold iron utilities and 40-foot deep slips on each side, to accommodate principally large fleet oilers, a repair ship, and ships undergoing repair. The project also is to provide for roadway and railroad tracks to the pier, a new parking lot, construction of a bulkhead, and the following supporting facilities: electrical substation and distribution line, telephone and fire alarm systems, potable water distribution lines, fuel oil line, steam distribution system, sewage pump station, and oil spillage control. A deficiency currently exists in the required linear feet of berthing space due to the changing composition of ships in the fleet, wherein new ships of greater length are being placed in commission. The estimated cost of the proposed project is \$9.624 million.

Project No. 732 is to provide additional electrical, steam, and water outlets on two piers, and to increase the electrical capacity on one pier. This project is also to modernize existing electrical outlets and improve vault ventilation on three piers, used mainly by nuclear submarines, tenders, and escorts, so that ships in port can shut down onboard plants and assume a cold iron condition. The cost of this estimated project is \$2.057 million. Increased numbers of new SSN 688 class submarines are being assigned and one pier needs an increased power source to service them.

#### *Naval Station, San Diego, Calif.*

Project No. 182 with an estimated cost of \$10 million is required to accommodate nuclear-driven surface ships which are being transferred to San Diego due to the closure of the naval station at Long Beach. This project includes the construction of a 1,480-foot reinforced concrete pier with utility tunnels on both sides, dredging of the new pier area, and the following supporting facilities: electrical distribution line, telephone and fire alarm systems, steam distribution line, compressed air plant and distribution line, fresh and salt water distribution systems, and a wastewater collection system.

Project No. 141 includes the removal of inadequate electrical, fresh and salt water, and steam systems. Also, it is to provide for the following pier improve-

ments: structural repairs, stationary switchgear, electrical distribution system, telephone cable revisions, fresh and salt water distribution systems, and steam distribution system. This project is to cost \$1.996 million and is required so as to enable ships berthed at one pier to shut down boilers and machinery when entering port, thereby permitting the timely performance of repairs and preventive maintenance by a minimum crew.

*Naval Air Station, Alameda, Calif.*

Project No. 068 has an estimated cost of \$3.827 million and includes constructing a masonry steam and compressed air plant; providing a salt water pumping station for fire protection, flushing, and cooling requirements; providing two mooring platforms at the end of one pier with connecting catwalks; providing utility outlet stations and distribution systems on the pier for steam, potable water, salt water, fuel, and compressed air; and providing two electrical substations including switchgear and conductors. This project will complete a program to provide all ships' utilities needs from shore facilities so that maintenance of the ships' utility generating equipment may be performed. Only partial utility services can now be provided, necessitating operation of some of the ships' utility generating equipment.

*Naval Ship Repair Facility, Guam, Mariana Islands*

Project No. 901 is to provide wharf utilities including: electrical substations and distribution lines; telephone services modifications; steam plant and distribution lines; compressed air plant and distribution line; potable water distribution line; security lighting; saltwater pump station and distribution lines; equipment shed; and concrete trench. This project is estimated to cost \$2.782 million and is required to provide adequate support to the homeported ships so they will not be required to generate their own steam and electrical power.

*Navy Public Works Center, San Diego, Calif.*

Project No. 020 is for construction of an 11,920-linear-foot steam distribution system; including installing steam distribution piping varying from 4 to 18 inches in diameter, providing cathodic protection, manholes, pressure-reducing stations, high-pressure drip line, and valve assemblies. The project is expected to cost \$2.471 million and will upgrade the existing steam distribution system which has extremely high thermal losses which render it incapable of delivering steam in the required quantities at the correct pressure.

*Navy Public Works Center, Pearl Harbor, Hawaii*

Project No. 408 is for additional pier utilities including: constructing new electrical substation structures for four berths; installing two banks of dock outlets on each of these berths including complete secondary systems; providing telephone and industrial power outlets; modifying one station; installing tie cables and switchgears; and providing an air drying system with fencing. The proposed cost of this project is \$1.863 million. The project is to upgrade the existing undersized electrical distribution system which prohibits many of the ships from going cold iron and prevents the accomplishment of maintenance services on equipment and the implementation of a liberal leave policy to promote personnel morale.

*Naval Submarine Support Facility, San Diego, Calif.*

Project No. 999 is for construction of pier utility services, including: electrical distribution lines, electrical transformer and associated low-voltage switchgear, steam distribution lines, and compressed air distribution lines. Currently there are no steam or compressed air lines on the piers and the existing electrical distribution lines are not fed by transformers and switching stations ashore that have sufficient capacity for the loads imposed by ships in port. This project is estimated to cost \$1.253 million.

*B. Summary of existing and proposed cold iron program projects*

Although the Navy considers fiscal year 1972 to have been the first year of the cold iron program as a directed, formalized 5-year program, appropriations were previously requested and received in fiscal years 1969 and 1971 for construction of facilities identified as cold iron line items in the budget submissions. No cold iron funds were requested or received in fiscal year 1970.

Navy officials also made available the projected requirements for cold iron military construction to be submitted in the fiscal year 1975 Navy budget. Accord-

ing to the Navy officials, if the cold iron funds requested for fiscal years 1974-75 are made available, the cold iron program will be terminated as a dominant Navy construction program and any future requirements would become competitive with other military construction projects for funding on the basis of individual priority.

The following is a tabulation of existing or proposed cold iron projects which have been funded or will be proposed for funding from fiscal years 1969 through 1975, excluding fiscal year 1970:

Activity and project	Cost (thou- sands)	Status
<b>FISCAL YEAR 1969</b>		
Naval air station, Quonset Point, R.I.: Pier utilities.....	\$519	Completed.
Naval station, San Diego, Calif.: Pier modernization.....	1,382	
Fiscal year 1969 total.....	<u>1,901</u>	
<b>FISCAL YEAR 1971</b>		
Naval submarine base, New London, Conn.: New pier.....	1,813	Completion, July 1973.
Naval submarine base, New London, Conn.: Pier utilities.....	239	Completed.
Naval ship repair center, Guam: Wharves/utilities.....	740	Do.
Naval submarine base, Pearl Harbor, Hawaii: Improve berths.....	2,255	95 percent complete.
Naval construction battalion center, Port Hueneme, Calif.: New piers.....	3,000	Completed.
Naval station, Norfolk, Va.: Dredge pier 12.....	595	Do.
Fiscal year 1971 total.....	<u>8,642</u>	
<b>FISCAL YEAR 1972</b>		
Naval submarine base, New Haven, Conn.: Pier and quay repairs.....	600	Completion June 1973.
Naval air station, North Island, Calif.: Pier utilities.....	1,720	50 percent complete.
Fiscal year 1972 total.....	<u>2,320</u>	
<b>FISCAL YEAR 1973</b>		
Naval amphibious base, Little Creek, Va.: Electrical distribution.....	366	Completion February 1975.
Naval amphibious base, Little Creek, Va.: Pier utilities.....	719	Do.
Naval submarine base, New London, Conn.: Powerplant expansion.....	2,615	Contract awarded April 1973.
Public works center, Newport, R.I.: Utilities for auxiliary dock.....	546	Design.
Naval station, Norfolk, Va.: Pier utilities.....	1,381	Completion December 1974.
Public works center, Norfolk, Va.: Steamplant expansion.....	2,326	Contract award May 1973.
Naval submarine base, Pearl Harbor, Hawaii: Pier utilities.....	1,682	Contract award June 1973.
Naval air station, Pensacola, Fla.: Pier utilities.....	521	Completion January 1974.
Public works center, San Diego, Calif.: Steamplant.....	1,758	Plans 95 percent complete.
Naval air station, Alameda, Calif.: Pier extension and utilities.....	1,784	Contract award April 1973.
Naval station, Charleston, S.C.: Improve berths.....	3,452	Completion August 1974.
Naval air station, North Island, Calif.: Pier utilities.....	3,271	Contract award April 1973.
Naval submarine support facility, San Diego, Calif.: Pier extensions and utilities.....	390	Completion October 1973.
Naval station, San Diego, Calif.: Pier utilities.....	2,660	Bids opened March 1973.
Fiscal year 1973 total.....	<u>23,471</u>	
<b>FISCAL YEAR 1974</b>		
Naval air station, Alameda, Calif.: Pier utilities.....	3,827	Congressional submittal.
Naval station, Guam: Wharf utilities.....	2,782	Do.
Naval station, Norfolk, Va.: Pier utilities and new pier.....	11,681	Do.
Public works center, Pearl Harbor, Hawaii: Wharf utilities.....	1,863	Do.
Naval submarine support facility, San Diego, Calif.: Pier utilities.....	1,253	Do.
Naval station, San Diego, Calif.: Pier utilities and new pier.....	11,986	Do.
Public works center, San Diego, Calif.: Steam distribution system.....	2,471	Do.
Fiscal year 1974 total.....	<u>35,873</u>	
<b>FISCAL YEAR 1975 (PROJECTED)</b>		
Naval amphibious base, Little Creek, Va.: Dredge channel and extend piers.....	2,016	Planning.
Naval station, Norfolk, Va.: Pier utilities and dredging.....	3,170	Do.
Naval submarine base, New London, Conn.: New pier.....	4,959	Do.
Naval station, San Diego, Calif.: Pier utilities.....	4,146	Do.
Naval submarine support facility, San Diego, Calif.: New pier.....	3,546	Do.
Public works center, San Diego, Calif.: Steam distribution.....	1,798	Do.
Naval station, Charleston, S.C.: Additional berthing.....	2,307	Do.
Fiscal year 1975 total (projected).....	<u>21,942</u>	

The total cost of the above listed existing and proposed projects under the cold iron program is \$94,149,000. It should be noted, however, that this cold iron program cost figure does not truly represent a total cost for all past or future requirements for the construction or utilization of cold iron-type facilities or equipment. In other words, the \$94.1 million figure represents only those projects constructed or planned specifically under the major, directed cold iron program.

Over a great many years, bits and pieces of various types of equipment or facilities used to produce steam, electricity, fresh and salt water, and other ship utilities have been installed or temporarily placed on piers to provide ships with limited amounts of what is now referred to as cold iron services. In addition, the fact that the Navy now tentatively plans to terminate the cold iron program as a directed, major construction program as of the end of fiscal year 1975, does not mean there will be no additional requirements for cold iron-type utilities in future years. As a matter of fact, a review of the most recent print out of the Navy "Military Construction Program Objectives," dated October 1, 1972, identified 37 construction projects to be considered for the fiscal year 1976 through fiscal year 1979 timeframe which will provide additional cold iron-type facilities at an estimated total cost of \$73.618 million.

If these out-year projects were subsequently to be approved, this would represent a total expenditure of about \$167.77 million for cold iron-type facilities during the period fiscal years 1969-79. Added to this total would be the costs of such facilities constructed prior to fiscal year 1969, the considerable costs of collateral equipment (hoses, cranes, neoprene suits, et cetera, procured with OPN funds) which must be purchased to operate the cold iron systems, and the significant expenditures for MUSE.

#### *C. Mobile Utilities Support Equipment (MUSE)*

As of November 15, 1972, the Navy had about \$30.5 million in MUSE assets. Of these assets, \$9.6 million worth of equipment (valued at fiscal year 1973 replacement costs) has been designated specifically for use in the cold iron program. During fiscal years 1971-73, an additional \$12.5 million has been allocated to the procurement of 103 new MUSE units for use in the cold iron program. Only four of the new units are in place—the remainder being in the procurement pipeline.

Except for emergency situations or unusual requirements, such as the contemplated utilization of MUSE at the Navy homeport in Athens, Greece, Navy plans call for discontinuing MUSE services once permanent cold iron facilities become operable. The approximately \$22.1 million in MUSE equipment designated for cold iron will, for the most part, be returned to the inventory.

Despite the fact that all the MUSE has been purchased with other procurement Navy funds and not with military construction funds under the cold iron program, the \$22.1 million is being added to the \$167.77 million in projected costs for proposed cold iron projects in order to provide insight into the magnitude of total expenditures for cold iron-type equipment or facilities. The resulting total is approximately \$189.87 million.

### III. EFFECT OF COLD IRON ON LEAVE AND ASSIGNMENT SCHEDULES

In discussing advantages of the cold iron program, Navy officials stressed the importance of improving crew morale, and thereby enhancing the retention rates of enlisted personnel, as the result of reduced watch assignments brought about by entering into a cold iron status while in homeport. A policy objective was established by the Chief of Naval Operations in fiscal year 1970 to the effect that each ship returning to homeport after an extended deployment of more than 120 days should be permitted to enter into a cold iron status for the first 30 days, thereby providing opportunities for optimum leave and liberty privileges for the crews.

It was noted in a report issued by the Secretary of the Navy's Retention Task Force that about 48 percent of the ships in the fleet that are currently using a three or four section duty rotation (must perform extra duty every third and fourth day) while in port, could achieve a five or six section duty rotation if cold iron facilities were available.

The adverse effects of keeping a ship under steam while in port are considered particularly unfavorable with respect to the duty rotation of engineering personnel (machinist mates, boiler technicians, enginemen, et cetera). Usually, the rest of the crew enjoys six section duty rotation while in port even if the ship is not in cold iron status. At the same time, however, engineering personnel are

required to stand watch every third or fourth day if cold iron is not available. Hopefully, permanent cold iron facilities will eliminate these inequities and improve the retention rate of enlisted engineering personnel which is extremely low (16.4 percent compared to an overall Navy average enlisted first-term retention rate of 21.2 percent).

As may be noted from the tabulation of existing and proposed cold iron projects previously set forth in this report, the majority of the facilities have not been constructed. Therefore, it is not possible to precisely determine actual retention benefits or the effect on leave and liberty privileges experienced from existing cold iron facilities. During its field visits, the investigative staff was furnished the following data which predicts the expected impact of cold iron on the duty scheduling of the engineering departments of several aircraft carriers:

#### *USS Enterprise*

The provision of cold iron will allow 40 percent (200 men) of the engineering department (500 men) to be on leave at one time; compared to about 10 percent (50 men) on leave without cold iron. This is an increase of 30 percent from non-cold-iron status allowing an additional 150 men to be on leave at one time.

With cold iron, a five-section watch would be utilized for the remaining 60 percent of engineering crew members, amounting to 100 men on duty at one time. Without cold iron, a three-section watch of 170 men would be required. In other words, these men would be off duty 4 out of 5 nights under cold iron and 2 out of 3 nights without it.

#### *USS Ranger*

Under cold iron, an estimated 40 percent (120 men) of the engineering department (300 men) could be granted leave; compared to about 10 percent (30 men) granted leave without cold iron. This is an increase of 30 percent from non-cold-iron, allowing an additional 90 men to be on leave at the same time.

A five-section watch (60 men on duty) would be utilized under cold iron, while without cold iron, a three-section watch of 100 men would be required.

#### *U.S.S. Oriskany*

Cold iron would allow 50 percent (130 men) of the engineering department (260 men) to be on leave at one time; compared to about 10 percent (26 men) on leave without cold iron. This is an increase of 40 percent from non-cold-iron, allowing an additional 104 men to be on leave at the same time.

With cold iron, a 5-section watch would be utilized, amounting to 52 men on duty. Without cold iron, a 3-section watch of approximately 87 men would be required.

#### *U.S.S. Hancock*

Cold iron would allow 50 percent (130 men) of the engineering department (260 men) to be on leave; as opposed to about 10 percent (26 men) on leave without cold iron. This 40-percent increase would allow an additional 104 men to be on leave at one time.

A 6-section watch would be utilized, amounting to approximately 45 men on duty with cold iron. Without cold iron, a 3-section watch of approximately 89 men would be required.

#### *U.S.S. Midway*

About 50 percent (70 men) of the engineering department (140 men) would be allowed leave under cold iron; compared to about 10 percent (14 men) allowed leave under non-cold-iron. This 40-percent increase allows an additional 56 men to be on leave at the same time.

Under cold iron, a 6-section watch would be utilized, amounting to 23.5 men on duty. Without cold iron, a 4-section watch of 47 men would be required.

With regard to the leave and liberty implications of cold iron, the investigative staff believes there is a need to clarify the Navy's use of Liberty man-days (LMD's) as applied to cold iron program planning. Reviews of the Navy fiscal year 1972-73 military construction hearings before the Commission on Appropriations, House of Representatives, disclosed that frequent reference was made to LMD savings to be gained from cold iron. The inference was that crew members would receive many more days off, or that some sort of dollar savings may accrue from these LMD's. This is misleading—crew members receive the same pay whether on liberty or on duty and will still be required to work a 40-hour week plus whatever watch duty is assigned. The actual significance of reducing watch requirements from a 1-day-in-3 ratio a 1-day-in-6 ratio is that a man

would become available for preventive maintenance work, repair work, or other routine duties for a full extra day. Instead of LMD's, a descriptive term of maintenance man-days would seem more appropriate.

Navy officials advised there was no intention to use increased LMD's as either a justification for cold iron or as representing a savings. According to these officials, LMD's were used as factors in cold iron studies for the purpose of establishing priorities as to which project would be constructed first.

Navy officials further advised that, once the proposed cold iron facilities are operable, they will be fully utilized on a continuing basis. This is considered particularly probable in view of recent base closures and the cessation of hostilities in Southeast Asia whereby a greater number of ships are spending longer periods of time in homeports.

#### IV. POTENTIAL COLD IRON BENEFITS

The principal benefits which are expected to be derived from permanent cold iron facilities were identified by Navy officials and from Navy records as follows:

1. Reduced watch standing requirements which contributes to:
  - (a) Improved fleet readiness by freeing engineering personnel to perform maintenance work.
  - (b) Improved morale and retention rates by providing more liberal and equitable leave and liberty policies.
  - (c) Increased time available for training personnel.
2. Allows maintenance work to be performed on steam systems, electrical systems, and diesel driven systems which could not be accomplished if a ship was required to "steam" auxiliary equipment for power to operate utilities.
3. Reduced maintenance requirements because machinery operating time would decrease.
4. Prolonged equipment life due to reduced operating time.
5. Reduced shipboard fuel consumption which leads to:
  - (a) Decreased fuel costs.
  - (b) Decreased costs of refueling operations.
  - (c) Reduced pollution from accidental spills during refueling and attendant costs of cleanup.
  - (d) Reduced pollution from stack emissions.
  - (e) Reduced requirements for pumping out oily bilge water.
6. Reduced overall costs of providing utilities to ships.

With respect to the last anticipated benefit listed, Navy officials are convinced there will be significant savings as a result of providing utilities from permanent shore facilities. They contend, however, that it is not possible to precisely document comparative costs because of a great many intangibles involved in determining ship operating costs.

The costs of shore-generated electricity or steam can be determined precisely because the costs of the facilities and their amortization rates are known, rates charged by civilian powerplants are known, and the wages of civilian employees operating the equipment are known. Ship boilers and generators, however, are designed and built for the primary purposes of propelling and controlling ships. In a sense, the generation of steam for galleys and laundries, and electricity for lights and air-conditioning are ancillary benefits. In addition, unlike the employees of shore facilities, crew members receive their salaries whether or not they are actually operating equipment to produce power for utilities. Added to these intangibles are other unmeasurable factors such as reduced wear and tear on equipment, reduced spare parts requirements, additional time to perform preventive maintenance while under cold iron, and numerous other considerations.

#### V. OBSERVATIONS

##### A. Cold iron as a catchall

From a review of military construction project data, it appears that many cold iron projects have been, or will be, used as catchalls for a variety of investment items which would ordinarily be included in other major construction programs, or would have to compete for priority with other independent construction requirements. As one example, in addition to the installation of utilities, the proposed fiscal year 1974 cold iron project (P-373) at the naval station, Norfolk, Va., includes construction of a roadway and railroad tracks to the new pier, a new parking lot, oil spillage control facilities, and a new sewage pumping station and force main for the ship waste water collection system.

Inasmuch as the investigative staff is aware of the interest shown by the Committee on Appropriations, House of Representatives, in the total costs of the Navy's major construction program to provide ship waste water collection facilities, the inclusion of such costs in the cold iron program was of interest. Cold iron projects for fiscal year 1974 alone, included plans to expand \$698,000 for ship waste water collection facilities at new piers being built for cold iron. This means these costs will not be visible in another major Navy construction program.

At Port Hueneme, Calif., fiscal year 1971 cold iron program funds totaling \$3 million were expended for the construction of three new piers. There were no cold iron-type facilities of any sort included in this project for installation on these piers. During interviews at Port Hueneme, Navy officials were astonished to learn that this construction project had been included in the cold iron program. Officials of the Naval Facilities Engineering Command later advised that this project had apparently "slipped" into the cold iron program.

At the naval submarine support facility, San Diego, Calif., \$50,000 in fiscal year 1973 cold iron funds were allocated for construction of a gantry crane platform adjacent to a pier and procurement of a gantry crane to be used in loading ships. When asked to explain why this should be considered a cold iron project, a Navy official replied that, in his opinion, anything in a pier area that releases men for other duties is cold iron.

It is not the contention of the investigative staff that the foregoing actions were taken to deceive anyone, or to circumvent prescribed procedures for requesting military construction funds. It is believed conceivable, however, that since the Committee on Appropriations, House of Representatives, has been receptive to the cold iron program and has appropriated the funds requested in the past few years, the Navy may be capitalizing on an opportunity to include certain items which would ordinarily remain on the "wish list."

#### *B. Coordination of construction*

In explaining the high costs of simply extending utilities from existing base facilities to piers for cold iron services, Navy officials commented on the expense involved in getting in under piers to install steam, electrical, and water lines. It occurred to the investigative staff that the same circumstances were applicable to the installation of sewerage lines for the ship waste water collection project which was investigated in connection with the Navy's fiscal year 1973 military construction program. Navy officials were questioned as to whether any attention had been given to coordinating the installation of cold iron utility lines and sewerage collection lines under the piers.

It was found that this possibility had occurred to public works officials at the Naval Station, San Diego. A master contract had been awarded for all projects on one pier to avoid a conflict of several contractors attempting to work simultaneously under a pier, or having one contractor dig up an area on a quay wall which had just been filled in by another contractor. This coordination of similar projects is also expected to reduce the pier downtime and be more economical.

This approach had apparently not occurred to officials of the Western Division, Naval Facilities Engineering Command, who seemed interested once the possibility was mentioned, or to Navy engineering officials at the Naval Air Station, Alameda, Calif., who have already awarded separate contracts for the cold iron and waste water collection projects.

The investigative staff was unable to determine the status of cold iron/waste water collection projects at numerous other Navy home ports in time for inclusion in this report. The potential advantages of coordinating these efforts wherever possible, however, were brought to the attention of officials of the Naval Facilities Engineering Command Headquarters, for their consideration.

#### BASE CLOSURE IMPACT ON COLD IRON

Mr. PATTEN. To what extent will the recently announced base closures affect the proposed construction of cold iron type facilities for the fiscal year 1976 through the fiscal year 1979 time frame?

Captain WATSON. Mr. Chairman, there was approximately \$19 million worth of projects removed from the total cold iron program as a result of the base closure.

Reviewing the total cold iron program, it presently appears that about \$33 million worth of projects will be in the 1975 program, and about \$18 million in the 1976 program of hard, urgently required cold iron. The remaining cold iron projects are nice to have projects that will compete with the rest of the Navy's various projects for the dollars available.

#### MUSE EQUIPMENT

Mr. PATTEN. What uses are planned for the multiple utilities services equipment (MUSE) to be returned to inventory?

Commander KIRKPATRICK. We have no immediate use planned. Our standard method of operation is that it will be used to take care of peak loads or emergencies and then returned to inventory.

Admiral MARSCHALL. We have found this one of the most valuable tools we own. We have requirements that spring up rather quickly on us and with this pool of mobile equipment we can get the requirements satisfied rather quickly, shipping it out by air generally, to the spot where it is needed. It is a very valuable tool.

Mr. PATTEN. You do not plan to sell it. You are putting it in the dead file.

Admiral MARSCHALL. No, sir. At the present time we probably have more requirements for this equipment than we have had for several years. This is a healthy state of affairs up to a point, because unless we do rotate the equipment its use is no longer justified.

Mr. PATTEN. Do you have any comparative cost figures for producing steam and electricity by cold iron, MUSE, and the ship steaming?

Captain WATSON. Data on operating cost show costs differ by a factor of three in favor of shore utility sources. This looks at fuel and other operating costs only and does not consider capital investment costs discounted over the plant life time.

In looking at capital investment cost, it is difficult to isolate capital investment in ships and plants related to cold iron utilities production. Looking at discounted life time personnel costs it is difficult to isolate military personnel costs for operating ship plants in a cold iron state. But you are saying it would not pay to bring the *Enterprise* in and generate electricity through their nuclear plant to supply your needs here. It would be three times as expensive.

Admiral MARSCHALL. And probably more than that with the *Enterprise* because you build a lot more than a powerplant when you build a ship of that nature.

Mr. PATTEN. Yes, of course, if you are going to write the ship off—you would have a billion dollar item.

Captain WATSON. It is a specialized plant designed for a certain specific purpose.

#### COLD IRON SCOPE

Mr. PATTEN. Should not certain items, such as ship waste water collection facilities, be presented as separate Navy construction programs rather than included under cold iron?

Admiral MARSCHALL. It is all part of the package, Mr. Chairman. They have added certain waste water collection systems under the pollution abatement program. It is a matter of choice coming to the committee for these particular things.

A new pier is all within the same request. An old pier, you do it a little differently.

Mr. PATTEN. The staff report indicates that cold iron projects for fiscal year 1974 alone included expenditures for \$698,000 for such facilities, which would not be visible in another major Navy construction program.

#### WASTE DISPOSAL

Admiral, I don't know whether this is your line or not, but we started out with solid waste projects many years ago. Have there been any improvements? Are you doing anything better?

Admiral MARSCHALL. We are doing some things better. For example, in 1967 we completed an incinerator which provides boiler steam for ships at piers in Norfolk. We are planning, I think, two more of those. As a matter of fact, we have equated, I think, 1 ton of refuse to about 60 gallons of fuel in this process and it takes care of two problems. It takes care of the waste removal proposition and it gives us a byproduct of steam which we can use for purposes around the piers.

I think we have two more in our planning stages now. I just visited that facility the other day.

Mr. PATTEN. Assume we do all these things. Is the river down there going to be improved from the sanitary point of view?

Admiral MARSCHALL. I think it is going to improve it considerably; yes, sir.

#### SCOPE OF COLD IRON UMBRELLA

Mr. PATTEN. Why was the \$3 million fiscal year 1971 project 008 at Port Hueneme, Calif., considered for funding as a cold iron project? P-008 was for the construction of three new piers with no cold iron facilities of any sort included. It represented over one-third of the fiscal year 1971 cold iron funding, \$3 million of \$8,642,000.

Mr. MURPHY. In our fiscal year 1971 program we referred to those wharves at Port Hueneme as cold iron, in that they provided facilities for a ship to come into shore. We defined that as cold iron even though it did not provide utilities as such. It provided the physical means to berth a ship and for that reason we felt it was in the cold iron category. We haven't had any of that category of project since and Hueneme is unusual in that it only serves range ships working with the adjacent Point Mugu range and these are not ones that we provide cold iron as we provide for the fleet.

#### COORDINATION OF CONSTRUCTION FOR COLD IRON AND SHIP WASTE WATER COLLECTION

Mr. PATTEN. Are any efforts being made to coordinate installation of cold iron facilities and ship waste water collection systems where that is applicable?

Admiral MARSCHALL. Yes, sir.

Mr. PATTEN. The staff report indicates that the Naval Air Station, Alameda, Calif., has already awarded separate contracts for the cold iron and waste water collection projects.

Would you comment on that?

Provide that for the record.

[The information follows:]

Consideration was given to combining the fiscal year 1973 cold iron and waste water collection projects into a single contract. However, analysis of the design scheduling indicated that a 3- to 4-month delay in the execution of the cold iron projects would occur if combined contractually with the waste water collection project. Such a delay was not considered to be in the best interest of the Navy. Accordingly, the decision was made to award a single contract for the cold iron projects and a separate contract for the waste water collection project. However, this decision was not reached until it had been determined that the work involved in both cases would not cause conflicts in construction scheduling or duplication in construction efforts. It is considered that no appreciable savings would have resulted in combining the two projects into one contract.

#### SONAR SCHOOL RELOCATION

Mr. PATTEN. You are requesting \$3,950,000 for an applied instruction building for the Fleet Sonar School to be relocated here from Key West. What are the costs and savings of this relocation?

Admiral MARSCHALL. We have only with us at this time the total savings for the closing of the Key West Naval Station, Mr. Chairman. We estimate those to be \$7.5 million a year as opposed to the one-time closeout cost of about \$12.5 million.

We do require, as a result of this move, in fiscal year 1974, \$4.4 million for facility construction and in the next year, fiscal year 1975, \$3.6 million.

Mr. NICHOLAS. Would there be any point in keeping the Sonar School at Key West if the other functions move out?

Captain WATSON. The Fleet Sonar School is primarily supporting the fleet and training the sonar technicians. The best location is where the fleet is. The west coast has the same type school located in San Diego. At Key West there were ships home ported there at one time which operated and took the students out. By having the school located in Norfolk, there was a definite savings in transportation. The ships can send the students directly to the school, either for the short 2-week, or 3-week courses. With the 20-week courses it doesn't make that much difference.

Mr. PATTEN. Would you be able to analyze whether there is a separate saving for this move as opposed to total closure of Key West?

Admiral MARSCHALL. I believe it is all part of one package.

#### EXECUTIVE SESSION VOTED

Mr. PATTEN. Let me interrupt here for a procedural matter. I move that tomorrow, Wednesday, July 11, the meeting of the Military Construction Subcommittee be held in executive session to permit discussion of Navy research and development activities which are of a classified nature and to consider classified items being requested in the Navy's fiscal year 1974 program.

Mr. SIKES. Mr. Clerk, would you call the roll?

Mr. NICHOLAS. Mr. Sikes?

Mr. SIKES. Aye.

Mr. NICHOLAS. Mr. Patten?

Mr. PATTEN. Aye.

Mr. NICHOLAS. Mr. McKay?

Mr. MCKAY. Aye.

Mr. NICHOLAS. Mr. Davis?

Mr. DAVIS. Aye.

Mr. NICHOLAS. Mr. McEwen?

Mr. McEWEN. Aye.

Mr. SIKES. The majority having voted in favor of the motion, it is approved. Please continue the questioning, Mr. Patten.

POSSIBLE USE OF EXISTING FACILITIES FOR TRAINING

Mr. PATTEN. Have you looked at all existing facilities at Norfolk, in addition to the space to be vacated in the present messhall, to determine whether this function can be entirely accommodated in existing space?

Captain WATSON. Yes, sir. We have looked at a number of locations. Dam Neck, Orlando, and Charleston, as well as looking at the naval station at Norfolk to see if there are additional buildings that could accommodate the school and there were none. The main driving force is the location near the fleet and Norfolk has no building large enough to support the school.

Mr. PATTEN. How long have you looked?

Captain WATSON. About 8 months, during the SER study.

Mr. PATTEN. This has no relationship, then, to your regular sonar operation, which I saw in San Francisco? Are we talking about a school?

Captain WATSON. Yes, sir. They have 14 class A schools which run about 10 months teaching the basic sonar operations for the different classes of sonars, the passive classification, submarine sonar technician, surface-sonar technician, ocean systems technician. All the sonar operator specialties as well as the class A schools.

Then they have 19 class C schools which run 2 weeks or more. These are short courses that specialized in one particular aspect of sonar maintenance, operation, or advanced ASW systems technology. In addition there are some maintenance and 3M manager courses.

Mr. PATTEN. Are there any peculiar requirements associated with this facility or will it be ordinary classroom type construction?

Commander KIRKPATRICK. It is basically classroom instruction. There is no special construction. There are some large spaces to take care of it.

Captain WATSON. The sonar trainers used need a raised flooring in the building so the cabling and sonar equipment can be installed.

Mr. PATTEN. Are there any questions about this project?

NAVY PUBLIC WORKS CENTER, NORFOLK, VA.

Mr. PATTEN. We will now turn to the Navy Public Works Center, Norfolk, Va.

Insert page I-72 in the record.

[The page follows:]

1. DATE 5 MAR 1973		2. DEPARTMENT NAVY		3. INSTALLATION FY 19 74 MILITARY CONSTRUCTION PROGRAM			5. INSTALLATION NAVY PUBLIC WORKS CENTER				
4. COMMAND OR MANAGEMENT BUREAU NAVAL FACILITIES ENGINEERING COMMAND			6. INSTALLATION CONTROL NUMBER 5118-500		8. STATE/COUNTRY NORFOLK, VIRGINIA						
7. STATUS ACTIVE			9. YEAR OF INITIAL OCCUPANCY 1948		9. COUNTY (U.S.) INDEPENDENT CITY		10. NEAREST CITY WITHIN CITY				
11. MISSION OR MAJOR FUNCTIONS To provide public works, public utilities, public housing, transportation support, engineering services shore facilities planning support and all other logistic support of a public works nature incident thereto, required by the operating forces, independent activities and other commands served by the Public Works Center.  Major Activities Supported: Naval Station Family Housing Naval Air Station Naval Supply Center Commander in Chief Atlantic Fleet Headquarters and about 100 minor activities and commands				12. PERSONNEL STRENGTH			STUDENTS		SUPPORTED		TOTAL (9)
				OFFICER (1)	ENLISTED (2)	CIVILIAN (3)	OFFICER (4)	ENLISTED (5)	OFFICER (6)	ENLISTED (7)	
				a. AS OF 31 December 1972	16	2	1,774	0	0	0	0
b. PLANNED (END FY 1975)	16	7	1,725	0	0	0	0	0	1,733		
13. INVENTORY											
LAND		ACRES (1)	LAND COST (\$000) (2)		IMPROVEMENT (\$000) (3)		TOTAL (\$000) (4)				
a. OWNED		849	737		82,657		82,364				
b. LEASES AND EASEMENTS		35* - 15#	13* - 11#		1,753		1,764				
c. INVENTORY TOTAL (Except land rent) AS OF 30 JUNE 19 72						85,152					
d. AUTHORIZATION NOT YET IN INVENTORY						6,244					
e. AUTHORIZATION REQUESTED IN THIS PROGRAM						89 1/2					
f. ESTIMATED AUTHORIZATION - NEXT 4 YEARS						6,561					
g. GRAND TOTAL (c + d + e + f)						100,855					
14. SUMMARY OF INSTALLATION PROJECTS											
PROJECT DESIGNATION				TENANT COMMAND PRIORITY	UNIT OF MEASURE	AUTHORIZATION PROGRAM		FUNDING PROGRAM			
CATEGORY CODE NO. a	PROJECT TITLE b					SCOPE c	ESTIMATED COST (\$000) e	SCOPE d	ESTIMATED COST (\$000) h		
812.30	ELECTRICAL DISTRIBUTION SYSTEM (5TH INCR)			64	LS	-	567	-	567		
1/ INCLUDES \$325,000 FOR POLLUTION ABATEMENT											

## NAVY PUBLIC WORKS CENTER, NORFOLK, VA., \$567,000

This center provides utilities to facilities located within the Sewells Point naval complex and to the fleet ships berthed at the naval station, Norfolk.

The electrical distribution system project will extend existing electrical distribution lines and provide additional capacity to satisfy increased power demands of new modern production equipment, larger modern fleet ships, and new facilities.

## Status of funds:

Cumulative appropriations through fiscal year 1973-----	\$22, 626, 000
Cumulative obligations, Dec. 31, 1972 (actual)-----	16, 810, 003
Cumulative obligations, June 30, 1973 (estimated)-----	19, 108, 861

*Design Information*

Project: Electrical distribution system

Design cost-----	\$6, 000
Percent complete April, 1973-----	15

Mr. PATTEN. Can you show us on a map what you propose here?

Mr. MURPHY. Sir, this increment of electrical utilities improvement enables us to better distribute commercially procured power from a VEPCO source. A large part of the project will take off from a VEPCO power substation at this point and run a new feeder down this road, Hampton Boulevard, and then provide a second source of power to this pier area. This power is needed for new submarine cold-iron support. A separate project of this fiscal year 1974 program is adding power capability on the pier. This then is an adjunct to provide the primary source of that power. Also, power is routed to new NARF flight test area here.

A second portion of the project is up in the main base area itself where we are replacing transformers that are antiquated and operate at the 4,160 volt level. We want to go up to 11,000 volts, which is the modern distribution system.

Mr. PATTEN. Do you mean you buy your power from VEPCO?

Mr. MURPHY. Yes. We have a small capability within the Navy's powerplant. However, we keep that for backup for emergency loads when there is a commercial shortage. We are going more and more to commercial procurement of power.

Mr. PATTEN. This project has a low priority. Is it primarily to support existing and proposed facilities and workloads?

Admiral MARSCHALL. It is part of a continuing project, Mr. Chairman. We have 1 more year to go in this particular upgrade. Again, I will have to give you my usual speech. There are so many good competing projects that when we have to prioritize them it hurts us.

NUCLEAR WEAPONS TRAINING GROUP, ATLANTIC, NORFOLK, VA.

Mr. PATTEN. Insert page I-74 in the record.  
[The page follows]:

1. DATE 19 FEB 1973		2. DEPARTMENT NAVY		3. INSTALLATION FY 1974 MILITARY CONSTRUCTION PROGRAM			4. INSTALLATION NUCLEAR WEAPONS TRAINING GROUP, ATLANTIC		
4. COMMAND OR MANAGEMENT BUREAU COMMANDER IN CHIEF, ATLANTIC FLEET			5. INSTALLATION CONTROL NUMBER 4465-500		6. STATE/ COUNTRY NORFOLK, VIRGINIA				
7. STATUS ACTIVE		8. YEAR OF INITIAL OCCUPANCY 1959		9. COUNTY (U.S.) INDEPENDENT CITY		10. NEAREST CITY WITHIN CITY			
11. MISSION OR MAJOR FUNCTIONS Provide within the Atlantic Fleet an organization for the training of and a source of technically qualified personnel to support the nuclear weapons capability of the U. S. Atlantic Fleet and conduct training in the planning and organizational requirement for employment of nuclear, and conventional weapons.  Major Activities Supported: Nuclear Technical Proficiency Inspection Team									
12. PERSONNEL STRENGTH									
PERMANENT			STUDENTS			SUPPORTED			TOTAL
OFFICER (1)	ENLISTED (2)	CIVILIAN (3)	OFFICER (4)	ENLISTED (5)	OFFICER (6)	ENLISTED (7)	CIVILIAN (8)	(9)	(10)
A. AS OF 31 Dec 1972	45	81	6	45	37	0	0	0	214
B. PLANNED (END FY 1977)	41	84	6	45	43	0	0	0	219
13. INVENTORY									
LAND		ACRES (1)	LAND COST (\$000) (2)		IMPROVEMENT (\$000) (3)		TOTAL (\$000) (4)		
A. OWNED		1	0		212		212		
B. LEASES AND EASEMENTS		-	0		-		0		
C. INVENTORY TOTAL (Except land rent) AS OF 30 JUNE 1972							212		
D. AUTHORIZATION NOT YET IN INVENTORY							0		
E. AUTHORIZATION REQUESTED IN THIS PROGRAM							2,470		
F. ESTIMATED AUTHORIZATION - NEXT 4 YEARS							0		
G. GRAND TOTAL (c + d + e + f)							2,682		
14. SUMMARY OF INSTALLATION PROJECTS									
PROJECT DESIGNATION				TENANT COMMAND PRIORITY	UNIT OF MEASURE	AUTHORIZATION PROGRAM		FUNDING PROGRAM	
CATEGORY CODE NO.	PROJECT TITLE					SCOPE	ESTIMATED COST (\$000)	SCOPE	ESTIMATED COST (\$000)
a	b			d	e	f	g	h	
171.20	NUCLEAR TRAINING BUILDING			38	SF	47,500	2,470	47,500	2,470

**NUCLEAR WEAPONS TRAINING GROUP, ATLANTIC, NORFOLK, VA., \$2,470,000**

The Nuclear Weapons Training Group provides nuclear warfare employment training and nuclear weapons technical training for key officers and enlisted men serving in billets related to the nuclear warfare capability of the U.S. Atlantic Fleet.

The nuclear training building will provide classrooms and other spaces required for the training of officers and enlisted personnel in nuclear weapons orientation, employment, planning, work loads, and supply.

**Status of funds:**

Cumulative appropriations through fiscal year 1973-----	\$0
Cumulative obligations, Dec. 31, 1972 (actual)-----	0
Cumulative obligations, June 30, 1973 (estimated)-----	0

*Design Information*

**Project: Nuclear training building:**

Design cost-----	\$32,602
Percent complete April 1, 1973-----	99

**CINCLANTFLT COMPOUND**

Mr. PATTEN. I see that this project, which had a priority of 40 last year, has inched up to 38 this year. Has the pressure to free up this space within the CINCLANTFLT compound decreased or increased as a result of the reductions announced in this headquarters command, and the relocation of other headquarters from Newport?

Captain WATSON. It is not increasing, even though we have the relocation from Newport. We are holding the line on total numbers of people in the compound despite relocations.

Mr. NICHOLAS. Could you provide for the record the personnel of the CINCLANTFLT compound? Would that be hard to get? Show how many people you had in the CINCLANTFLT compound last year and how many you will have after the relocation has taken effect?

Captain WATSON. Right.

[The information follows:]

**CINCLANTFLT PERSONNEL STRENGTH**

During fiscal year 1973 CINCLANTFLT was subjected to the fleet staff reduction and reorganization effort applied Navywide by the CNO. Significant actions affecting Cinclantflt were adopted as follows: (1) combined Comasworlant and Comseconfit; (2) relocated Comcrudeslant from Newport to Norfolk; (3) reorganized Comnavairlant to conform to standardized Air type commander organization; (4) streamlined type commander subordinate organizations by consolidating selected unit commander staffs. These actions are not all apparent upon scrutiny of the billet count in the Cinclantflt compound, as some type commanders (Airlant and Phiblant) are not located in the compound, and some commands in the compound (Fmflant) are not Cinclantflt organizations.

The personnel strength of organizations in the compound area, projected by year, is as follows:

	Fiscal year--						
	1972	1973	1974	1975	1976	1977	1978
Military-----	3,416	3,521	3,493	3,468	3,470	3,457	3,401
Civilian-----	354	349	396	396	394	385	385

Comparing the above with forecast provided during last year's hearings, it is apparent that the surge to the 4,300 man level in fiscal year 1973 and beyond will not occur. This despite the absorption into the compound of some 273 COMCRUDESANT personnel from Newport in fiscal year 1973. A significant change in the outyear plan is the decision to locate EPDOLANT and PAMILANT (237 personnel) at New Orleans (supported by fiscal year 1974 MILCON at New Orleans) vice in the compound.

NUCLEAR WEAPONS TRAINING GROUP

Mr. PATTEN. Does this school take care of the whole Navy?

Captain WATSON. Just the east coast. On the west coast there is another school built about 1960 handling the west coast, and built at North Island. This school located in Norfolk does the same thing except it is in seven buildings. It was in five and as it gets crowded out it keeps moving out a little more into space in other buildings. The school is primarily in the old Butler Buildings at the end of the air station as well as at the CINCLANTFLT headquarters.

NAVAL AIR STATION, OCEANA, VA.

Mr. PATTEN. Insert page I-77 in the record.  
[The page follows:]

1. DATE 19 FEB 1973		2. DEPARTMENT NAVY		3. INSTALLATION FY 19 74 MILITARY CONSTRUCTION PROGRAM		4. INSTALLATION NAVAL AIR STATION								
5. COMMAND OR MANAGEMENT BUREAU COMMANDER IN CHIEF, ATLANTIC FLEET			6. INSTALLATION CONTROL NUMBER 1450-040		7. STATE/COUNTRY OCEANA, VIRGINIA									
7. STATUS ACTIVE		8. YEAR OF INITIAL OCCUPANCY 1943		9. COUNTY (U.S.) INDEPENDENT CITY		10. NEAREST CITY WITHIN CITY								
11. MISSION OR MAJOR FUNCTIONS Maintain and operate facilities and provide services and material to support operations of Aviation activities and units of the Operating Forces of the Navy and other activities and units as designated by the Chief of Naval Operations. Major Activities Supported: 3 Carrier Air Wing Commands 11 Fighter Squadrons 8 Attack Squadrons 2 Composite Squadrons 1 Aircraft Test and Evaluation Squadron Detachment Major Function: Support attack carrier fighter & medium attack squadrons				12. PERSONNEL STRENGTH		STUDENTS		SUPPORTED		TOTAL (9)				
						PERMANENT								
						OFFICER (1)	ENLISTED (2)	CIVILIAN (3)	OFFICER (4)	ENLISTED (5)	OFFICER (6)	ENLISTED (7)	CIVILIAN (8)	
				A. AS OF 31 December 1972		844	6,728	871	247	469	60	15	0	9,234
				B. PLANNED (Mid FY 1977)		959	7,342	993	228	439	54	14	0	10,029
13. INVENTORY														
LAND		ACRES (1)		LAND COST (\$000) (2)		IMPROVEMENT (\$000) (3)		TOTAL (\$000) (4)						
A. OWNED		7,995		2,633		84,226		86,859						
B. LEASE AND EASEMENT#		94* - 861#		(0* - 76#)		128* - 0#		204						
C. INVENTORY TOTAL (Except land rent) AS OF 30 JUNE 19 72								87,063						
D. AUTHORIZATION NOT YET IN INVENTORY								11,257						
E. AUTHORIZATION REQUESTED IN THIS PROGRAM								3,962						
F. ESTIMATED AUTHORIZATION - NEXT 4 YEARS								6,041						
G. GRAND TOTAL (c + d + e + f)								108,323						
14. SUMMARY OF INSTALLATION PROJECTS														
PROJECT DESIGNATION				TENANT COMMAND PRIORITY	UNIT OF MEASURE	AUTHORIZATION PROGRAM		FUNDING PROGRAM						
CATEGORY CODE NO. a	PROJECT TITLE b					SCOPE c	ESTIMATED COST (\$000) i	SCOPE d	ESTIMATED COST (\$000) h					
171.20	AIRCRAFT SYSTEMS TRAINING BUILDINGS			1	SF	68,409	3,386	68,409	3,386					
822.22	UTILITIES			81	LS	-	576	-	576					
						TOTAL	3,962		3,962					

517

Naval Air Station, Oceana, Va., \$3,962,000.

The air station is a master jet station, the home port for all Atlantic Fleet medium attack and fighter squadrons, and the Atlantic Fleet introduction site for the F-14 weapons system.

It supports three carrier air wings comprised of 11 fighter and 8 medium attack squadrons that deploy in rotation on Atlantic Fleet carriers.

The aircraft systems training building project will provide a maintenance training facility and an addition to the flight training buildings. These training buildings will house equipment to be utilized in training pilots and ground crew maintenance/personnel on the systems of the F-14 aircraft to be assigned to the station early in 1974.

The utilities project will expand the existing systems to service major facilities currently funded or planned for early funding. The existing system is currently fully utilized and fire protection is inadequate.

Status of funds:

Cumulative appropriations through fiscal year 1973.....	\$82, 272, 000
Cumulative obligations, Dec. 31, 1972 (actual).....	75, 164, 050
Cumulative obligations, June 30, 1973 (estimated).....	75, 474, 734

#### DESIGN INFORMATION

Project	Design cost	Percent complete, Apr. 1, 1973
Aircraft systems training buildings.....	\$5, 000	12
Utilities.....	31, 555	18

#### BASING OF JET AIRCRAFT

Mr. PATTEN. Where is the Navy planning to base jet aircraft on the east and west coasts?

Mr. MURPHY. Our airfield will be Oceana for medium attack and fighter aircraft. Cecil Field, Fla., for the light attack squadrons. Cecil will also upon realinement now be the homeport of the Atlantic Fleet fixed wing antisubmarine warfare carrier forces. On the west coast, North Island, Naval Air Station, the Naval Air Station at Lemoore, Calif., and the Naval Air Station at Miramar, Calif., also support jet fighter aircraft.

Also on the west coast, Naval Air Station on Whidbey Island in the State of Washington will support A-6 jets.

#### BASING OF ANTISUBMARINE WARFARE AIRCRAFT

Mr. PATTEN. Where are your ASW aircraft stationed on each coast?

Mr. MURPHY. Cecil Field will be the new base for the carrier ASW fixed wing aircraft, the S-3's. Similar forces on the west coast will be at North Island.

Land-based ASW, we have on the east coast at NAS Brunswick, Maine, and Jacksonville, Fla.

On the west coast NAS Moffett Field and also out at Pearl Harbor for P-3 ASW squadrons. That sums up the ASW.

#### BASING OF AIRCRAFT AND CARRIERS

Mr. PATTEN. It would appear that for reasons of economy, you are planning to home port similar carrier aircraft at single locations on the east and west coasts. How does this work from an operational standpoint when you deploy a CV carrier, for instance? Do you

planes fly to the carrier, or does the carrier steam to where the planes are based?

Mr. MURPHY. We use both methods. All our carriers are homeported near airfields that have a capability for bringing the aircraft to the pier side and lifting them aboard. If the deploying carrier elects that method of loading out the air wing, it can be done. Also it can be done in combination. The carrier can steam out of port and receive its air wing or a portion aboard by flying them in. But all of our airfields on the east coast, Norfolk and Mayport, carrier ports, similarly Alameda and North Island on the west coast, have the capability to hoist the aircraft aboard at pier side, or to receive them at sea.

Mr. PATTEN. Is there a usual way of doing it?

Mr. MURPHY. I would say about 50-50, Mr. Chairman, depending on the urgency or the time that is available.

#### ADVANTAGES OF SINGLE BASING

Mr. NICHOLAS. Is the number of aircraft you have aboard classified? In other words, which squadrons you would have?

Mr. MURPHY. The fact that the CV concept places in one ship both the attack and the ASW role, and you are squeezing in the aircraft during deployment, that is unclassified. In order for the ship to operate, or to swing from attack to ASW, it is necessary for the carrier to launch to a shore base some 15 to 20 of its aircraft in order to operate.

Those aircraft become the shore-based portion of the ship's wing.

Mr. PATTEN. Would you say if the carrier was 400 miles off the coast that would be feasible?

Mr. MURPHY. She could launch the portion of her air wing not needed aboard to a shore base from that distance with no problem.

With regard to the advantages of single basing the ASW jets and the attack jets, such as we are going to accomplish at Cecil Field, there are definite advantages to collocating them and preparing them jointly for their deployment.

#### COMPARISON OF CARRIERS AND AIRCRAFT NUMBERS

Mr. PATTEN. What allowance do you make for the time that a carrier must spend in regular overhaul?

Mr. MURPHY. Mr. Chairman, we provide a wing of aircraft for each carrier. When one of the carriers in our total is in an overhaul period, the air wing associated with that ship is undergoing training, replenishment and generally you may be in a stand-down position after a long deployment. The air wing associated with the ship in overhaul has functions that continue and, on the assumption we could have one less air wing or two less, we feel we would be backing into a situation where the air people would be subject to more stringent deployment timetables and would be subjected to hardships in that they would have to continue deployments at a faster rate than the ship.

Mr. McEWEN. You have a carrier in for overhaul all the time, don't you?

Mr. MURPHY. Yes, sir. Of the 12 in our projected force level, each one at 4-year intervals approximately must enter a 10-month overhaul period.

Mr. McEWEN. Actually to operate you wouldn't have to have a wing for every carrier except for rotation of the crews; is that right?

Mr. MURPHY. Yes, sir.

Mr. PATTEN. Are there fewer carrier deck-fulls of aircraft at the present time than there are carrier decks?

Mr. MURPHY. At the present time we are slightly deficient. We have provided, Mr. Chairman, a classified summary for the staff on this subject showing our present aircraft squadron count and how we propose to go down to a 12-carrier level.

In general at the present time carrier numbers are still up. We will at the present time have a slight excess.

Mr. PATTEN. Is the same true of your future plans—excluding for a moment the CV concept which would require ASW or fighter aircraft on a standby basis.

Mr. MURPHY. We are taking our squadron count down to match the 12 decks that will be the Navy's carrier force level.

Mr. NICHOLAS. Another factor is how the Marines are used on the carriers.

Mr. MURPHY. The Marines operate from the carriers. However, they have a shore-based mission with the F-14 very similar to the sea-based activity.

Mr. NICHOLAS. Any critical shortage which you had in Navy operational squadrons to be deployed in Navy operations could be made up by the Marine Corps squadrons?

Admiral MARSCHALL. If the Marine Corps squadrons are available. They have missions other than flying from carriers. As a matter of fact, that has traditionally been a secondary role for them. I think it was well toward the end of World War II before we ever had Marines flying off a carrier and it hasn't happened too often since World War II.

Mr. PATTEN. With the new ecumenical spirit, it is more common today. The marines seem to always be there. I thought there was a greater mix and that it was done deliberately.

Admiral MARSCHALL. It is done deliberately to keep people trained, but so far as deploying actual operational squadrons of marines aboard Navy carriers, that has been more the exception than the rule. Primarily because they have other missions which they must accomplish. For example, in Vietnam we had the marines ashore and the naval carriers at sea.

#### AIRBASE REDUCTIONS

Mr. PATTEN. In earlier testimony it was stated that upon completion of the realignment actions the Navy will have reduced its active aircraft basing complexes by 30 percent. Could you indicate where this 30-percent reduction has occurred?

Admiral MARSCHALL. I think we will have to give you that for the record, Mr. Chairman.

Mr. PATTEN. All right.

[Note: The Navy was unable to provide a satisfactory response.]

Mr. PATTEN. Is there a possibility there may still be further reductions in your aircraft basing structure?

Mr. MURPHY. At the moment, with the realignment announcement on the 17th of April, it is very doubtful we would have a further reduction.

Mr. PATTEN. Will all of your active airfields be loaded to capacity in, say, 1978?

Mr. MURPHY. I would say yes, and then consider stations such as Alameda where we have purposely unloaded many fleet units, retaining the airfield, however, to support predominantly NARF and Reserve functions; a station in that category you would have to consider lightly loaded with a possible mobilization aspect. However, our hard core active bases such as I mentioned earlier will all have a heavy loading and aircraft.

Mr. PATTEN. How about, for the record, if you compare the number of aircraft or squadrons in these airfields in 1970, 1974, and 1978?

Mr. MURPHY. Yes, sir.

[The information follows:]

AIRCRAFT LOADS

	1970	1974 <sup>1</sup>	1978 <sup>1</sup>
<b>NAS, Brunswick, Maine:</b>			
Patrol:			
P-2 squadron.....	1	-0-	-0-
P-2 aircraft.....	3	-0-	-0-
P-3 squadron.....	3		
P-3 aircraft.....	27		
<b>Total Brunswick:</b>			
Squadron.....	4		
Aircraft.....	30		
		[Deleted]	
<b>Principal west coast air station and loadings:</b>			
<b>NAS, North Island, Calif :</b>			
S-3 squadron.....	0		
S-3 aircraft.....	0		
<b>Total, North Island, Calif :</b>			
Squadron.....	0		
Aircraft.....	0		
<b>NAS, Miramar, Calif.:</b>			
F-4 squadron.....	10		
F-4 aircraft.....	149		
F-8 squadron.....	8		
F-8 aircraft.....	109		
F-14 squadron.....	0		
F-14 aircraft.....	0		
<b>Total, Miramar:</b>			
Squadron.....	18		
Aircraft.....	258		
		[Deleted]	
<b>NAS, Lemoore, Calif.:</b>			
A-4 squadron.....	8		
A-4 aircraft.....	103		
A-7 squadron.....	12		
A-7 aircraft.....	154		
<b>Total, Lemoore:</b>			
Squadron.....	20		
Aircraft.....	257		
<b>Principal East Coast air stations and loadings:</b>			
<b>NAS, Oceana, Va.:</b>			
Attack:			
A-6 squadron.....	6		
A-6 aircraft.....	87		
Fighter:			
F-4 squadron.....	10		
F-4 aircraft.....	120		
F-14 squadron.....	0		
F-14 aircraft.....	0		
<b>Total, Oceana:</b>			
Squadrons.....	16		
Aircraft.....	207		
		[Deleted]	

## AIRCRAFT LOADS—Continued

	1970	1974 <sup>1</sup>	1978 <sup>1</sup>
NAS, Cecil Field, Fla.:			
Attack:			
A-4 squadron.....	6	0	0
A-4 aircraft.....	84	0	0
A-7 squadron.....	8		
A-7 aircraft.....	96		
Carrier ASW:			
S-3 squadron.....	0		
S-3 aircraft.....	0		
Total, Cecil Field:			
Squadrons.....	14		
Aircraft.....	180		
NAS, Jacksonville, Fla.:			
P-3 squadron.....	3		
P-3 aircraft.....	28		
Total, Jacksonville:			
Squadron.....	3		
Aircraft.....	27		
P-3 squadron.....	7		
P-3 aircraft.....	63		
Total, Moffett Field:			
Squadron.....	7		
Aircraft.....	63		
NAS, Whidby Island, Wash.:			
Attack:			
A-6 squadron.....	5		
A-6 aircraft.....	75		
A-3 squadron.....	1	0	0
A-3 aircraft.....	21	0	0
ECM:			
EA-6B squadron.....	0		
EA-6B aircraft.....	0		
Patrol:			
P-3 squadron.....	1	0	0
P-3 aircraft.....	9	0	0
Total, Whidby Island:			
Squadron.....	7		
Aircraft.....	105		
NAS, Barbers Point, Hawaii:			
P-3 squadron.....	4		
P-3 aircraft.....	42		
Total, Barbers Point:			
Squadron.....	4		
Aircraft.....	42		

<sup>1</sup> Classified strengths for 1974 and 1978 have been deleted.

Note: The above figures reflect only the deployable fleet operational squadrons, and thus exclude training, utility, speciality and reserve squadrons. The 1978 figures are slightly lower than the 1974 figures due to overseas homeporting of selected carrier squadrons.

## F-14 AIRCRAFT

Mr. PATTEN. It has been stated that the total F-14 buy is to be some 313 aircraft. Originally I believe the Navy intended to have at least that many aircraft to supply the necessary aircraft fighter squadrons for its carrier decks. Now it appears that there may be a lesser number of F-14's procured or that the Marine Corps may have the privilege of buying some of these 313 F-14's. Is that correct?

Mr. MURPHY. Mr. Chairman, through fiscal year 1973 the Navy will have procured 134 F-14's. Our target figure of 313 is the level at which we can achieve six squadrons in each fleet. Twelve F-14 squadrons.

It is our plan, and the CNO has stated the Navy plans an orderly continuation of the buy above the 134 level. To that end in 1974 the

Department of Defense appropriations requests funds for another 48 aircraft.

Mr. NICHOLAS. Do the 313 comprise three squadrons in each fleet?

Mr. MURPHY. As we have less than 313, we have less than 12 squadrons.

MARINES USE OF F-14'S

Mr. PATTEN. Are you going to let the marines have a few of them?

Mr. MURPHY. The Marines have indicated an interest in buying F-14 aircraft and in having four squadrons, two on the east coast, two on the west coast, to in effect complement the Navy's F-14 squadrons.

Their buy of 84 aircraft total, I believe, this hasn't been firmed up.

Mr. NICHOLAS. Wasn't it the Secretary of Defense's decision their aircraft would come out of the 313?

Mr. MURPHY. I don't know the answer to that.

Mr. PATTEN. The Admiral does not think so?

Admiral MARSCHALL. I don't know, sir.

Mr. MURPHY. I would like to say this: The Navy's 134 level we are now at is proposed by the Navy to be, in an orderly manner, increased to a level that we can have six squadrons in each fleet, which is the target.

Mr. PATTEN. Where are the Marines going to put their Air Force?

Mr. MURPHY. Two squadrons at Beaufort and two squadrons at Yuma. They would be deploying those squadrons between 1975 and 1978.

Mr. McEWEN. If you don't let the Marines fly off your carriers very often, why are you supplying them with F-14's? Is that the best fighter for them or the best carrier fighter?

Admiral MARSCHALL. Mr. McEwen, I don't know the answer to your question because I am not much of an aviator. I fly as a passenger only. I think the reason Marines do not fly off of carrier decks more often is purely and simply because of their own requirements. It is not a question of letting them fly, as much as each service taking care of its own responsibilities at any particular time.

I know we have gone to the Marine Corps, the Navy has, and asked their help in providing squadrons for carrier decks, and they have complied in the past. They are truly integrated within the Navy.

Mr. McEWEN. Is the F-14 considered the best aircraft for their primary mission?

Admiral MARSCHALL. Sir. I don't know. Again, the Commandant of the Marine Corps has chosen to buy them and I presume for his purposes that it is a fine aircraft.

I have read that the decision has been made and announced by the Secretary of Defense.

Mr. McKAY. If your statement is correct and if they are truly integrated and using the same aircraft why do you need to buy some for the Navy and some for the Marines? Do we still have the old sovereignty situation working here?

Mr. MURPHY. We require the forces of squadrons in being, Navy squadrons, which we associate with certain carrier forces. The Marines have a requirement for the Marine aviation that complements their ground mission. This mission for the F-14 is predominantly intercept-

tion, similar to the carrier except predominantly from a land situation. It is a completely separate mission requirement of each service.

Admiral MARSCHALL. Yes, sir. there has constantly been one.

Mr. PATTEN. Which would bolster what was just said, that if they have ground forces, they can operate from land.

Are there any further questions?

#### F-14 TRAINING FACILITIES

What is your program for providing training facilities for the F-14?

Mr. MURPHY. Mr. Chairman, our program has been progressing since fiscal year 1972-71. Correction. At that time we provided our first training facility at Miramar for essentially training both the ground personnel that will maintain the airplane, as well as the flight crews, and that is our initial training capability coming into operation at the present time.

We have progressed now to this year's program where we are seeking, in addition to another flight crew trainer at Miramar, we are now proposing a maintenance training facility at Oceana. This is entirely similar to the maintenance trainer that was approved in 1971 for Miramar. We feel it is a logical step to now have this capability for the Atlantic Fleet squadrons that will be based at Oceana.

We have been procuring for this Oceana installation—we have a procurement program in being of approximately \$23 million for the training devices that will be installed in this building. That procurement is proceeding.

Several of the training devices are being built at the moment, all expected to be on hand at the time we complete the Oceana project.

At the completion of the Oceana project, we will then have a full capability at both Miramar and Oceana for F-14 training, both ground personnel and the crews.

Mr. PATTEN. For both operational and maintenance training?

Mr. MURPHY. Yes, sir.

Mr. PATTEN. Originally you were going to conduct the operational training at both places, but to concentrate maintenance training at NAS, Miramar. Why isn't this still a good plan until you find out what your force levels will be?

Mr. MURPHY. If our forces remain low, that will be the course, but the Navy's plan is to proceed with orderly procurement much beyond the 134, permitting the six squadrons on the east coast to come into being and indeed the first two squadrons will be coming into being at Oceana in July 1974.

#### F-14 PROCUREMENT AND BASING

Mr. NICHOLAS. There seems to be some confusion as to what the total buy will be. The Marine Corps is supposed to get 84 of these aircraft and the Navy says they need 313 in addition, but then there may be a decision that there will be only 313 in total. There could be a substantial 25-percent difference in your training workload.

Mr. MURPHY. We propose to go with an orderly buy aiming for the 313 Navy only.

[The information follows:]

## SUMMARY OF F-14 PROGRAM

		Cumulative	
<b>I. Aircraft procurement:</b>			
Fiscal year:			
1969	-----	6	6
1970	-----	6	12
1971	-----	26	38
1972	-----	48	86
1973	-----	48	134
1974	-----	50	1 184
1975	-----	50	2 234
1976	-----	50	2 284
1977	-----	50	2 334
<b>Total program</b>	-----	<b>334</b>	-----

<sup>1</sup> Budget submission.

<sup>2</sup> Proposed.

It is the Navy's intent to pursue the above orderly procurement schedule. The Marine Corps would receive some 60 aircraft out of the buy. SECDEF has approved this plan. SECDEF has directed that the Navy study and develop, for procurement commencing in fiscal year 1978, a low-cost alternative aircraft.

## II. FORCE STRUCTURE

Fiscal year:	Total number of F-14 squadrons					
	USMC					
	Oceana (tactical)	Miramar		Beaufort (tactical)	Yuma	
Tactical		Training	Tactical		Training	
1973	-----					
1974	-----					
1975	-----	[Deleted]	[Deleted]	[Deleted]	[Deleted]	[Deleted]
1976	-----	[Deleted]	[Deleted]	[Deleted]	[Deleted]	[Deleted]
1977	-----	[Deleted]	[Deleted]	[Deleted]	[Deleted]	[Deleted]
1978	-----					
1979	-----					

## III. TRAINING PROGRAM

**MIRAMAR:** The fiscal year 1971 MCON training building at Miramar was occupied in September 1972 and is serving training needs of maintenance personnel and flight crews for the initial squadrons. Both Navy and Marine Corps maintenance personnel for west coast squadrons will train here over the long term. Additional flight trainers will be installed when the fiscal year 1973 MCON project, now under construction, is completed in 1974. Over the long term, all introductory training for Navy flight crews entering the F-14 program will be conducted here. Marine Corps flight crews will ultimately be introduced to F-14's in a Yuma-based training squadron, however.

**OCEANA:** The fiscal year 1973 MCON project, now under construction, will provide refresher flight training for flight crews of squadrons assigned to Oceana. The proposed fiscal year 1974 MCON project will provide primarily introductory and refresher training for F-14 maintenance personnel in or going to east coast F-14 squadrons, both Navy and Marine Corps. Training equipment valued at \$15 million is in production for the fiscal year 1974 Oceana facility, with \$7.5 million additional in fiscal year 1974 PAMN budget. Capacity to train personnel for all F-14 squadrons does not exist at Miramar. Economic analysis shows that training on both coasts is optimum from a cost-to-train standpoint.

## NEED FOR TWO FACILITIES

Mr. NICHOLAS. At what point does it become more economical to set up two maintenance training facilities—

Admiral MARSCHALL. The two became economical for sure when the Marines decided to buy the F-14 because they too will train at our

facilities at both Oceana and Miramar. So when you consider the requirement for these facilities, you consider not only Navy aircraft, but also Marine aircraft. They will use the facilities jointly.

Mr. NICHOLAS. Could you provide something for the record as to the level?

Admiral MARSCHALL. We think right now it will be more economical to do it on both coasts. We will provide figures for the record.

[The information follows:]

The original Navy concept for F-14 maintenance training was to provide this training at NAS Miramar for both Atlantic and Pacific Fleet personnel. As the number of F-14 aircraft to be purchased became more firm, and peripheral factors (availability of BEQ spaces, availability of devices for refresher training at NAS Miramar, per diem rates, morale effects of separation from family, et cetera) were considered, it became apparent that the maintenance training should also be provided at NAS Oceana.

The F-14 maintenance training is divided into 16 F-14 peculiar courses ranging from an 8-week familiarization course to a 26-week weapons system specialist course, with an average length of 13 weeks. It is Navy policy to not pay permanent change of station relocation costs more often than once per fiscal year. Consequently Atlantic Fleet student personnel would have to be detailed to NAS Miramar as temporary duty and paid an appropriate per diem allowance. With the shortage of BEQ spaces at NAS Miramar, the \$25/day per diem rate (no Government quarters or mess available) would have to be paid. Round trip transportation is estimated to be \$330. These per diem and travel costs total \$2,600 per student, based on the 13-week course length. With an estimated annual student load of 460 personnel, these costs total \$1,200,000 annually.

The establishment of a maintenance training capability at NAS Oceana permitted the reduction of NAS Miramar fiscal year 1973 MCON project P-159 from 39,161 square feet and \$1,710,000 to 5,161 square feet and \$306,000. All of the maintenance training equipment originally planned for the NAS Miramar project P-159 has been rescheduled for delivery to NAS Oceana.

An economic analysis indicates a present value cost differential of approximately \$7 million in favor of the NAS Oceana maintenance training facility. By taking into account that the \$1,200,000 annual savings will not start to accrue until 3 years after the initial investment, and effective payback period of 6 years can be realized.

#### AIRCRAFT TRAINING BUILDINGS

Mr. PATTEN. You are requesting \$3,386,000 for an aircraft systems training buildings at NAS, Oceana. What type of training will this provide?

Mr. MURPHY. This provides both the maintenance training of the ground support personnel and also provides a flight trainer for the two-man flight crew to receive training on the ground.

Mr. PATTEN. Provide for the record the status of equipment procurement related to this project.

[The information follows:]

Procurement of the \$23 million in equipment to be installed in this training building is proceeding as follows:

Item	Status	Cost (thousands)
1. F-14 naval aviation maintenance trainer (NAMT)...	Included in fiscal year 1972, Grumman buy. 75 percent built in May 1973. Delivery by end calendar year 1974.	\$9,050
2. F-14 operational flight trainer, F-14 mission trainer.	Included in fiscal year 1974 PAMN budget before Congress.	7,500
3. AWG-9 missile trainer engine and miscellaneous trainer.	Included in fiscal year 1972 and fiscal year 1973 PAMN budget.	6,100

Mr. PATTEN. Is the utilities project required in support of the aircraft systems training building?

Mr. MURPHY. The utilities project partially supports the aircraft systems training building by providing a new sanitary sewer system and sewage lift station to which the training building will be connected.

NORFOLK NAVAL SHIPYARD, PORTSMOUTH, VA.

Mr. PATTEN. Insert page I-81 in the record.

[Page I-81 follows:]

1. DATE 17 APR 1973		2. DEPARTMENT NAVY		3. INSTALLATION NORFOLK NAVAL SHIPYARD					
4. COMMAND OR MANAGEMENT BUREAU NAVAL SHIP SYSTEMS COMMAND			5. INSTALLATION CONTROL NUMBER 5867-651		6. STATE/COUNTRY PORTSMOUTH, VIRGINIA				
7. STATUS ACTIVE		8. YEAR OF INITIAL OCCUPANCY 1801		9. COUNTY (U.S.) INDEPENDENT CITY	10. NEAREST CITY WITHIN CITY				
11. MISSION OR MAJOR FUNCTIONS This Shipyard provides logistic support for assigned ships including conversion, overhaul, repair, alterations and drydocking of surface ships and modern submarines; support for weapons systems air and anti-air warfare, anti-submarine and attack submarine warfare; support for approximately 100 ships homeported in the area. Major Activities Supported: Naval School - Crypto Repair Naval Ordnance Systems Support Office, Atlantic Major Functions: Maintenance and overhaul of surface ships (up to and including attack carriers) and modern attack submarines									
12. PERSONNEL STRENGTH		PERMANENT		STUDENTS		SUPPORTED		TOTAL	
		OFFICER (1)	ENLISTED (2)	CIVILIAN (3)	OFFICER (4)	ENLISTED (5)	OFFICER (6)	ENLISTED (7)	CIVILIAN (8)
a. AS OF 31 December 1972		70	67	9,522	0	136	610	7,095	1,101
b. PLANNED (End FY 1975)		84	111	9,832	0	135	500	6,150	1,100
13. INVENTORY									
LAND		ACRES (1)		LAND COST (\$000) (2)		IMPROVEMENT (\$000) (3)		TOTAL (\$000) (4)	
a. OWNED		784		1,349		149,608		150,957	
b. LEASES AND EASEMENTS#		4* - 11#		0* - 18#		0		18	
c. INVENTORY TOTAL (Except land rent) AS OF 30 JUNE 19 72								150,975	
d. AUTHORIZATION NOT YET IN INVENTORY								26,095	
e. AUTHORIZATION REQUESTED IN THIS PROGRAM								17,868 1/	
f. ESTIMATED AUTHORIZATION - NEXT 4 YEARS								25,229	
g. GRAND TOTAL (c + d + e + f)								200,167	
14. SUMMARY OF INSTALLATION PROJECTS									
PROJECT DESIGNATION									
CATEGORY CODE NO. a	PROJECT TITLE b			TENANT COMMAND PRIORITY c	UNITY OF MEASURE d	AUTHORIZATION PROGRAM e		FUNDING PROGRAM f	
						SCOPE g	ESTIMATED COST (\$000) h	SCOPE i	ESTIMATED COST (\$000) j
213.49	MACHINE SHOP			48	LS	-	4,066	-	4,066
722.10	BACHELOR ENLISTED QUARTERS			61	SF	81,012	2,624	81,012	2,624
723.10	ENLISTED MEN'S DINING FACILITY			60	SF	13,696	1,111	13,696	1,111
812.30	UTILITIES IMPROVEMENTS (5TH INCR)			43	LS	-	3,332	-	3,332
						TOTAL	11,133		11,133
1/ INCLUDES \$6,735,000 FOR POLLUTION ABATEMENT									

DD FORM 1390  
1 OCT 72

The shipyard performs conversions, overhaul, repair, alteration, and outfitting on nuclear and conventional surface ships and modern attack submarines, including air and antiair warfare systems, antisubmarine and submarine warfare systems.

The machine shop project will alter and install an addition to the inside machine shop to provide consolidated efficient work spaces for the overhaul and repair functions performed in the mechanical shops.

The bachelor enlisted quarters will provide 516 men with modern living spaces that meet current habitability standards.

The enlisted men's dining facility project will provide a new consolidated messing facility and replace existing temporary World War II deteriorated facilities.

The utilities improvements project (fifth increment) will upgrade existing utilities systems to provide the capacity needed for effective overhaul and repair of ships.

Status of funds:

Cumulative appropriations through fiscal year 1973	\$53, 274, 000
Cumulative obligations, Dec. 31, 1972 (actual)	40, 266, 393
Cumulative obligations, June 30, 1973 (estimated)	46, 301, 935

DESIGN INFORMATION

Project	Design cost	Percent complete, Apr. 1, 1973
Machine shop	\$110, 000	9
Bachelor enlisted quarters	80, 160	13
Enlisted men's dining facility	55, 927	31
Utilities improvements	148, 655	50

*Current bachelor enlisted status at NS, Norfolk, Va.*

1. Effective BEQ requirement	2, 273
2. Adequate assets	358
Installation	332
Community	26
3. Deficit	1, 915
4. Fiscal year 1974 project	516
5. Remaining deficit after fiscal year 1974	1, 399

EFFECT OF REALINEMENTS

Mr. PATTEN. What effect will the realinements have upon the workload scheduled for Norfolk Naval Shipyard?

Captain GINN. The realinement, in the immediate future, will raise the amount of overhaul and repair requirements at the Norfolk Naval shipyards. In the long-range there will be a general increase in the outyears.

Mr. PATTEN. Do you know how much of an increase? You said there is going to be an increase in the workload.

Captain GINN. There will be probably about 1,000 to 1,500 man-years worth of work in the immediate future and it appears somewhere in the 1,500 to 2,000 range in the outyears. That is the increase.

Mr. PATTEN. Will there be no project required here as a result of the realinement?

Captain GINN. No, sir; there will not be.

FUTURE CONSTRUCTION PROGRAM

Mr. PATTEN. Provide for the record the estimated authorization for the next 4 years totaling \$25,229,000.

Admiral MARSCHALL. We will provide that.  
[The information follows:]

## TENTATIVE PROGRAM FOR NEXT 4 YEARS AT NSY, NORFOLK

Fiscal years	Project description	Cost (thousands)
1975.....	Drydock No. 4 modernization (1st increment).....	\$4, 399
	Rehabilitate marine barracks M-32.....	982
	Fiscal year 1975 total.....	5, 381
1976-78.....	Utility improvements (6th increment).....	4, 616
	Waterfront improvement (1st increment).....	1, 336
	Rehabilitate marine barracks M-22.....	927
	BOQ Rehabilitation.....	705
	Warehouse.....	2, 250
	Waterfront improvement (2d increment).....	3, 633
	EWP facility addition (1st increment).....	6, 381
	Fiscal year 1976-78 total.....	19, 848
	Grand total.....	25, 229

## WORKLOAD

Mr. PATTEN. Would the number of man-years at this yard, if it were utilized at total capacity on a one-shift, 40-hour-week basis, be about 18,000?

Captain GINN. No, sir. For Norfolk, the one-shift basis is nearer 12,000.

Mr. PATTEN. What are you actually planning for fiscal year 1974 and in the out years?

Captain GINN. Mr. Chairman, the end of the year on board count in Norfolk for fiscal year 1973 is 8,788. The average man-years of work for fiscal year 1974 is around 10,475 and the average for fiscal year 1975 will be 11,300.

## NUCLEAR SHIP WORKLOAD IN NORFOLK AREA

Mr. PATTEN. This is a nuclear capable repair yard, as is the private yard at Newport News. What numbers of nuclear submarine or other nuclear ship overhauls are you planning at each of these yards in fiscal years 1974-76? Provide details for the record.

[The information follows:]

## NUCLEAR SHIP OVERHAULS PLANNED

The currently planned nuclear ship overhauls at the Norfolk Naval Shipyard and Newport News Shipbuilding & Drydock Co. in fiscal years 1974 through 1976 are:

Shipyard	Fiscal year—		
	1974	1975	1976
Norfolk.....	1-SSN OVHL.....	1-SSN OVHL.....	2-SSN OVHL.
Newport News.....	1-SSBN CONV.....	1-SSBN CONV.....	1-SSN SRA.
		1-SSN OVHL.....	1-SSN OVHL.
			1-SSBN OVHL.

## Ship types :

- SSN—Nuclear attack submarine.
- SSBN—Fleet ballistic missile submarine.

## Availability types :

- CONV—Poseidon conversion including ship overhaul.
- OVHL—Overhaul.
- SRA—Selected restricted availability.

It should be understood that fleet operational needs, fiscal restraints, and overall shipyard workload considerations dictate a continuing review of ship overhaul assignments. Thus, currently planned assignments may change.

Mr. PATTEN. What level of nuclear submarine or other ship overhauls would represent the most efficient use of the nuclear-trained personnel and the facilities for each of these yards? Provide additional information for the record.

[The information follows:]

A level of nuclear ship overhauls which would most efficiently use nuclear-trained personnel and facilities depends on a number of factors. One factor is the amount and type of other work in the yard since nuclear-trained personnel and facilities for the most part can be used on other ship work in intervals when nuclear overhaul work is low. Presently, at Norfolk Naval Shipyard, the level of nuclear ship overhauls which would provide an efficient use of nuclear-trained personnel and facilities is two to three nuclear attack submarine (SSN) regular overhauls per year, with start dates spaced from 4 to 6 months apart.

The Navy currently has only one SSN overhaul per year assigned to Norfolk for the next 2 years, but the Navy is attempting to improve this situation by reassigning additional SSN repair work to Norfolk from other yards which have short-term overload situations.

With regard to Newport News, the yard's workload on other types of ship work, including nuclear ship construction, is such that two to three nuclear submarines (SSN or SSBN) overhauls a year is an efficient level. Only one SSBN overhaul is scheduled to start at Newport News in fiscal year 1974 for a number of reasons—principally, a lower total level of planned nuclear ship overhauls this year in the Atlantic. Two nuclear submarine overhauls per year are planned in the subsequent 2 years for which approved schedules are available.

## MACHINE SHOP

Mr. PATTEN. You are requesting a machine shop at a cost of \$4,066,000. Provide the committee with a copy of the industrial engineering study completed in November 1972, which determined the space required for this function.

Captain GINN. I will be glad to.

[NOTE: The study was voluminous and therefore was supplied directly to the staff of the committee for study.]

Mr. PATTEN. Upon what total workload in the shipyard and what workload in the machine shop was this study based?

Captain GINN. The total shipyard workload used for the study was around 12,000. I will have to extract from the total and provide for the record the man-years of work in the machine shop since this project also covers the central tool shop and the diesel repair shops.

Mr. PATTEN. Speaking of the workload, is it about the same as that which you are currently projecting?

Captain GINN. Yes, sir; the data we gave the contractor to work from was the total shipyard planning figure of around 12,000.

Mr. PATTEN. Perhaps you can provide some details for the record.

Captain GINN. Yes, sir.

[The information follows:]

## MACHINE SHOP MANPOWER LEVELS

The industrial engineering study for the machine shop at Norfolk was based on the following recommended manning levels:

Central tool shop personnel.....	187
Machine shop personnel.....	795
Additional support personnel.....	118

Total personnel..... 1, 100

This compares with current estimates for this facility as follows:

Central tool shop personnel.....	187
Machine shop personnel.....	795
Additional support personnel.....	118

Total personnel..... 1, 100

Captain GINN. You will remember from discussions that we previously had, when we do an industrial engineering study for a project we use the middle 6 years of a 10-year workload forecast. We do not use the first 2 years because we can't program anything fast enough to affect that portion of the workload.

Mr. PATTEN. Speaking of your standardization, streamlining, and everything else, machine shop tools are undergoing great changes.

Captain GINN. Yes, sir.

Mr. PATTEN. I suppose all the new technology will be incorporated in this project?

Captain GINN. This is the prime driving force behind this project. This is the first project for the Norfolk Naval Shipyard based entirely upon economics. Workload is not driving it. Immediate need is not driving it. It is to cut the cost of the unit of production.

Mr. PATTEN. Describe what you propose to do in the machine shop project, and tell us why an addition to the facility is required.

Captain GINN. The machine shop is a very large complex consisting, essentially, of three major sections. The first section has a mezzanine and intermediate floor in it.

The second section is a high bay with no intermediate floors. The third section is low bay and has three floors. The first and second sections were built in 1918 and section three was built in 1941 to increase the shop capacity for World War II. We have exceeded floorload in some instances and we are having to move some of the heavy machinery from the upper floors to relieve the floorload. As speed and feed of machine tools have increased due to increased technology, the weight of the equipment has also increased. Part and parcel of this project is a replacement of a large percentage of the production equipment in the shop. By taking as many of the productive units as possible that are on the upper floors, and bringing them down to the first floor we will be converting to get a single-floor operation in the machine shops. The movement of heavy components by elevators and vertical lifts is not a good way to run a machine shop. When we move the heavy work from the upper floors to the lower floors we are then short about 58,000 square feet of space.

Mr. PATTEN. Including the mezzanine?

Captain GINN. There will be about 100,000 square feet of space on mezzanines and upper floors that we will not be using for machine shop purposes, and 79,000 square feet on the upper floors will continue to be used for small gear production, turbine blade manufactur-

ing, injector repair, engraving, locker rooms, training rooms and shop offices.

ECONOMIC ANALYSIS OF MACHINE SHOP

Mr. PATTEN. The committee has been provided with an economic analysis of this project dated May 25, 1973. Please provide a copy of this for the record.

[The information follows:]

The economic analysis for this project has recently been revised as a result of a detailed industrial engineering study. This analysis was prepared by the engineering firm who performed the study. It can be seen that the savings/investment ratio of 2.42 will result in a payback period of 5 years.

ECONOMIC ANALYSIS, DEPARTMENT OF THE NAVY INVESTMENTS,  
SUMMARY OF PROJECT COSTS, FORMAT A-1

1. Submitting Department of the Navy component: Norfolk Naval Shipyard.
2. Date of submission: May 1973.
3. Project title: Machine shop.
4. Description of project objective: Provide a new addition to building 171 consisting of 48,500 square feet of single-story production area, 4,000 square feet of two-story building for toolroom and shop stores, and 1,080 square feet of lean-to for bar storage. Rearrange inside machine shop's machine tools into an efficient process layout. Relocate the central tool shop to improve facilities. Provide new equipment to replace outdated equipment for both the inside machine and central tool shops. Modernize electrical power and lighting systems within building 171 and refurbish and/or modernize toilet facilities, office areas, and air-conditioning systems.
5. Alternative: (a) Proposed project; (b) utilize existing facilities.
6. Economic life: Facilities, 25 years. Utilities, 15 years. Equipment, 10 years.

FORMAT A-1 (4% Inflation/Year)

7. Project Year	8. Recurring (Operations) Cost		9. Differential Cost	10. Discount Factor	11. Discounted Differential Cost
	a. Present	b. Proposed			
	<u>Alternate</u>	<u>Alternate</u>			
1	\$ 17,527	\$ 17,527	0	.954	0
2	18,228	18,228	0	.867	0
3	18,964	16,613	2351	.788	1853
4	19,718	17,181	2537	.717	1819
5	20,507	17,872	2635	.652	1718
6	21,330	18,594	2736	.592	1620
7	22,172	19,332	2840	.538	1530
8	23,066	20,117	2949	.489	1442
9	23,994	20,931	3063	.445	1363
10	24,941	21,762	3179	.405	1287
11	25,940	22,639	3301	.368	1215
12	26,974	24,486	2488	.334	831
13	28,061	25,755	2306	.304	701
14	29,182	26,930	2252	.276	622
15	30,357	28,016	2341	.251	588
16	31,566	30,334	1232	.228	281
17	32,828	31,547	1281	.208	266
18	34,143	32,810	1333	.189	252
19	35,510	34,124	1386	.172	238
20	36,929	35,488	1441	.156	225
21	38,402	36,903	1449	.142	213
22	39,944	38,385	1559	.129	201
23	41,539	39,918	1621	.117	190
24	43,204	41,518	1686	.107	180
25	44,922	43,169	1753	.097	170
26	46,719	44,896	1823	.088	160
27	48,588	46,692	1896	.079	150
12. TOTALS	825,255	771,767	53,488		19,115

NOTE: All Cost in Thousands

13.	<u>Present Value of New Investment:</u>	
	(a) Facilities	\$ 4,066,000
	(b) Equipment	5,876,500
	(c) Other - None	-----
	(d) Working Capital - No Change	-----
14.	<u>Total Present Value of New Investment:</u>	\$ 9,942,500
15.	<u>Less:</u> Present Value of Existing Assets Replaced	\$ 2,052,500
	(a) \$983,695 Salvage Value of Existing Machine Tools	
	(b) \$1,069,000 Terminal Value of New Machine Tools	
16.	<u>Plus:</u> Value of Existing Assets to be Employed on the Project	0
17.	<u>Net Investment:</u>	\$ 7,890,000
18.	<u>Present Value of Cost Savings from Operations.</u>	\$10,115,000
19.	<u>Plus:</u> Present Value of the Cost of Refurbishment or Modification Eliminated	0
20.	<u>Total Present Value of Cost Savings:</u>	\$19,115,000
21.	<u>Savings/Investment Ratio:</u>	2.42
22.	<u>Source/Derivation of Cost Estimates:</u> Professional industrial engineering study	

## INFLATION INCLUDED IN ECONOMIC ANALYSIS

Mr. PATTEN. Is it correct that this economic analysis is based upon an assumed 4-percent-a-year inflation factor?

Captain GINN. That is correct, sir.

Mr. PATTEN. Why was this assumed?

Captain GINN. Because that was the standard inflation factor that the Navy decided to use this year.

Mr. PATTEN. Last year, in commenting on a similar economic analysis prepared for a Navy shipyard, the committee's surveys and investigations staff indicated that the effect of such an inflation factor should be tested if an inflation factor was to be used at all. Provide us with an economic analysis which tests the effect of the assumed inflation factor on the savings claimed for this project.

Captain GINN. We have run a sensitivity analysis on this project, assuming there would be no 4 percent during its life and the result of that was to reduce the cost savings from \$19,115,000 to \$14,016,000 and to reduce the savings-investment ratio from 2.42 to 1.78. Now, even in the unlikely event there will be no further inflation in the next 25 years, the savings ratio of 1.78 is considered an extremely attractive proposition.

Mr. PATTEN. You know, Captain, I am an old Depression fellow. Some of us are a little worried about some signs we see.

Captain GINN. We say, even without any inflation, it is still an attractive proposition.

## DISCOUNT OF SAVINGS TO ALLOW FOR CONSTRUCTION PERIOD

Mr. PATTEN. In what year does the economic analysis which you have prepared assume that savings will start to be generated from this project?

Captain GINN. The year after completion of construction, sir.

Mr. PATTEN. In what year does it assume that the capital expenditures will be made? You say you figure it from the time the project is completed?

Captain GINN. Yes, sir. What I am really saying is, we don't take any benefit for payback until the project has been completed and we have occupied the building, regardless of what year it is.

The discount starts the year after we occupy. If it takes 2 years to build the building, it will be a 27-year discount table, and the last 25 years is what we claim.

Mr. NICHOLAS. According to the investigative staff's expert who did these studies last year, you should start discounting when you invest the money. It affects the amount of savings you claim all the way down the line. Would you like to take another look at this? This is one of the big factors they brought out in doing the study last year; the savings should be discounted, not starting when the savings occur, but when you make the capital expenditure.

Would you take another look at this and at your procedures? It is something the Air Force was doing the other way too. Now they have changed their technique.

Mr. PATTEN. Why hasn't the Navy taken steps to correct its methodology in these economic analyses?

[The information follows:]

## CORRECTIVE STEPS TAKEN

It is considered that steps have been taken to correct the methodology. It is recognized that construction time must be considered in economic analyses of investment proposals. The proper treatment of construction leadtime is specifically addressed in an economic analysis handbook, copies of which have been disseminated to field personnel who have responsibility for the actual preparation of economic analyses. Also, in the wake of the subcommittee's staff report of last year, an amplified coverage of leadtime has been incorporated into economic analysis training programs and it will continue to receive emphasis in the future. In economic analyses, construction costs are represented as a lump sum payment occurring upon contract award, the beginning of the so-called zero year. Savings and/or annual costs are then shown as starting in the year in which construction is completed. Savings and costs are then discounted back to the year of initiating construction (year zero).

## UTILITY SYSTEM

Mr. PATTEN. When do you expect to complete the utility system here?

Captain GINN. There is a sixth increment that we are programing into the fiscal year 1976 program.

## NAVAL WEAPONS STATION, YORKTOWN, VA.

Mr. PATTEN. Insert page I-86 in the record.  
[P. I-86 follows:]

1. DATE 19 FEB 1973		2. DEPARTMENT NAVY		3. FY 1974 MILITARY CONSTRUCTION PROGRAM			4. INSTALLATION NAVAL WEAPONS STATION								
4. COMMAND OR MANAGEMENT BUREAU NAVAL ORDNANCE SYSTEMS COMMAND			5. INSTALLATION CONTROL NUMBER 6805-750		6. STATE/COUNTRY YORKTOWN, VIRGINIA										
7. STATUS ACTIVE			8. YEAR OF INITIAL OCCUPANCY 1918		9. COUNTY (U.S.) YORK, JAMES		10. NEAREST CITY 20 MILES SOUTHEAST TO NEWPORT NEWS								
11. MISSION OR MAJOR FUNCTIONS Receive, store, overhaul, test, modify, explosive load and accomplish other related work pertaining to ammunition, explosives, expendable ordnance items, and/or weapons and technical ordnance material.  Major Functions: Overhaul, test, and assemble mines, torpedoes, advanced underseas weapons and guided missiles Act as Designated Overhaul Point for repair, refurbishment and retrofit of the Talos missile and missile component repair Receive, inspect, monitor, assemble, alter, store and issue classified ordnance/weapons Conduct research and developmental studies of explosive compositions and processes				12. PERSONNEL STRENGTH			PERMANENT		STUDENTS		SUPPORTED		TOTAL (9)		
				OFFICER (1)	ENLISTED (2)	CIVILIAN (3)	OFFICER (4)	ENLISTED (5)	OFFICER (6)	ENLISTED (7)	CIVILIAN (8)				
				a. AS OF 31 Dec 1972			80	606	2,351	0	10	7	0	208	3,262
				b. PLANNED (END FY 1975)			77	651	2,192	0	24	6	15	208	3,173
				13. INVENTORY											
LAND		ACRES (1)		LAND COST (\$000) (2)		IMPROVEMENT (\$000) (3)		TOTAL (\$000) (4)							
a. OWNED		11,157		1,375		67,065		68,440							
b. LEASES AND EASEMENTS		417* - Off		0		0		0							
c. INVENTORY TOTAL (Except land rent) AS OF 30 JUNE 19 72								68,440							
d. AUTHORIZATION NOT YET IN INVENTORY								4,257							
e. AUTHORIZATION REQUESTED IN THIS PROGRAM								1,327							
f. ESTIMATED AUTHORIZATION - NEXT 4 YEARS								11,271							
g. GRAND TOTAL (c + d + e + f)								85,295							
14. SUMMARY OF INSTALLATION PROJECTS															
PROJECT DESIGNATION				TENANT COMMAND PRIORITY	UNIT OF MEASURE	AUTHORIZATION PROGRAM		FUNDING PROGRAM							
CATEGORY CODE NO. a	PROJECT TITLE b					SCOPE c	ESTIMATED COST (\$000) e	SCOPE d	ESTIMATED COST (\$000) f						
216.40	TORPEDO OVERHAUL SHOP			/	SF	13,400	1,327	13,400	1,327						

## NAVAL WEAPONS STATION, YORKTOWN, VA., \$1,327,000

This station receives, stores, overhauls, and tests mines, torpedoes, advanced underseas weapons, and guided missiles. The station is the designated overhaul point for repair, and retrofit of the Talos missile and missile component repair.

The torpedo overhaul shop project is in direct support of the new MK-48 torpedo weapons system. Production of these torpedos is now under way and quantities will be issued to submarines based at Norfolk, however as the quantities in the Fleet buildup, the additional four lines provided by this facility will be needed by 1975. These torpedoes require recurring maintenance checkouts at 4 to 6 month intervals.

## Status of funds :

Cumulative appropriations through fiscal year 1973-----	\$31, 574, 000
Cumulative obligations, December 31, 1972 (actual)-----	27, 770, 369
Cumulative obligations, June 30, 1973 (estimated)-----	29, 118, 074

## DESIGN INFORMATION

Project	Design cost	Percent complete, Apr. 1, 1973
Torpedo overhaul shop-----	\$3, 000	50

Mr. PATTEN. I have no questions.

NAVAL WEAPONS LABORATORY, DAHLGREN, VA.

Mr. PATTEN. Let us turn to Naval Weapons Laboratory at Dahlgren, Va.

Please prepare and insert a 1390 justification page for the record.  
[The page follows:]

1. DATE 11 JUL 1973		2. DEPARTMENT NAVY		3. INSTALLATION FY 1974 MILITARY CONSTRUCTION PROGRAM			5. INSTALLATION NAVAL WEAPONS LABORATORY							
4. COMMAND OR MANAGEMENT BUREAU CHIEF OF NAVAL MATERIAL				6. INSTALLATION CONTROL NUMBER 6797-500			8. STATE/COUNTRY DAHLGREN, VIRGINIA							
7. STATUS ACTIVE				9. YEAR OF INITIAL OCCUPANCY 1918		9. COUNTY (U.S.) KING GEORGE		10. NEAREST CITY 28 MILES WEST TO FREDERICKSBURG						
11. MISSION OR MAJOR FUNCTIONS The principal Navy RDT&E Center for surface warfare weapon systems				12. PERSONNEL STRENGTH			PERMANENT		STUDENTS		SUPPORTED		TOTAL (3)	
				OFFICER (1)	ENLISTED (2)	CIVILIAN (3)	OFFICER (4)	ENLISTED (5)	OFFICER (6)	ENLISTED (7)	CIVILIAN (8)			
				a. AS OF 31 December 1972	55	90	2,777	0	0	0	0	0	0	2,922
				b. PLANNED (END FY 1975)	55	90	3,056	0	0	0	0	0	0	3,201
13. INVENTORY														
LAND		ACRES (1)		LAND COST (\$000) (2)		IMPROVEMENT (\$000) (3)		TOTAL (\$000) (4)						
a. OWNED		4,489		488		838		1,326						
b. LEASES		2		1		7		7						
c. INVENTORY TOTAL (Excludes land rent) AS OF 30 JUNE 1972								1,333						
d. AUTHORIZATION NOT YET IN INVENTORY								1,519						
e. AUTHORIZATION REQUESTED IN THIS PROGRAM								0						
f. ESTIMATED AUTHORIZATION - NEXT 4 YEARS								1,741						
g. GRAND TOTAL (c + d + e + f)								4,593						
14. SUMMARY OF INSTALLATION PROJECTS														
PROJECT DESIGNATION				TENANT COMMAND c	UNIT OF MEASURE d	AUTHORIZATION PROGRAM		FUNDING PROGRAM						
CATEGORY CODE NO. a	PROJECT TITLE b					SCOPE e	ESTIMATED COST (\$000) f	SCOPE g	ESTIMATED COST (\$000) h					
832.10	SEWAGE TREATMENT SYSTEM - FOR ADDITIONAL AUTHORIZATION AND APPROPRIATION (PL 91-511(FY 1971) PREVIOUSLY AUTHORIZED \$530,000)			-	LS	-	-	-	249					

Mr. PATTEN. You are requesting an amendment from \$530,000 to \$779,000, an increase of \$249,000, for a sewage treatment system at this location. What caused the increase in this fiscal year 1971 project?

Commander KIRKPATRICK. That was due to unexpected subsoil conditions we encountered in building the dike for the sewage treatment plant there.

Mr. PATTEN. We shall meet again at 10 o'clock tomorrow morning.

---

WEDNESDAY, JULY 11, 1973.

Mr. SIKES. The committee will come to order.

#### NAVY RESEARCH PROJECTS

Mr. SIKES. We are pleased to have with us today the Director of Intelligence, Rear Admiral Rectanus, to discuss certain Navy research projects; in particular, a classified project at the Navy Research Laboratory in Washington, D.C. Before we get into that, however, it may be useful to review some of the previous testimony we have had on Navy research activities for which projects are requested in this year's program, and to discuss generally the organization of the research activities of the Navy to see if there is a possibility that we are unnecessarily duplicating facilities in this area.

#### EXTENT OF DUPLICATION OF MISSIONS AND FACILITIES

Can it be said that there is a certain amount of duplication of Navy research missions and facilities at various installations?

Admiral MARSCHALL. Dr. LAWSON.

Dr. LAWSON. If I understood your question, is it fair to say there is a certain amount of duplication between various Navy research and development facilities?

Mr. SIKES. Yes.

Dr. LAWSON. To answer the question specifically, no, it is not fair to say there is duplication. There is work of a similar nature being done at more than one place. As an example, to pick a very simple one, the Navy is interested in both heavy torpedoes for its submarines and ships, and light torpedoes for its airplanes.

Mr. SIKES. I think you are saying a certain amount of duplication is necessary, is that correct?

Dr. LAWSON. No; I am saying that for a given technology, there are many applications, so we have people who are interested in materials work at several laboratories, some of them doing work on materials suitable for aircraft, others doing work on materials suitable for building ships.

Mr. SIKES. The committee understands the situation. The committee is trying to determine whether there has been a proper and careful screening to be certain there is not unnecessary repetition in the work being done. Can you get to that point?

Dr. LAWSON. I can assure you, Mr. Chairman, that that matter is very carefully watched by two sets of people, the people who spend the Navy's program money, project money authorized by Congress,

who want to be careful they are not supporting two parallel efforts unless there is reason for having two approaches to that problem.

As Director of Navy Laboratories, I am concerned that we give proper and adequate support to the people trying to carry out projects. So I watch carefully to be sure that we are not using two laboratories to do one job, because I don't have enough people to do all the jobs that we ought to be doing now.

Mr. SIKES. That is a good answer.

Mr. TALCOTT. I think the committee recognizes there are going to be similar research projects. In fact, if you are going to have eager and ambitious teams of people doing research, they are obviously at some time or other going to have almost duplicating projects.

What we want is assurance that when you get to this point, you don't have two people do the same thing. We want to have your assurance that you are not going to permit this duplicating or redundant research. We need assurance, because once in a while we find duplication.

Dr. KOSLOV. I wonder if I could address that question?

In addition to the control Dr. Lawson exercises, overall review of the labs, which tends to reduce the possibility of this happening—remember that most of the labs are in effect on an entrepreneurial basis as part of the Navy's system—they are competitors for funds in the 6.1 and 6.2 areas and systems area. When something gets beyond the point of essentially being an individual's idea which he may carry through, and we want to encourage ideas, he has to compete in a specific fund arena for funds at another level of review. It may be in the exploratory development area, for example. If he asks for funds in a particular program for development of a new torpedo, he has to go to the people in the Naval Ordnance Systems Command controlling those particular funds. They are, in turn, not going to pay out moneys for duplicate work. The probability is very low you can get anything beyond a single man or single team generation to the point where there would be a double program.

#### COORDINATION WITH OTHER SERVICES, UNIVERSITIES, AND BUSINESS

Mr. TALCOTT. We are short of funds, but we need research. We need assurance that somebody in the Navy is working with the Army and Air Force to make sure there is not duplication between the services, and also, looking to see if there is research that is useful to you going on in the universities and private businesses. There should be some oversight there so that you don't duplicate that either.

Dr. KOSLOV. Let me mention two oversight areas in this regard in line with the question of how do we interact with the other services. In the technology base area we now have a fairly complete set of Technical Coordination papers, and Area Coordination papers. Technical Coordination papers are devoted to a single technological discipline, or to a single area of warfare. These papers are interaction papers between the Army, Navy, and Air Force, where the people on the working level and first-line management level have to get together essentially on an annual or biannual basis and review all related work. Any sort of duplication shows up fast there.

Furthermore, we do find work going on in other services, which is going to be useful, there is adoption, of that work or joining of forces.

Mr. TALCOTT. All of us know of some examples of duplicated research work in universities.

Dr. KOSLOV. One of the problems with universities is ultimately the success of the university professor depends on publication. He knows, better than anybody else, if the work is redundant he is not going to get it published in a reputable journal. One procedure that we use, a second oversight procedure, is through the Office of Naval Research, which has a primary mission in the Navy of monitoring universities. This is done not only through our main office, the technology office in Arlington, but also by three branch offices in the United States—Pasadena, Chicago, and Boston (with a subbranch in New York), and through our branch office in London, which covers Western Europe and a good deal of Eastern Europe.

They continually go through the university community trying to find out what they are doing which would be of value to the Navy, in fact, to the other services as well. This has been very productive.

Mr. TALCOTT. Thank you.

#### DUPLICATION OF FACILITIES

Mr. SIKES. Could you cite some examples wherein the Navy has purposefully duplicated missions or facilities in order to carry out a better R. & D. or testing program?

Dr. LAWSON. As far as I know, sir, the duplication of facilities is a difficult question. All the labs have screwdrivers and hammers. They all have oscilloscopes at the \$1,000 level, but when you speak of facilities do you restrict yourself to major facilities?

Mr. SIKES. Yes.

Dr. LAWSON. No. In some cases I have intervened when somebody wanted something and said, "No, you can use an existing one." Unless one takes the time to go in considerable depth in the capabilities of any particular major facility, they may look alike but actually be quite different.

Mr. SIKES. Does that mean that we have facilities that are redundant, that we have more facilities than are required?

Dr. LAWSON. No, I don't think it means we have more facilities than are required, but I am becoming concerned at how our existing plant is becoming obsolete compared to modern standards.

#### RESEARCH FACILITIES MODERNIZATION

Mr. SIKES. By modern standards, what do you mean? Industrial standards or university standards? What standards are you using?

Dr. LAWSON. We are dealing with more sophisticated ones, and for environmental test chambers we now would like to have bigger ones. We are making do with what we have.

Mr. SIKES. This is a very important subject.

Dr. LAWSON. As a concrete example, we are seriously talking about a Navy capable of 80 knots. I would feel much better if I thought I had adequate seakeeping facilities, test facilities, tow tanks, and so on, so that I could assure the Ship Systems Command we were able to run adequate tests.

Mr. SIKES. Are you talking about the need for complete modernization of our research and testing facilities? Are we seriously reaching a

point where we don't have facilities that are modern enough to stay abreast of the requirement?

Dr. LAWSON. Mr. Chairman, at the moment I am concerned that we are approaching that. I cannot truthfully say we are in a crisis situation, but we are approaching the situation in which I feel we are going to find increasingly that we are limited by some of the facilities we have.

Dr. KOSLOV. Mr. Chairman, if I may interject one point. There are three criteria in any decision on the facilities. One is, what percentage of the time is it actually being used, if you have more than one? If you have two being used 100 percent of the time, that is not duplication. The first point is the percentage of utilization. The second point is the question of, is the facility there where it is needed? This is an issue that comes up very often in the computer area. The purpose of the Navy having computers in its labs is not the efficient utilization of its computers; it is the efficient utilization of the manpower by means of computer support, which is a much greater expense than the cost of the computer itself.

The third point Dr. Lawson addressed is the question, is it adequate for the foreseeable technology change that we are coming to exponentially in time? The mere fact we have a technology change and institute it in a new facility and add it right now because we must have it, generally is not adequate.

We know in order to effectively utilize any facilities, you have to build up a team activity and ability to use that, the integration of a man and facility. We are concerned that we are perhaps not putting adequate investment into the future of the technology base by getting the facilities we know we are going to need downstream and developing the teams, labs, and support facilities for those major facilities. That is a serious concern. We are fighting a very determined and very technologically oriented enemy. We have a pretty good idea of the facilities he is building, a pretty good idea of the technology vectors he is taking. We feel that we constantly have to make sure that we are capable of understanding what he is doing and matching it.

Mr. SIKES. If you translate that into terms that are readily understandable, it would be useful for this record. In other words, can you give us comparative figures on what the enemy is spending for research and development facilities compared to what we are spending, the rate of modernization that he is putting into facilities compared to the rate we are allowing our Navy under the budget restrictions?

Dr. KOSLOV. I think we can supply some figures for the record. Dr. Foster may have previously supplied similar figures.

Admiral RECTANUS. We will endeavor to do that, Mr. Chairman. That is fraught with all kinds of caveats, but we will attempt to provide that information.

Mr. SIKES. I realize it is somewhat difficult, but if you could give us a good feel for the comparison in R. & D. facilities and the degree of modernization, it would be useful.

[The information follows:]

Access to and analyses of the Soviet R.D.T. & E. expenditures are difficult. Precise equivalence of dollars and ruble values is difficult to define. From the \_\_\_\_\_ information we have, it is difficult to break out the facility investment values and it is even more difficult to specifically identify the investment directly related to naval development.

We can, however, provide some examples which clearly show the relevant growth of expenditure rate. Among the Soviet research and development establishments, at the present time, \_\_\_\_\_ facilities have been identified as dedicated to naval R.D.T. & E. representing an \_\_\_\_\_ increase in number since 1960. This is substantially greater than the number of similar U.S. facilities. The ratio is difficult to establish due to the mix of Government and industrial facilities in the United States which may be partly utilized for the Navy; the same situation pertains in the U.S.S.R. It is known that much naval research is contracted out to research institutes of the Academy of Sciences and to various educational institutions. Also, Soviet research is often conducted within manufacturing plants, particularly in areas of applied research closely related to the final stages of a weapon system.

A particular point of facility comparison in the Krylov Institute, Leningrad, compared with the Naval Ship Research and Development Center, Carderock. In the 1960 to 1970 period, there has been a \_\_\_\_\_ increase at the Krylov facility; a 20 percent increase at Carderock. At present we estimate that Krylov is \_\_\_\_\_ larger. It has \_\_\_\_\_ more modern towing tanks as well as other \_\_\_\_\_ technical facilities not available at Carderock.

The Krylov Institute appears to employ about \_\_\_\_\_ times as many professionals as Carderock. It should be noted that a number of graduates of the Soviet Union technical programs in the fields of naval architecture and marine engineering are three times as large as the United States on an annual basis. Since the distribution of emphasis in technical training in the Soviet Union is moderated on a national level, we must assume that these numbers are directly related to available or anticipated facilities.

Another relevant indication is the number of new classes of ships introduced. The amount of research and the infrastructure necessary to support the design and construction of new warships is formidable both from the point of view of hull and component systems design. Since 1960, the Soviets have introduced \_\_\_\_\_ new classes of major combatants \_\_\_\_\_ of submarines and \_\_\_\_\_ classes of minor combatants. [In the same period the United States introduced 14 major combatant classes, eight of submarines and two classes of minor combatants.] This prodigious Soviet effort required a major investment to replace the war-ravaged research establishment with modern facilities and equipment and was made on an inferior national economic base.

Taking another point of view, the Soviets have invested heavily in their study of the oceans themselves. Between 1960 and 1970 they have put into service some \_\_\_\_\_ times as many oceanographic research vessels as has the United States. \_\_\_\_\_.

The current book value [replacement value] of the 11 large U.S. naval materiel laboratories is about \$600 million. These laboratories have been receiving about \$20 million annually for MILCON. Of this, 60 percent is dedicated to modernization or replacement of obsolete and antiquated structures. Only 40 percent supports new technology, or, roughly, 1 to 1.5 percent typical of the annual growth in technical capabilities. Relative to the overall level of R.D.T. & E. to the Navy budget, the R.D.T. & E. MILCON should be 10 percent, it has been about 5 percent in past years, but more recently, as low as 2 to 3 percent.

As we look at the overall growth of Soviet R.D.T. & E. facilities, we find that the growth rate in the early 1960's was of the order of \_\_\_\_\_ slowing down to about \_\_\_\_\_ in the late 1960's. This is also reflected in terms of changes the U.S./U.S.S.R. ratios of professional personnel employed in R.D.T. & E. In 1960 the United States had approximately twice as many as the Soviet Union. By 1968 the numbers were about equal and by 1970 the U.S.S.R. was probably about 10 percent higher with the gap continuing to widen.

Thus using these few examples the pattern we see, characteristic of other examples, is, a very heavy investment pattern for facilities in the early 1960's, and a continuing growth rate greater than ours resulting in a Soviet R.D.T. & E. facility structure significantly more modern and more rapidly expanding than our own.

Mr. SIKES. Mr. Long?

Mr. LONG. Terms such as obsolescence and modernization often are matters of economics. Probably 95 percent of our Nation's working resources, capital machinery and infrastructure, are obsolete from some absolute point of view. Whether we want to keep it all up is a matter

of the resources we have, and how we want to allocate them between present and future needs. We are pretty rich, but we are straining our resources. It is difficult for this committee to sit here in judgment on whether we ought to vote considerably more money for new hospitals and other projects because we don't know how urgently you need it. There are many degrees of obsolescence—you will agree with that.

#### DEFENSE AND RAPPROACHMENT APPARENT CONTRADICTIONS

As I sit on this committee day after day, I almost feel as if I were in a different world, as if our Government were being run by two completely different leaderships, each of which is completely lacking in communication with the other. When I come in here I read how the Russians are threatening us and spending vast sums to build up their navy. I have no doubt the Russians are doing the finest kinds of research, and we must strain to keep up with them.

When I go to the floor, however, I am asked to vote for commodity credit loans to the Russians to help them with their economic problems. We had a big wheat sale, as you know, at disadvantageous terms for the United States. We are being asked to help them with various sorts of computer and other problems. I don't know whether the leaders in our Government are communicating with each other. Either the Soviet Government is a threat or it is not. If it is a threat let us stop helping it so much. We are giving the Russians tremendous help economically, which enables them to go ahead full blast with the building of ships and technology. I understand that this is not your problem. You have to do the best you can, but I want to get it on the record that I think our Government is pursuing a totally ambiguous policy here, which is totally confused because it helps with the one hand and asks to fight with the other. I am protesting.

Mr. TALCOTT. Mr. Chairman, I think that the Doctor's points are well taken, but they may not be completely accurate. I think it is a very good public policy to try to get on better with our former enemies and be more friendly with our foes. I think we are proceeding well.

We have to defend against possible threats but we have to make sure that we get along better with our allies.

Mr. LONG. I don't doubt that, but probably we are frightening them as much as they are frightening us. Every time we launch a Trident missile program, my guess is we are scaring the heck out of them. This is not my idea of a good way to get along with them, if that is your purpose.

I don't know what our purpose is. I don't think anybody here in this room knows what our purpose is, because I don't think anybody in the top level of government has thought through our purpose. We are just putting on a shingle here and there because the roof leaks.

Mr. SIKES. I have not found it that difficult to understand what we are doing. We are trying to have what is necessary for defense, if the resources of the country and the disposition of the Congress will permit that, and we are trying to establish better understanding with the other principal powers of the world in the hope that at some time in the future these defense expenditures won't be as essential as they are now. I don't find it too difficult to understand that.

Mr. LONG. At the same time we are helping our enemy economically. I can agree that we should search for understanding, but I don't believe

that understanding requires that we give large sums of money in foreign aid, and that is what we voted yesterday at the administration's behest. We voted for commodity loan credits to the Chinese and Russians.

I voted against it. I don't believe that this is one of the requirements of understanding. Let us sell them the wheat, but sell it to them at market prices. Let us stop this business of giving all kinds of grants and subsidies, and so on, and make up our mind what we are trying to do.

Mr. McEWEN. Would the gentleman yield?

It is an intriguing and pleasing thought that we might progress some day so far down this road that they become so dependent on our feed grains, we become so dependent on their energy from Siberia, that neither one would dare attack the other because we would not survive without the other. Maybe this is the first step down that road.

In the meantime, does the gentleman feel that we have got to maintain the defense of America just as the Soviets are maintaining theirs?

Mr. SIKES. Gentlemen, I think we have got the situation well stated. Let us get back to the bill.

Mr. TALCOTT. We should not argue in front of these gentlemen, but I do want the record to show we cannot sit still. We have done as good a job in international affairs as we have done in decades. I don't want that to be obscured.

Mr. SIKES. Very well. Let us get back to the bill.

I recognize the budget problems and they govern military construction decidedly.

#### NAVY REQUESTS FOR R. & D.

What level of new facilities and modernization has the Navy attempted to obtain in research and development, and what percentage of your total budget request did you actually get?

Admiral MARSCHALL. In military construction?

Mr. SIKES. Yes.

Admiral MARSCHALL. We don't have the precise figures. This year we are requesting approximately \$25 million excluding Trident out of approximately \$697 million, a very small percentage.

Mr. SIKES. That is what you have come to this committee with?

Admiral MARSCHALL. That is right.

Mr. SIKES. That is what you asked for?

Admiral MARSCHALL. That is what we have asked for, as I recall, about \$29 million.

Mr. SIKES. Do you understand the question? Is that what you asked the Navy to approve as part of the budget?

Admiral MARSCHALL. This is what we come to the Congress with.

Mr. SIKES. What was your initial request to the Navy?

Admiral MARSCHALL. I would have to provide that for the record. I don't have the information.

[The information follows:]

The Navy submitted \$26.2 million to OSD in R.D.T. & E. projects plus an additional \$13.7 million for supporting facilities at laboratory installations. Of these amounts we received approval for \$20.7 million for R.D.T. & E. plus \$7.2 million in supporting facilities. A project not originally requested, added just prior to the program was sent to the Congress which increased the total request excluding Trident to \$25.4 million for R.D.T. & E. facilities.

Mr. SIKES. Dr. Lawson, you probably would know. Are you getting about as much as you asked for? If so, are you given guidelines so you had no flexibility?

Dr. LAWSON. No, sir. I am getting approximately half of what I asked for.

Mr. SIKES. Do you think that that would be a proper balance if you were to double the research and development facilities? Would that be adequate for modernization as you see the need which now exists?

Dr. LAWSON. As far as MilCon goes, it should be adequate.

Mr. SIKES. We are talking about MilCon.

#### MISSIONS OF UNDERWATER AND UNDERSEA LABORATORIES

Mr. NICHOLAS. I have a question whether the Navy purposely in some instances has duplicated missions of some of its research activities. I am thinking of your underwater and undersea labs. There may be other instances. I think you probably have a good reason for it, but you should state why or to what extent you have done this and why you have felt it is necessary.

Dr. LAWSON. No question but what NUSC Newport and NUC San Diego appear to the casual observer as two very similar labs. They in some ways are. They are both concerned with the Navy's problems, particularly in the ASW area. Because of that—and you gentlemen are not the first to ask me that question about those two labs; I get asked by the Navy quite often—they are in fact different. The easiest distinctions to see and explain are that the lab at Newport and New London is primarily concerned with the heavy equipment, sonars, torpedoes and fire control systems for surface vessels and submarines. If there is a bias, they tend to be submarine oriented. The lab in San Diego is primarily concerned with lightweight equipment for aircraft and high-speed surface vessels, such as hydrofoils, and with underwater surveillance, particularly the SOSUS system. We need, I think, at least as much effort as those two labs provide because there is no question in my mind that the ASW problem is the Navy's most important military problem. The submarine is a different beast now than it was during World War II, both ours and theirs. It represents a much broader spectrum of threat than it ever has before. Therefore, it may well occupy the attention of a fairly large fraction of the Navy's technical people.

In addition to those two distinctions between the sort of heavy weapons lab in Newport and the lighter weapons lab in San Diego, there is an additional difference in terms of, let me call it their operating philosophy. The Newport lab spends a fair fraction of its effort, around half, depending on what year you are talking about, in what we call fleet support; that is, direct assistance to the operating fleet. They send engineers out to modify and update equipment on ships. The lab in San Diego does some of the fleet support work, but their philosophy is more toward innovation, technologically new kinds of work. They tend to be more innovative, more forward-looking, constantly generating new ideas. The labor in Newport tends to be working with existing systems, supporting them in the fleet, as well as improvements through research in that area.

Mr. NICHOLAS. Would you agree with this: Two Navy labs—referring to the Undersea Center and Underwater Center—both working in the same area, were intentionally created as competing labs in compliance with the principles stated by D.D.R. & E. in 1964, that within each mission area there should be two labs in the Department of Defense.

Is there some logic in that? Even though they have areas toward which their work is directed, they are competing, attempting to develop alternate solutions to various problems: Do they have to some extent duplicate facilities?

Dr. LAWSON. Yes, sir, they do. This harks back to the point Dr. Koslov brought up. Faced with a military problem, it is nice to have two technical organizations competent in the business apply different criteria, different ways of approaching the problem. Do we upgrade an existing fire control system or should we build a new fire control system? If so, what kind? This clash of ideas and approaches provides the Navy internally with alternative approaches well thought out, so it can make much better decisions than it would make if it only had one thread of technical effort.

Mr. NICHOLAS. Are there other areas in which you allow a certain amount of overlap or interaction, whatever you want to call it, in order to achieve the same thing? This is one example where the names are similar, but are there other areas?

Dr. LAWSON. There is one other area in which this kind of interaction goes on although it is not as direct and as obvious competitive a situation.

That is in the general arena of antiship missile defense. The people at Dahlgren basically are gun oriented people; they are working hard on how you counter missiles through that mode. People at China Lake and elsewhere, who are more missile oriented, are investigating what one can do with missiles against that threat. The end result is the same, we are trying to protect the ship, but there are tough technical questions. The distinction between guns and missiles or jammers is a very tough question to answer. The best way I know of doing it is by getting competent engineers in those fields sitting down and arguing about it.

#### DUPLICATION TO ENCOURAGE COMPETITION

Mr. STOKES. How much duplication is there among Navy activities in terms of research capabilities and facilities so as to allow Navy laboratories to compete for work under the industrial fund? Provide an answer to that for the record.

[The information follows:]

There are no laboratories that have been structured organizationally or with facilities for the purpose of making them competitive with one another. All the Navy laboratories have engineering and scientific commonalities in such capabilities as the following:

Physics, electronics, microelectronics, chemistry, mathematics, industrial engineering, ocean sciences, aerodynamics, and acoustics. All of these vary in application to the degree of technology required in supporting the different missions and specialties of the laboratories.

While there are duplications in disciplines, the duplication in facilities appears far less frequent. In most instances research facilities that appear to be duplicative are generic and not competitive. Descriptive titles or category codes tend to make them appear identical but in the main, unique and specialized technical facilities have sizes and technical characteristics tailored for weapons

systems and technologies peculiar to but one mission. This is particularly true in respect to planned and budgeted research facilities of the past decade.

The Navy MILCON cannot afford competitive duplicative facilities. Laboratories are encouraged to utilize special facilities of other laboratories to preclude unwarranted procurement of real property and equipment. NAVMAT P-3999-1, Department of Navy, research, development, test and evaluation. Navy technical facility register, volumes 1 and 2 is submitted separately to the committee with the attention invited to page 3 and the Navy's policy in sharing scientific facilities.

Mr. SIKES. Can you cite some specific examples for the record of duplication of facilities for this reason and indicate why you feel this is necessary in these specific instances?

[The information follows:]

No duplicative facilities have been built. There are facilities that appear similar as follows:

In the science of chemistry the Naval Ordnance Laboratory (NOL), White Oak, Silver Spring, Md. and the Naval Weapons Center (NWC), China Lake, Calif. have facilities for development of ordnance components. The technology at NOL is directed toward explosives and at NWC toward missile propellants.

In the science of aerodynamics the NOL and the Naval Ships Research and Development Center (NSRDC), Bethesda, Md. each have wind tunnel facilities. NOL facilities have characteristics suitable for ordnance and ballistic research while NSRDC research is applied to ships and aircraft modeling.

In the ocean science area hyperbaric or high pressure tanks exist at most all of the laboratories. However, the Naval Coastal Systems Laboratory, Panama City, Fla. has the only facility capable of testing man/machine equipment interfaces. Similar facilities at other laboratories provide for material and structural testing endemic to their missions.

In ocean sciences there are acoustic measurement facilities at Lake Seneca, N.Y. and Pend Oreille, Ind. under the cognizance of Naval Underwater Systems Center (NUSC), Newport, R.I. and NSRDC respectively. These facilities are similar. Both bodies of water are needed to satisfy programs on very large but differing sonar systems. In addition, the Pend Oreille facility supports very important effort in ship silencing. The facilities are fully utilized and not considered duplicative, since the systems under test are not duplicative.

In electronics there are electromagnetic anechoic facilities to test the vulnerability of weapons to electromagnetic radiation at the Naval Weapons Center, China Lake, Calif. and the Naval Weapons Laboratory, Dahlgren, Va. Both facilities will accommodate all of the Navy's missiles but Polaris and Poseidon. While the enclosures are similar, the energy absorbing characteristics differ to satisfy dissimilar test requirements.

In support of engineering development all activities have technical service shops to model and breadboard systems and components peculiar to the mission of the activity. These shops are similar in function, most of the equipment is comparable and duplicative. The shops are not duplicative in the sense that they are fully utilized and support differing missions and hardware. The same can be said for the technical computer installations at each laboratory.

#### DUPLICATION OF DISCIPLINES

Mr. SIKES. A report by the committee's surveys and investigations staff indicates that there is considerable duplication at Navy research activities with regard to the scientific disciplines involved at various installations. For instance, I will cite the following areas and the number of Navy activities which are involved in each:

Behavioral sciences: two medical and six other labs involved in human factors engineering; and six labs involved in man-machine relations.

Biological sciences: 12 laboratories involved in biochemistry; 6 labs involved in bioengineering; 8 labs involved in life support projects; and 8 labs involved in physiology.

Electronics: The Naval Electronics Laboratory Center and eight others involved in electronic and electrical engineering.

This would appear to be a massive duplication of disciplines. Will you comment?

#### RESEARCH ON MAN AND HIS RELATION TO MACHINES

Dr. KOSLOV. I will start first. I couldn't have asked for a better question. I guess that I have for many years, as Dr. Lawson has and Dr. Frosch did when he was assistant secretary, been most concerned about the problem of human beings in the military system. After all, the bulk of our costs are in the human. The most intelligent part of the system, bar any advance in computers, is the human being, the one who makes a decision, recommends the patterns and fires the gun is the human; he is not a single system. He is a part of every military system, a very integral part.

As a human being, he consists of a large number of subsystems. He has a nervous subsystem, endocrine, biochemical system, emotional and a behavioral subsystem. In every one of these categories we have to make sure that that man and the mechanical subsystem, which is such a terribly poor approximation of what has been created by greater authority than the ASN, R. & D., we have to make sure those things match.

Take our biochemical work. I can give you quick examples of that. We found in the Pensacola lab a possibility, we are now talking about preliminary results, but we find there are some changes in the triglyceride levels under radiation stress, we find up at Wartminister, Pa., that pilots who are under stress conditions show some change in triglyceride level. That is a—

Mr. TALCOTT. What is that?

Dr. LAWSON [continuing]. Chemical in your bloodstream.

Dr. KOSLOV. It seems to be related to a condition of stress in the system. In other words, it is a byproduct of the neural activity. It is a secondary product of the neurohormone action. It seems to be related to stress conditions. The people in Warminister are concerned about this primarily because of the fact that we have to have some way of predicting whether a pilot can handle a highly complex aircraft before he gets to the area and takes off from a carrier deck. One long-range approach. Can we monitor these through the biochemistry of the body as well as through the normal commanding officer judgment factor? The people down in Pensacola are looking at this kind of problem in terms of what our safe level for radiation is.

If we go to NELC we find people who are looking at the evoked cortical potentials of the human. We are looking at the evoked cortical potentials of other animals. By looking at evoked cortical potentials we find that we can determine what the visual acuity of an individual is. It turns out to be a technique adopted in the civilian world more rapidly than we have been able to do it in the Navy. It is a way of determining ophthalmological problems in infants. You can not get an infant to read an eye chart, but put things in front of him to see whether he sees them sharply or diffusely. We have again this problem of a man who has to react in split seconds. He has to react basically in milliseconds with systems that perform in microsecond

measure. We must be able to be sure that the man is getting information. We have to be able to monitor his performance. He has to know his own performance. So we have the electronics lab concerned with electronics systems as a byproduct of research looking at how the human being appears electronically. It turns out in fact there is a measure in the form of these cortical potentials. If you go into the Panama City lab as well as into the Naval Medical Research Institute at Bethesda—

Mr. SIKES. You know the right ones.

Mr. TALCOTT. Panama City, Canal Zone?

Dr. KOSLOV. That is a sister city with the one in Florida that celebrates its founding on the same day.

A deep diver under stress conditions of diving has conditions monitored by biochemical behavior, by change in the biochemistry. We have still many uncertainties in exactly how long and under what depths we can put a diver. This involves a great deal of biochemical research in terms of the deep-diving physiology. I could go on for many days and many hours on the whole question of computer pattern recognition. To what extent can we share the marvelous ability of the human, who is a marvelous pattern recognizer and occasionally a good decisionmaker, but a terrible computer? He does arithmetic terribly slowly. The human is a terrible computer.

Mr. LONG. That depends on how you define it. I have heard computer specialists say they could never make a mechanical, electronic computer compare with a human computer in some aspects.

Dr. KOSLOV. That is right. This is his differentiating point. What are the characteristics you would like in a computer? You would like to have an arithmetic characteristic that adds and subtracts and multiplies. You would like to have it remember things. You would like to have it recognize patterns, something which appears diffusely across a wide field, and then you would like to have it do something about it. In the latter two things, recognition of a pattern and the ability to decide what to do about it, the human far outstrips the computer. I suspect people always do so, but when it comes to the rate of arithmetic operations, the human being is a pygmy. When it comes to memory, the human is trivial. He cannot remember all the data, fantastic amounts of data. In any event, in every one of the naval labs dealing with these very complex weapons systems, there is constantly the problem of where do you match the man to the machine? That has two distinct sides to it. One side is, how do you make the machine conform to what the man can do? This is a mechanical side, a materiel lab kind of problem. Where do you put the knobs? How large are the dials? How do we put in backup?

The other side of the fence is the human himself. How do you change the machine to accommodate his rate of reaction, his ability to recognize patterns? His stress conditions? We have to do this for a torpedo system. We have to do it for an aircraft system. We have to do this for antiship missile defense system, and down the line. It is not at all strange that if somebody goes and takes a first look and tabulates what are the areas of research—and indeed we have 11 large materiel labs—forget the medical and personnel labs—but I am shocked that he didn't find the same line here in every one of the 11. He should have.

You have to look a little deeper at why these things are there. They have to be there and we are appalled when we don't have them. One of the problems that we are facing now, we have gone through a major change in the personnel lab system to put greater emphasis on understanding human performance and human behavior in line with their operation of the military system.

Mr. SIKES. The investigative report did not say there was necessarily anything wrong with this duplication; they pointed to the fact there are these activities taking place in many labs where the same subject is under study.

#### COORDINATION OF SIMILAR RESEARCH EFFORTS

I think a very important question now is, where is it all coordinated? Where are the results consolidated? Where are we getting with the activities taking place in so many labs? Are we making progress?

Dr. LAWSON. Yes, sir. But without meaning to be disrespectful, you are taking a rather narrow view of it. There is in fact considerable—

Mr. SIKES. I mean to. The committee wants to know about results. If that is narrow, tell us what you are getting.

Dr. LAWSON. The committee and the Congress judge the Navy on the adequacy of the weapons systems it produces. We may use mechanical engineers both in building airplanes and in building torpedoes. I hit on these examples. Those mechanical engineers because they are both professionals do talk to each other, their work is published in journals which other members of the community read. There is a lateral coordination.

Mr. SIKES. You may have misunderstood the question. Getting back to the fact there are many labs which are involved in the same activity, 6 labs involved in man-machine relations, 12 in biochemistry, 8 in support functions, 8 in physiology. Where is it all coordinated? Where is there a consolidation of results so we may know what the answer is to problems such as those that are being discussed here?

Dr. LAWSON. That coordination is of two forms. One is the natural intention of the professional in the field to keep his fellow professionals informed of what he is doing and to keep informed on what they are doing. There are also mechanisms set up, more formal ones that look across the Navy's applied research and exploratory development programs in order to see to it that the work is coordinated and to promote the interchange between the professions.

Mr. SIKES. Does that mean there is cross-fertilization between the 12 labs involved in biochemistry? Each has the benefit of the advances and discoveries made by the other?

Dr. LAWSON. Yes, sir.

Mr. LONG. Would the chairman yield?

I am not sure that you have answered the chairman's question. I spent most of my life in research before I came to Congress, and I know a little about how it works; and further suspect it works pretty much the same in all areas. The individual scholar does keep up with what is going on elsewhere, there is a good deal of cross-fertilization, but it works in styles and in fashions. It is an awfully haphazard business. Sometimes it works brilliantly, and sometimes it just does not work at all.

I think you have got to have a great deal of that type of haphazard communication, because I don't think anybody should direct it from the top. You should leave it up to the individual, because nobody knows what creativity is.

Dr. LAWSON. It is also true that the important information moves very fast.

Mr. LONG. If people are interested in it. What you mean by "important" depends on what people are interested in. There is an awful lot of important information in this history of science and in any of the intellectual fields nobody paid any attention to because they didn't think it was important.

Dr. LAWSON. Perhaps I should have said fashionable.

Mr. LONG. It was not in fashion.

Dr. LAWSON. That is true.

Mr. LONG. I grant you get all this cross-fertilization, but it ought to be allowed to continue and be given maximum encouragement through the journals. You have to publish it and not keep it a secret. Where in naval research is there somebody who puts together what needs to be put together at a particular time? The Navy has not quite the same mission as do individual scholars and research people. Do you follow that? I think that is what the chairman is talking about.

Mr. SIKES. Exactly.

Dr. KOSLOV. That is an extremely important point. The Navy research mission is not merely to enlarge scientific knowledge, but solve problems of the Navy and anticipate problems. I think at the line where the results show up, I could make a twofold split. First they show up in the specific system, that is, the system works with the man in the system.

In this case, in this particular research there may be many fields that fit into a system. Physicists, biochemists, electrical engineers, mechanical engineers, and ultimately you put in something in the arch that forms the system. Each one puts in a particular stone. No one stone is the keystone. The second place they appear is in the broader fields that concern the decisions as to which system you are going to make and what direction are you going to go? Let me use the example of Panama City, Fla., or the Bethesda facility.

Those are both hyperbaric facilities. They serve different missions. In Bethesda a lot of the mission is devoted to the longer range biological, physiological exploration. Can we go to a 3,000-foot depth with man? We are going to start it with animals first. We know that we can go to about 2,000 feet right now with man, but that is still a different area. In Panama City, where there is a much larger chamber capable of going to 2,000 feet, we are looking at how a man can perform in conjunction with hardware systems? Obviously those who communities along with the submarine medical community at New London talk to each other continuously.

They are constantly meeting and holding reviews and seminars and very often sending their people back and forth in order to integrate the man in the sea, free man in the sea, solve problems of survivability aboard submarines, problems of submarine rescue, and so on. You couldn't define a particular result from this entire complex of research but what you can define in this case is that the field of activity, which is a uniquely naval field, is constantly progressing and meeting re-

quirements of going to greater and greater depth. I think these two categories, a system at work in the field on that which seems to be able to supply the answers needed to make systems decisions.

Mr. SIKES. Thank you for the illustration.

To make this a little more intelligible for the record we should have some samples of the things that we have been talking about in these various areas to show there is a need for this with as many labs operating in as many areas as the investigative staff has reported. Provide that for the record.

[The information follows:]

The Navy's laboratories, and particularly the naval material laboratories, are primarily interested in satisfying the known and forecasted naval military problems. In order to provide effective and timely solutions, they must have assets which include capabilities in the supporting sciences and technologies. In general, the development of diverse equipments, various vehicles, multiple weapons, many of the hardware systems, and the machines and tactics of the many warfare areas is dependent upon support from the common areas of science and technology. An apparent redundancy of these sciences and technologies among the Navy's laboratories is therefore an expected and necessary basis for their successful work.

One example of this apparent overlap is in the science of metallurgy. Wherever the equipment, vehicle, weapon or other hardware has operational requirements such as strength, weight, hardness, thermal environmental resistance, machinability, et cetera, some local knowledge in this field of science is necessary. This does not necessarily mean that basic research need be carried on, but rather that the knowledge be present to allow the applied research and adaptive engineering necessary to produce effective hardware.

Another example of a similar redundancy is in the area of electronic component technology. The use and demand for ability in this field extends to functions such as communications, surveillance, command and control, weaponry, intelligence, countermeasures, and into almost every current military requirement. Electronic components will be found in such diverse equipment as ships' boilers, hydrographic buoys, weapon fuzes, voltage and frequency regulators for shipboard power, computer and data presentation devices, biological support systems, sonobuoy transmitters, and on and on.

Dr. KOSLOV. Mr. Chairman, is it possible for us to receive a copy of this report?

Mr. SIKES. Yes. It will be made available. It will take some little time but you will receive a copy.

Mr. TALCOTT. Mr. Chairman.

Mr. SIKES. Yes.

#### SUCCESS IN MEETING R. & D. GOALS

Mr. TALCOTT. I am trying to get some answers here, too.

It seems to me that, as we listen to the researchers and the expert scientists, it still has to be converted to our language. I am wondering if you could put in the record a statement of your mission in research and development, specifically defined, not just that it is to win the war. We need a specific definition of your mission for research and development so that we can measure your accomplishments. I would like to know what degree of success you have achieved in the accomplishment of your mission.

We continuously allocate all kinds of money to R. & D. It seems to me we just get very general answers, such as: we are developing adequate machines and weapons systems and working with personnel to win wars. We have won wars so we have succeeded in our mission.

I think we have to be more specific, to have specific missions, "very narrow" highly defined. Then we can judge fairly and accurately the degree of accomplishment of your missions.

Am I wrong in my question or my attitude toward what you are trying to do?

Dr. KOSLOV. No, I think that the question is one which is completely justified in terms of the allocation of national resources for military R. & D.

Mr. TALCOTT. I think we have to know whether you are achieving your mission and we are getting our dollar value out of R. & D. as we are getting our value out of weapons, or health, or education, or poverty programs. We don't seem to have a handle on R. & D.

Dr. KOSLOV. May I take a crack in answering that question in brief?

Mr. SIKES. Yes.

Dr. KOSLOV. I think that in the Navy R. & D. program, as in any military R. & D. program, you have a dichotomy. One is, you have to maintain the technology base needed for the Navy mission. I will come back to that point.

#### LASER RESEARCH AND DEVELOPMENT

Second, you have to make sure that the fleet gets the weapons as fast as they can in terms of what the new technology is. Let me give you an illustration of that. One area in which the Navy was a heavy investor, in fact I think the Navy claimed to be the initial supporter on this field, was in the laser-maser business.

Mr. TALCOTT. Was that sheer luck or did you set a goal?

Dr. KOSLOV. That was not sheer luck. It was clear that in the beginning there were several. That is a very good example. If we look at the history of the laser-maser business, I suppose the proper place to start is somewhere before World War I, when Einstein published a paper on the principle of detailed balance.

If you could, it was theoretically possible to get energy states up to a higher level, and then by virtue of the presence of having many excited atoms, they would tend to force themselves to drop to a lower state. That is the principle of detailed balance. Before World War II, it became clear that there were specific systems. This was published in both the Western and in the Soviet literature, the 1938-39 period. There were some specific systems that would behave this way.

The Office of Naval Research picked up the work of various investigators because it clearly fell into a couple of fields of naval interest. One, it specifically afforded a means of getting a frequency standard, highly stable, measurable frequency, something of tremendous concern in any military system. Two, it is obviously also a way of converting energy from one form—namely, distributed frequencies—to something that has a specific frequency. Anything which is a new energy conversion is of immediate interest to the Navy, which is one of the largest energy consumers. I hope it is also an enemy consumer. I hope that is true.

While I don't think anybody specifically thought we would have a zap gun, as one committee previously called it in 1938 or 1939 or early 1940 when we picked up the work, I think the fact that these two areas were present was a reason for picking up this particular one.

A third area was that if you had these tools, namely, a way of getting a unique, high, frequency defined energy.

There is a third general classification of interest. The Navy has been beset by material problems. We are dealing with the totality of the natural environment from extreme depth to high altitude. And the ability to develop the forms of energy which have a definite frequency characteristic, I think was immediately apparent as a diagnostic tool for material problems.

So there were three reasons here which were very specific and were certainly thought of, and I think you could probably wade back through the record of justifications and their equivalent, and find these reasons legitimately put in.

What actually happened was the laser was developed in the middle fifties and it turned out to be capable of getting higher and higher energies and is now a standard measurement tool for material studies and all kind of timing and distance measurements. There are innumerable applications in the Navy and the other services, and in fact it has now turned out to be a very, very viable weapons system in itself. In other words, we can get so much energy converted we can have a weapon. In fact, I think we are up to about \_\_\_\_\_.

Mr. SIKES. Are you up to the zap gun yet?

Dr. KOSLOV. \_\_\_\_\_.

Mr. SIKES. I am glad you brought up the laser question. Is what the Navy is spending in its research program as much money as you could usefully spend?

Dr. KOSLOV. That question has been raised, and I believe the best way to answer that is that yes, we believe we are spending as much as we can usefully spend. There is no purpose in spending more money than you can absorb, and by absorb we generally mean two things: Do you have the men and facilities, and are you at the state of knowledge where you do something sensible with the money.

Mr. SIKES. Because of the apprehensions of what the Russians may be doing in this field, there have been proposals that we should have an overall laser crash program somewhat similar to the one which resulted in the development of the atomic bomb during World War II.

Dr. KOSLOV. Mr. Chairman, in effect we have that now. I think there is a fundamental difference between the early 1940 period that led to the Manhattan District and our present situation. We are a lot more sophisticated in research management. We have a lot more invested, as this committee knows, in research facilities.

We are a lot more coordinated in what we do in terms of Army, Navy, and Air Force, lab A to lab B. The laser question is in effect a triservice program. The Army, Navy, and Air Force are exchanging all of the fundamental and all of the basic engineering knowledge. They are all concerned with the specific mission characteristics. The laser is a complex weapon, a complex weapon both in its interaction with the environment and interaction with the target, and the missions of the three services are not the same. What may turn out to be an adequate weapon for the Navy may not turn out to be an adequate weapon for the Air Force and vice versa.

We are at the stage now where we probably will need some rather costly facilities when we go to sea. There are particular reasons for going to sea in terms of environmental interaction and in terms of

specific type of targets it will interact with. Unlike a gun it makes a difference with the laser whether the laser beam is going in a static way through the atmosphere or flowing through the atmosphere. It makes a tremendous difference as to whether you are operating over water or operating over dry land. We have to know these differences and have to know whether they are compatible with a viable military system and have adequate ability to perform under different conditions.

So there are going to be requests, certainly internally to the services and perhaps to the Congress, for additional funds.

But I don't think that it is a fair evaluation, and I feel this to a certain extent as somewhat of a historian of science, to simply transfer the environment of 30 years ago to the environment of today in terms of a massive development project. I think if we try to go to a Manhattan district kind of operation, all that we would do would be to create a tremendous amount of perturbation, move a lot of people around, and reinvest in facilities we don't have to reinvest in, and we would wind up with a director of the program, who after he has been there 2 weeks, is going to call in the staff and say, "Gentlemen, the first thing we are going to do is form an air division, a sea division, and a land division, and we will go from there."

Mr. SIKES. That is very interesting. Mr. Patten just made an interesting comment.

Mr. PATTEN. On the laser, in your opening statement you said "If we had the power." How much power do you have down there?

Dr. KOSLOV. We have ——— shooting across Chesapeake Bay right now. That is a lot of power in a beam about ——— centimeters across.

Mr. PATTEN. I was thinking in your research of how much power you need. Is the most power you have developed in your research ——— kilowatts?

Dr. KOSLOV. That is an experimental model. We think we can go up to a factor of 10 easily over the next couple of years. We can ——— right now with laser. I wouldn't say we could do it in a military system.

Mr. PATTEN. How far have you used it?

Dr. KOSLOV. We have worked it over about ———.

Captain SAPP. The question is how fast.

Dr. KOSLOV. And whether you can get the energy in the marine environment.

Mr. TALCOTT. Is that what they mean by sluing?

Dr. KOSLOV. If I put a laser beam through the air it heats the air, and when it heats the air it produces effectively a lens effect, and we get a number of phenomena, one of which is called blooming, namely, the beam tends to disperse. We find if we slue, which in fact is what happens aboard a ship or defense environment, something coming at you ———.

Second, the specific frequency of the laser is extremely important in terms of interaction with the air. If you look at the absorption spectrum of the wave length you see how much energy I take out at a specific frequency in the air. The atmosphere is very complex, and the difference between frequency A and frequency B can be a difference of effectiveness of a factor right now, with the ——— versus the ——— laser of maybe ———.

## LASER FACILITY CHESAPEAKE BAY

Captain SAPP. Mr. Chairman, I am the Director of the Naval Research Laboratory and we have our laser facility at Chesapeake Bay, a 45-minute trip from here. We would be very pleased to have any of you come down if you want to see a high-energy laser.

Mr. SIKES. It would be well worthwhile.

Mr. LONG. Is that in Anne Arundel or Calvert County?

Captain SAPP. It is in Calvert County. We would be very pleased to have any of you come down or come over to the laboratory to be further briefed.

Mr. PATTEN. That would be wonderful. I had a friend in Navy research down here along the Potomac River 3 or 4 years ago. They were trying to add more power and get more done. They had fish nets all over. I was glad to get out of there. I thought they had a little bit too much.

## SIZE OF RESEARCH EFFORT

So we get a sense of balance, our investigators also said something which disturbs me. "The present research and development effort of the Navy is only half of that expended 10 years ago." They are quoting the Office of Naval Research that this is due to budget cuts, personnel reductions, and inflation.

Mr. SIKES. Is that true?

Dr. KOSLOV. I think this is an exaggerated estimate, but I think the trend is correct. In the first place it depends on what you mean by research. Are you talking about research as the basic research program, the 6.1 program in our vernacular?

Mr. PATTEN. They are referring to research and development.

Dr. KOSLOV. R. & D. as a whole, no. Basic research, possibly.

## CANCER RESEARCH

Mr. PATTEN. How about if we throw this thought in. In how many hospitals, medical schools, colleges, and private corporations across the land are we doing practically the same cancer research? I know on my HEW subcommittee we just voted \$545 million last week for cancer research.

Mr. SIKES. They are not doing any cancer research are they?

Mr. PATTEN. What I am trying to say is, you have 12 laboratories involved in biochemistry. Six laboratories in bioengineering. You would think that was duplication.

The inference has been left that we could cut down to one laboratory in biochemistry and one biomedical and one in life support. I am giving the exaggerated case of the cancer research because I know they are getting money in thousands of places across the land. We don't have to talk only of Memorial and Mayo, but you can go right across the country, all the prime medical centers. In my colleges, Princeton and Rutgers, they are doing tremendous work in the cancer field.

Let's take it for granted that thousands of places in America will get some Federal funding. Everybody working in the area of cancer is hoping to make an improvement.

That is generally a true statement isn't it?

Dr. KOSLOV. Yes, it is.

Mr. PATTEN. I only throw that in so we get a little perspective, I am under the impression that you are not doing the work that you did 10 years ago.

#### FREQUENCY OF TRANSFER OF MILITARY PERSONNEL

You fellows rotate. How long have you been in your spot, Dr. Lawson?

Dr. LAWSON. I will have been there 5 years on Labor Day.

Mr. PATTEN. One thing bothered me. The report says you are operating by letting a fellow be on a job a year or 2, and then you push him some other place and bring somebody else in.

Dr. KOSLOV. May I address that question?

Mr. PATTEN. Yes.

Dr. KOSLOV. I think the report may be referring to the military rotation question. The research laboratories are primarily civilian.

Mr. SIKES. I, and others on this committee, and on the Defense Committee have been concerned with the frequent transfers of military personnel, specifically military personnel, because of the old concept that a man had to be an expert in all types of military activities. That was before military activities became so very complicated and sophisticated.

In a long conversation with the Secretary and the Under Secretary of Defense earlier this year—and there has been a change in Secretaries—about this very thing, I find there is agreement on the part of top officials in the Pentagon that it is a mistake to transfer military personnel so rapidly just for the sake of getting them familiar with a variety of activities. This is an age of specialization.

Dr. LAWSON. May I speak to that point because it is one very close to my heart.

Mr. SIKES. Yes.

Dr. LAWSON. At the moment I do not feel that I have adequate representation of military people in the laboratories. I have around 330 officers in a total population of nearly 23,000. I would like more officers, but I have a very stable professional civilian base. I count on the officers coming in to bring in new ideas, to bring in the concerns of the uniformed Navy, and I find it to be an excellent couplet in the case of the top management of the laboratories. In the laboratories I am directly responsible for we have put the top military officer and the top civilian in the same box on the organization chart.

Mr. SIKES. Are you getting R. & D. oriented officers?

Dr. LAWSON. Some of the time. I don't always want them.

Mr. SIKES. What is the tour of duty?

Dr. LAWSON. The tour of duty for most of the officers is 3 years. That may go to 4.

Mr. SIKES. Is that long enough?

Dr. LAWSON. Yes, sir.

Mr. TALCOTT. Do they go from one laboratory assignment to another laboratory or from a flying billet to a laboratory?

Dr. LAWSON. On occasion they go from one laboratory to another. I would rather have them go somewhere else and then come back to the laboratory.

At the moment at the Naval Ordnance Laboratory I have an excellent commanding officer. He was previously the executive officer at China Lake. In between he was at sea for 2 years. So he knows something about the R. & D. business, which is good, but he is dripping blue water when he comes in the door and that is just grand.

Mr. SIKES. Mr. Davis.

#### COMPETITION BETWEEN NAVY AND DEFENSE LABORATORIES

Mr. DAVIS. Before we leave this general area, I would like to have you discuss two concepts with us. First, competition within Navy laboratories, and second, competition as between laboratories of the sister services. I can understand that there are areas where you have technical problems that are peculiar to the Navy. But when we get into a general overall field such as human behavior and biology, that would seem to be a defense wide proposition. Where are your guidelines set and how do you set them, first of all with respect to competition within the Navy, and then within the Department of Defense, and then as a corollary concept in-house versus contract work?

Dr. KOSLOV. I guess the best way to answer that question is to briefly outline the DOD technology structure. The principal point for the technology base is the Deputy Director for Research and Advanced Technology of the Office of the Director of Defense Research and Engineering. I happen to be his counterpart in the Navy side, Special Assistant for Science. There are similar counterparts in the Army and Air Force.

The work going on in any technology base area is reviewed, as I mentioned before, through coordinating groups, technology coordinating papers, and area coordinating papers.

Mr. SIKES. Off the record.

[Discussion off the record.]

Mr. TALCOTT. I would like to emphasize what the gentleman from New Jersey has said about the strictures we place upon you people in military research and development, when your civilian counterparts can have literally thousands of places doing duplicative work all over the United States which we consider to be perfectly all right. We have to recognize this is a frugal committee. Some of the other committees are a little bit extravagant in my judgment.

Mr. DAVIS. Will you continue now with your answer, Dr. Koslov.

Dr. KOSLOV. Each of the military services, of course, have an extensive staff operation, in the case of Navy under the Chief of Naval Operations and in turn under the Chief of Material as well, which manages the detailed budgetary applications for the different areas of technology base, 6.1, 6.2 and certain parts of 6.3.

What I am saying is that the interservice area, what is each service doing, is it duplicative or not, and what is even perhaps most important in the long term, are the gaps being properly taken care of, which is of considerable concern, is coordinated through the O.D.R. & E., and the service interactions, to answer the detailed question of which work is bought and paid for.

As I mentioned, I think the Navy's principal attention has been paid to the R.D.T. & E. community, the normal expenditure review. They

have to go to and convince a series of sponsors what they are doing is germane to the mission and is unique in fact and has some possibility of producing a productive result. So any given piece of R. & D. is reviewed through a number of different echelons both in the Navy and OSD.

Additionally to this, in most areas, not all areas necessarily, there are external review committees.

For example, in the case of electronic devices, which is a fairly expensive area, we have the Advisory Group on Electron Devices which consists of individuals both in Government and from industry who look at proposed programs leading to specific electronic devices, the transistors and so on. In the medical area in the Navy, for example, we have an advisory committee of the National Research Council, which, of course, is part of the National Academy of Sciences, which periodically reviews the Navy's work in different areas, the infectious diseases, field surgery area, whatever the appropriate area is, at some time during the year. So by the time a piece of paper is issued, which authorizes someone to proceed in the development of research it has probably been looked at by somewhere between, I would say, 6 and 12 different review authorities.

Now the one exception to this——

Dr. LAWSON. That is a minimum.

#### INDEPENDENT RESEARCH FUNDS

Dr. KOSLOV. That is pretty minimum. The one exception to this is a very small amount of money which Dr. Lawson provides to the laboratory directors for internal research, the internal research and development money in the 6.1 area and 6.2 area, internal exploratory development money, which is discretionary with the laboratory director. And it is not all that discretionary. I think your office looks at it to some extent.

Dr. LAWSON. I look at it after the fact, and even there the individual scientist with an idea has it reviewed at least once before the technical director hears about his idea and his request for money, and more often three or four times internal to the laboratory. The guy has thought of something and he would like \$20,000 to get some equipment to do some work. He has got to convince his immediate boss and the department head and usually some form of advisory council. Each of the technical directors handles his money slightly different but that is the typical chain. If the advisory council agrees it looks like it is useful and unique work, it is presented to the technical director. So it is reviewed by people competent in the field at least a couple of times before the director is offered the opportunity of spending his discretionary money.

For a real program, not the one man-year thing but a real Navy program, there is not only that review internal to the laboratory but a similar review at the systems command level, a similar review by Chief of Navy Material and CNO level, and the ASN (R. & D.) level before it gets into the OMB and congressional level.

Dr. KOSLOV. I think in summary we could say roughly—correct me if I am wrong—about 5 percent of the technology base money is seed money. In effect it is intentionally minimal.

Dr. LAWSON. It is about 3 percent.

Dr. KOSLOV. And the balance is essentially all audited money where in order for the money to be committed it has to go through a review process which involves a fair number of both internal and external review bodies, which vary of course quite considerably depending upon which field it is in and what the hierarchical position is, system development, or something in basic research.

Mr. TALCOTT. Is your peer review of the projects similar to the review in the National Science Foundation and other scientific institutions and universities?

Dr. KOSLOV. In the basic research area, yes.

#### OUTSIDE TEACHING ACTIVITIES

Mr. TALCOTT. Do any of your civilian or military personnel moonlight for private research organizations?

Dr. KOSLOV. Teaching perhaps.

Mr. TALCOTT. There is no restriction on that?

Dr. KOSLOV. There are no real rules restricting it. They can, of course, work in a nonconflict situation for private industry providing it is on their own time and providing there is no possible conflict area. Essentially I would say there are very few people in that position. There are a large number of people who teach.

Dr. LAWSON. I encourage that because the guy who teaches at night school at American University is in contact with a lively academic community.

Mr. TALCOTT. And you find no conflict and no diminution in his efforts?

Dr. LAWSON. Is the Government paying a salary of somebody to do work at the university?

Mr. TALCOTT. Yes.

Dr. LAWSON. No; they are not.

Mr. TALCOTT. And this outside work doesn't diminish the work that is supposed to be done in the service?

Dr. LAWSON. It enhances it.

#### DUPLICATION OF DEFENSE RESEARCH ON HUMAN BEHAVIOR

Mr. DAVIS. Let's go a little further. The next step now is the question of duplication between the Navy and the sister services. I am thinking mainly of the human behavior studies. You seem to have them all over the place, with all branches of the service deeply involved. How do you avoid duplication?

Dr. KOSLOV. Of the total defense budget, I believe the current figure is that 56 percent goes into personnel costs, including retirement costs. I think the amount of money, in total, that is spent on any kind of behavioral or human research is considerably less than 1 percent of the defense budget. The programs are generally quite closely integrated by the process that I mentioned, particularly because of the congressional interest and the public interest in the behavioral area.

Dr. LAWSON. And recruiting interests, and the question of an all volunteer service, motivation and that sort of thing.

Dr. KOSLOV. There is a close linkage between the individuals on the bench level and the management level both, in these areas.

We just recently had a review, for example, on the effectiveness of research in racial problems actually held by the Office of Manpower and Reserve Affairs in OSD which involved all three services. I think we got fairly good marks for that review showing it was a fairly well integrated program.

In general the same point holds true. As I said before, because of the difference in mission, it is necessary for each service to have some service-unique work. There are other areas which are clearly not service unique but in which I think it is fair to say the scientific individuals tend to make a sharing of the work. You very rarely find two people doing the same thing. It is just not productive to do it. There is strong feeling on this problem.

#### IN-HOUSE VERSUS CONTRACT RESEARCH

Mr. DAVIS. In-house versus contract. What are your general guidelines on that?

Dr. LAWSON. We are talking primarily about the exploratory development kind of work, not systems work.

Mr. DAVIS. Yes.

Dr. LAWSON. Statistically, if you look at the way the budget is expended, it is about 50-50. Currently I think about 60 percent of the Navy's exploratory development money is being spent out of house through direct contract. This is probably a reasonably good balance. There are repeated suggestions that 6.2 money should all go to the laboratories and let them contract it out. That has one advantage—the industrial guys then will come to the laboratories and there will be closer technical coupling because this is where they will go for money. On the other hand it has the disadvantage that it turns the laboratories more and more into contracting organizations rather than technical houses. So currently about 60 percent of the money goes from the headquarters element on contract and about 40 percent goes into the laboratories.

Of the 40 percent that goes into the laboratories in turn, and this gets very hard to define because sometimes the laboratory will take a piece of money and go and hire really exploratory development work—at the other end of the scale they are buying pencils and paper, and in between they may be buying assistance on work that they are doing in-house. In other cases, they are really buying external work, but it is an internally generated idea, and the internal guy is doing a lot with the contractor. So it is a gray scale and hard to define.

But perhaps depending on which laboratory, 10 to 20 percent of the 6.2 money that comes to them goes out to support work in industry or in the universities. Usually it is industry.

Dr. KOSLOV. In the 6.1 area, about the same ratio holds true. The 6.1 area consists of something over \$100 million. A large chunk is given to the Naval Research Laboratory, essentially the Navy's corporate basic research laboratory, about \$26 million. Of the remainder, about \$30 million goes to the Systems Command who in turn probably contract out about half, and half in turn goes to the laboratories.

And then the Office of Naval Research runs a contract research program, and without checking the book, I think it runs about \$46 million per year. And that is mostly, but not exclusively, university research. It has a fair amount of industrial and institutional research

but mostly university research. ONR does no research on its own. It is a manager of research. The only work it does on its own is in NRL, a part of ONR.

Mr. DAVIS. Thank you, Mr. Chairman.

Mr. McEWEN. Mr. Chairman.

Mr. PATTEN. Mr. McEwen.

#### RESEARCH AT UNIVERSITIES

Mr. McEWEN. On the subject of university research, Doctor, we have heard a good deal, particularly a few years ago, about changes in policies in our own universities generated by student unrest or however you want to define it. Has this had an adverse effect at all on your contracting out research work?

Dr. KOSLOV. It has had a minimal effect. There has been an effect in that some universities have tended to turn down either classified research or in some cases generally any Department of Defense research. I would say in total this has been a very small effect because those universities that turn down DOD research are very few and far between. It has been a matter more essentially of adjudicating how much classified work. Basically, I would say we are still getting the better people. I think we are getting some of the better people in universities, but there are nondefense agencies now that have attractive programs and have attractive dollars to supply, which was not true 20 years ago. I think we are getting good support from the university community.

I think the university community is in trouble, as is well known, because there isn't as much Government research money around as there was, and as much perhaps as there should be, nationally. But in general I would have to say there has been no major effect. We have lost a few things, but as time has gone on we have replaced them with other people and other universities.

Mr. McEWEN. For instance, Mitre Corp., originally was at MIT, and I believe it relocated over in Virginia.

Dr. KOSLOV. Only in part, sir.

Mr. McEWEN. Is it the defense-related research that has relocated?

Dr. KOSLOV. No. Mitre, which is an Air Force-managed Federal Contract Research Center, is at this point. I believe, com-connected from MIT. The headquarters are still in Burlington, Mass., where it originally started. They have expanded their Washington facility. I believe their Washington facility is most heavily involved in non-defense work. The Burlington facility from which the Navy does buy services, but only in the order of several hundred thousand a year, is primarily Air Force. I believe the Burlington facility in Massachusetts is still virtually completely military.

Mr. McEWEN. You go to these universities, or their research corporations that have spun off, because of the people there?

Dr. KOSLOV. Yes, sir.

Mr. McEWEN. If you are cut off, because of their change of policy, from those people, do those people relocate where they can pursue military research?

Dr. KOSLOV. That is a hard question. There is nothing magic about a university professor versus any other researcher. You are dealing

primarily with individuals, and the individual, in turn, if he is a good researcher, is most interested in what he is researching and not what its end application is. He will tend to go where he has the facilities; and, in the case of doing basic research, one important facility is student assistants. This is what the university is best for—getting the bright young man who will support a research grant. When he needs heavy facilities, that is where the Government laboratories are best.

For example, in the heavy reactor business, in the heavy radar business, in the heavy accelerator business, it is virtually impossible for a university to bear the costs. It has to be done on a national basis. So it is hard to make a real judgment as to whether if there was a complete cutoff you would get a polarization of the research community. I would expect you could find people still going where they could best do the work they were interested in doing.

#### PROBLEMS OF INTERACTION AND OVERCENTRALIZATION

Mr. McEWEN. Mr. Davis directed some questions on the matter of duplication of effort. I would associate myself with his concern on that.

Also, I think we may have a concern not only for the waste there may be in duplication of efforts, but possibly of an even greater loss if none of the duplicated effort is correlated or integrated with something else and is used.

I will try to see if I can phrase the question I have in mind for you to answer.

If we were to say to you gentlemen, "We have just found  $x$  number of dollars and we don't have anything that we need to do with it, we would like to give it to you," how would you employ it? Would you put it into more research?

Let me say parenthetically, I found your answer appealing when you said that a number of people in the same field were pursuing their own lines of inquiry and were not all regimented. Would more of these people give you the greatest results, or more researchers coordinating their research?

I am going back a few years ago. One of our colleagues in the House of Representatives, who is a medical doctor, became quite concerned that there was duplication in the field of medical research, but his greatest concern was the fact that the research was being lost because there was a failure to take any part of the research and hook it up with some other research where if you put the two together you then had the answer.

Dr. KOSLOV. You have just stated why the Navy has a large laboratory system. We hope this is something we are relatively successful in doing.

Mr. McEWEN. In bringing this together?

Dr. KOSLOV. In bring it together and bringing it to the problem.

Mr. McEWEN. To go back to my question, if we had  $x$  number of dollars to give you how you would use it? What would get the greatest result—more independent researchers working in the various laboratories or more people above them reviewing their work and trying to bring it together?

Dr. LAWSON. You just said the wrong word. The last thing the independent researcher, the technical guy needs is more review. But one of the things that I personally think would help the system would be to have a few gadflies.

I have one employee on my staff I use specifically in that role. He goes around and talks to people, not in the sense of a formal review, written report, but he visits them and sees what they are doing. One of his major contributions and that more than recoups the cost of his travel money is just what you mention.

He sees Joe working hard on some problem. A month or two later he sees Harry working hard on another problem, but he certainly could use some of the techniques Joe has just invented. So he says, "Call up Joe at such and such a laboratory and talk to him about it. He has got part of your puzzle."

That sometimes comes out in a formal review process but not terribly often. It happens when there are people who drift through the system, and they generally need an excuse to drift through the system otherwise somebody will say why is that trip necessary. But their real function is to see what work is being done and put people in contact with each other.

Mr. LONG. Will the gentleman yield?

Mr. McEWEN. Yes.

Mr. LONG. The way you answer the question makes it sound as if it is a roughly haphazard process. I suppose the next question Mr. McEwen might ask would be: Then do you need many more gadflies?

Dr. LAWSON. A lot would clutter the system. A few, fine.

Mr. LONG. Then you are leaving it up to chance whether this fellow you are talking about happens to run into Joe and Harry. That is great if they are the two people who need to be cross-fertilized. If he happens to run into Gonzales or Al or somebody else, then this isn't going to work. I know research is a terribly haphazard and wasteful business, but don't we need something that is a little better than this accident of whether your gadflies run into Joe and Harry, who could help each other if they know about each other's work?

Dr. LAWSON. The D.D.R. & E. reviews of that or professional journals provide a systematic method of doing that. It is in the cross field work that interesting and exciting possibilities turn up, and it is almost impossible to predict where they will be.

Mr. LONG. You see, you are in a different role from that which we encounter in most universities or in the intellectual world, because you are in the field of problem solving, or at least that is an important aspect of your work. If you are in the area of problem solving, it seems to me you have to have something a lot more efficient than this haphazard process you have just mentioned. I am a little appalled at the answer you gave to Mr. McEwen's question. I hope you have something a little bit better than that.

Dr. LAWSON. For a specific problem that has been identified there is typically a project manager in CNO and things having to do with this identified project will be taken cognizance of by him and they will be aware of where various pieces are and so will his counterpart in the Materiel Command. So the defined problem, yes. But in the more exploratory areas, the problem often isn't defined.

Mr. McEWEN. Let's say the project manager is working on some sort of guidance system for a torpedo. What comes to his attention, what does he see, everything related to guidance systems for torpedoes?

Dr. LAWSON. He is more apt to be in charge of the torpedo itself, the whole thing.

Mr. McEWEN. Isn't it possible someone working on some other problem may have stumbled onto something that might be the answer if you put them together? How do you make sure you have brought together all of the research that may provide the answer to that problem? Going back to what the chairman was asking some time ago, I think he was directing his question at how do you make sure you pull together all of this research to apply to any problem?

Dr. KOSLOV. I think the question was asked and answered somewhat earlier, the question of how do you review the research program. And you asked the question, if I can put it in perspective, what would you do if you got a sudden bundle of money to improve the situation.

I don't think Dr. Lawson meant to imply the gadfly technique is the only technique necessary.

In another thing which was done, and we are simply getting a sort of additional interaction across disciplinary and review lines—I think we all shook in horror at the thought of putting more money into the management side because right now we probably have an overmanagement situation not only in the Department of Defense but, I think, in industry as well. It is something which has occurred due to the structure of funding, the requirements for contract procurement and so on, which has led to managers, marketers, financial managers and so on until you get down to the one guy doing the work. I think the problem is that we do have good review and we are continuing a process of trying to make the review better. I think anyone you asked in the Department of Defense would answer, get some of the people out from under the people doing the review and give them more direct authority.

Part of the problem is that the only people in Government that can say yes is Congress. Everybody else says either no, or not to do anything. It is hard to make decisions and get them accomplished.

That is part of the process where the program manager fits in, and I think the Government is no different than private industry in this regard. Roughly it is a matrix management system. The project manager or program manager concerns himself with accomplishing the problem, that is, a new torpedo, a new gun fire control.

There is a cross set of lines which are in effect the department heads or the specialized companies, and so on, who supply the technology which he draws on. They are the ones who are conscious of the fact that somebody in a totally different field has come up with an idea that can be used, and they will use it if the system works precisely; it generally does. He feeds in to the program manager—try a laser instead of a searchlight. He says they will work. If they don't we will generally get a new division manager, and if they do, and the program manager doesn't adopt the best subsequently, we will get a new program manager.

Admiral RECTANUS. If I may comment on that, one of our problems is to supply the right enemy information to the laboratory. As a result we have what we call a STILO, scientific and technical intelligence liaison officer, in each of the laboratories. Each STILO knows what his

laboratory is working on. They would know what their requirements are for intelligence. They all work together. Each STILO in each of the laboratories works closely with us in Washington here so we can feed them the material that they need to develop their weapons system.

Possibly that is a tangential one but it is one of the mechanisms that we have in supplying the needed intelligence.

Mr. McEWEN. I take it your answer is really you don't need an awful lot more effort on trying to put together all of the various pieces of research. You feel it is pretty well being brought together to bear on any specific problem.

Dr. KOSLOV. If we had more funds I think it would make some of that effort less intensive in the sense that simply part of the intensity of the man-hours that go into management is a reconciliation of the lack of adequate funds. You have to make decisions. We think we make the right decisions, and obviously we don't always.

If there was more funding it would have to go into someplace where it can accomplish something.

One of the biggest mistakes that has been made in massive funding efforts sometimes is to say if we buckshot the money the work will get done. In fact that isn't true. You can put money where there are people who can absorb it and likewise where there are facilities those people can use, so that any expansion in the dollar value of research has to be a mix of people, different people. Some of them will be managerial, of course, and then, facilities to accommodate those people.

If you are talking about medical research areas, there are many things you can do which involve very minor facilities. If you are talking about the high energy physics area, then the facilities become very expensive indeed. And the ratios, of course, change.

Mr. McEWEN. There has been a comment made by somebody that modern education is a process of specialization whereby one learns more and more about less and less until he is intellectually unbuttoned. A person can, in pursuing something and narrowing down and narrowing down his study, reach a point where he may not see what the applications of it are. I am hoping you have the adequate structure and people to look at all of those narrow pursuits and put them together into what may be a bigger and usable package.

Dr. LAWSON. If I may speak to that particular point, in the major Navy laboratories we do in fact have at several of the laboratories people pursuing specific lines of research, very detailed and very narrow. I can assure you that the cases that I have seen have anywhere from two or three to six or eight systems engineer people essentially waiting outside the door to see if they can—these are applications oriented people just waiting to grab it and run with it. The guy doing the work is constantly being told, "I have got a use for it." And internal to the Navy laboratories I can assure you that you can get quite deep in a very narrow specialty, and if you are still on the payroll it is because there are people who want the results of that research.

Dr. KOSLOV. May I add one comment in line with the whole discussion on duplication? As someone who up until a few years ago at least was a working scientist, nothing frightens me more than the thought we will manage the Nation's scientific capability to the point where there is only one place and one individual who can support an idea,

because I think this goes back to the question of judgment. You have to be able to get an idea, that may have some value, visible in various places, because if you wind up with a czar who controls all of the disciplinary areas he may not happen to like your idea, and he also may happen to be a damn fool when it comes to that particular area of research.

Part of the problem here is a balance, a balance between good financial management and avoidance of duplication and avoidance of waste, plus flexibility, so that people don't always do the same thing.

It is a classic problem in the intelligence field as I think Admiral Rectanus will agree.

One of the problems you have is the highly specialized analyst who always keeps asking the collector about what he already knows. Pretty soon the collector doesn't have time to find out the things, we don't already know about in the first place, which may be critical.

Captain SAPP. May I comment on that. As director of a laboratory, I am an officer who has spent half of his career in the fleet and half in R. & D. I make it a very important part of my job to get around the laboratory and look over the shoulders of people Dr. Lawson was referring to and to look for Navy applications and things of interest to the Navy, and at the same time tell our people of the Navy's requirements so they are aware of them. So I am interacting with our own people, and I am interacting with the other laboratory directors. We have meetings that Dr. Lawson schedules, as well as a number of standing councils and committees that the laboratories or the Navy sponsors. So it is a very interactive group among the uniformed personnel Dr. Lawson was referred to, both intralaboratory and interlaboratory.

Mr. McEWEN. That is all, Mr. Chairman.

#### BIOGRAPHIES OF WITNESSES

Mr. PATTEN. If it is agreeable to members of the committee, at this point we have had the admiral and the captain and Dr. Koslov and Dr. Lawson. It might be appropriate if we had your biographies in the record. I know that you are proud of your backgrounds.

Captain SAPP. We will supply those.

[The information follows:]

#### CAPT. EARLE W. SAPP, USN, DIRECTOR, NAVAL RESEARCH LABORATORY

Captain Sapp was born on October 28, 1925, in Baltimore, Md. He attended Duke University from 1944 to 1947, where he majored in physics while in the Naval Reserve Officers Training Corps. He graduated in March 1947, and was commissioned ensign, USN, at that time. He is a graduate of the Naval War College and has attended several naval schools in the areas of antisubmarine warfare equipment and tactics, combat information center operations, and naval electronics. Captain Sapp also attended special oceanographic courses, and his Navy technical subspecialty is oceanography.

Captain Sapp is a line officer and is qualified to command destroyers. During his naval career, Captain Sapp acquired broad operational and command experience in destroyer-type ships and in fleet staffs. While assigned to the staff of commander, Anti-Submarine Warfare Force, Atlantic, Captain Sapp was awarded the Navy Commendation medal for pioneering many programs which significantly improved the effectiveness of fleet sonars and because of his rare ability to apply the technical disciplines of acoustics and oceanography to ASW. He has commanded the experimental destroyer escort USS *Maloy* (FDE 791)

and the fleet destroyer USS *Eugene A. Greene* (DD 711). His fleet experience includes deployments to both the European and Southeast Asia theaters, as well as experimental antisubmarine warfare operations. While commanding USS *Eugene A. Greene* (DD 711) the ship was awarded the Navy League ASW trophy as the most proficient destroyer in the art of ASW in the Atlantic Fleet. Following *Greene's* Southeast Asia deployment, Captain Sapp was awarded a gold star in lieu of a second Navy Commendation medal, with combat "V," for combat and support operations in that theater.

Captain Sapp's R. & D. experience includes project assignments in fleet evaluation activities, in the Office of Naval Research, and in experimental ships assigned to Navy laboratories and to the Operational Test and Evaluation Force. Prior to assuming the position of Director of the Naval Research Laboratory on June 30, 1970, he was on the staff of the Director of Defense Research and Engineering, where he served as Deputy Assistant Director, Sea Warfare Systems (later renamed Ocean Control). On February 19, 1971, Captain Sapp was presented the Legion of Merit for his exceptionally meritorious service in those posts. Captain Sapp was awarded the 1973 Navy League Rear Adm. W. S. Parsons Award for Scientific and Technical Progress.

He is a fellow of the Acoustical Society of America, and member of the Research Society of America, and the American Society of Naval Engineers.

In addition to the Legion of Merit and Navy Commendation medals, Captain Sapp has received the following campaign/service medals:

American Campaign.

World War II Victory.

World War II Navy Occupation with European Clasp.

Navy Expeditionary Medal.

National Defense Service Medal with Bronze Star for Second Award.

Vietnam Service Medal with Bronze Star.

**MR. LYNWOOD A. COSBY, SUPERINTENDENT, TACTICAL ELECTRONIC WARFARE  
DIVISION, NAVAL RESEARCH LABORATORY**

Mr. L. A. Cosby received his bachelor of science degree in physics from the University of Richmond in 1949 and his master of science degree from VPI in 1951, following which he joined the Countermeasures Branch, Radio Division at the Naval Research Laboratory where he has advanced to his present post as Superintendent of the Tactical Electronic Warfare Division. He has been the recipient of numerous certificates and letters of recognition from the DOD, all branches of the services, Canada and the United Kingdom, and his awards include the Navy's Distinguished Civilian Service Award and the ASNE Gold Medal Award for 1968. His contributions to the NATO Von Karman studies in electronic warfare drew letters of appreciation from the Deputy Director of Defense and the Assistant Secretary of the Navy. He has been a principal contributor to the technology utilized in the defense of our ships and aircraft in Vietnam which have resulted in the saving of many lives in this conflict. Mr. Cosby is a member of the Sigma Pi Sigma (National Physics Honor Society), Pi Mu Epsilon (National Mathematics Honor Society), RESA-NRL and IEEE (senior member). He is a past (chairman) of the Washington Chapter PGED of IEEE. He serves on numerous DOD advisory panels and currently serves as chairman of the ATOWG-EW, which is a CNM Advisory Group in the electronic warfare area.

**DR. JOEL S. LAWSON, JR., DIRECTOR OF NAVY LABORATORIES**

Date of birth: July 3, 1924.

August 1968 to present: Director of Navy Laboratories, competitive appointment, Public Law.

August 1967 to August 1968: Scientific adviser/research and engineering consultant to Commander in Chief, Pacific, Camp Smith, Hawaii, Public Law.

October 1965 to August 1967: Special Assistant for Electronics, Office of the Assistant Secretary of the Navy (R. & D.), Washington, D.C., Public Law.

January 1958 to October 1965: Senior Scientists/Staff, Scientific Engineering Institute, Waltham, Mass.

June 1953 to January 1958: Research associate/associate professor, Control Systems Laboratory, University of Illinois, Urbana.

September 1947 to June 1953: Research assistant, Department of Physics, University of Illinois, Urbana.

June 1956 to September 1960: Intermittent employment as a consultant to various R. & D. panels/groups.

May 1943 to December 1945: U.S. Navy.

*Education.*—1941–47: Williams College, B.A. degree in physics; 1947–49: University of Illinois, M.S. degree in physics; and 1949–53: University of Illinois, Ph. D. degree in physics.

*Recognition and awards.*—1967—Navy Distinguished Civilian Service Award; and 1967–71: (4) Outstanding performance ratings.

#### SAMUEL KOSLOV

As special Assistant for Science since April 1972, Dr. Samuel Koslov serves as the principal staff scientific adviser to the Assistant Secretary of the Navy for Research and Development. In this position, he is responsible for critical assessment and recommendations to the Assistant Secretary on technology base programs of special interest to the Navy: Physical, medical, social, and behavioral. He is responsible for review of related MILCON, laboratories, FCRC's, executive personnel, and advisory committees.

Dr. Koslov joined the Office of the Secretary of Defense in March of 1964 as Deputy Director for Nuclear Test Detection in the Advanced Research Projects Agency and became Director of Advanced Sensors in April 1965. In July 1965, he was appointed Special Assistant to the Director of Defense Research and Engineering for Intelligence and Reconnaissance. From 1967 to April 1972, Dr. Koslov was a member of the Research Council and Corporate Research Staff of the Rand Corp.

Dr. Koslov is a member of the Electromagnetic Radiation Management Advisory Council and other advisory groups. He is a member of Sigma Xi and Phi Beta Kappa. He has been a member of several professional societies, and is the author of numerous technical papers in his area of interest.

Dr. Koslov was born in New York City on January 24, 1927. He was educated in New York public schools and at Columbia University, where he received an A.B. degree in 1948, an M.A. in 1950, and a Ph. D. (in physics) in 1957.

From 1950 to 1954, Dr. Koslov was a research assistant at Columbia University, where his fields of research were inelastic proton scattering and mu mesic atoms. From 1954 to 1956, he was a member of the technical staff of the Bell Telephone Laboratories where he studied electron beam noise in traveling wave tubes. From 1956 to 1957, he was concerned with nuclear reactor engineering at Vitro Engineering Corp.

In 1957, he joined the faculty of Stevens Institute of Technology as assistant professor, and in 1960 became associate professor and assistant head of the physics department. During this period, he was involved in various research programs in plasma physics, including controlled thermonuclear fusion studies, plasma instabilities, and plasma studies of explosives. He also acted as a consultant to Republic Aviation Corp. and Vitro Corp. in reactor safety analysis and nuclear weapons effects.

In 1961, he joined the Vitro Laboratories Division as assistant department head for space sciences and was concerned with various military detection systems and electric arc phenomena. From 1962 to 1964, he was director of physical sciences at Allied Research Associates in Massachusetts where he managed programs in various fields of physical science, including biophysics.

Dr. Koslov enlisted in the U.S. Naval Reserves in 1943 and was discharged in 1946. In August 1948, he was married to the former Elaine Trompeter of Brooklyn, N.Y. They have three children. The family resides at McLean, Va.

Mr. PATTEN. We are in an area, of course, that understandably has been covered over and over again throughout American industry. These conversations have undoubtedly gone on in my chemical industry where we are trying to develop something for private profit.

The oil industry. I don't have to mention the leading oil companies in my district. I meet these people. You haven't said that you also meet the individual who won't go home, who lives this thing 24 hours a day. He feels he has the lead.

I was on a project when I was a kid out of high school. We stayed down there 23 hours because the fellow in charge of the project had

an idea. Nobody thought of quitting. He couldn't care less. Twenty-four hours straight we worked.

They sent me up to New York to the library when I was 17 to dig out some books for new thoughts they had. I mention this because they trusted me to go up to the library and dig up something in metallurgy.

When those men start to move, you just can't contain them. They lived this around the clock.

It is like a good surgeon I know whose family, everything, was out the window. He was a surgeon 24 hours of the day to the exclusion of everything else. You couldn't contain him. Nothing else mattered. He didn't read a newspaper, I think, half the time.

So you must have people who are devoted and are absorbed in their work. We want to paint a true picture of what we have and what we are doing.

Do you know the total bill for research in private industry in this country and how vastly it has grown? It runs into many billions of dollars.

I have the main chemical industries of America. The drug and pharmaceutical industry.

Johnson and Johnson, for instance, did \$100 million worth of business in 1963. This year they did 13 times as much. They did \$1,300 million. I know these fellows. I am proud of the growth of their industry.

I met the doctor who invented streptomycin at Rutgers and that is the microbiology work that saves the lives of millions of people. I am thrilled by the fact I knew the man.

Dr. Staunton of NIH was head of our Rutgers medical school and I get a thrill from the work he is doing in genetics. They have had some great breakthroughs. So maybe we should tell our story better.

Captain SAPP. Let me assure you we have those kind of people in our laboratories as well. I can certainly vouch for that. At my laboratory I see the people that do work 23 hours a day. They are right across from the quarters where I live. I see young scientists who have made instruments that have gone to the Moon and taken data about the Earth, and they work around the clock and have made tremendous achievements.

I can go across the entire laboratory in the same way.

I share your interest and enthusiasm, and I think we must get that message across that we have that kind of dedication in our laboratories.

Mr. PATTEN. The RCA laboratories in my district had the cameras for the first capsules we sent to the Moon. I think six or seven times they got up there we never got any pictures. That crowd was sick. They saw no reason at all why they didn't get pictures. They are in the television business, the picture business. When it was discovered what happened it was not their fault at all. Something else was happening. We were spending millions on this project. Today everybody thrills at the beautiful pictures we get from the Moon. But when they didn't get pictures the first six times their hearts were broken.

I want to thank all of you. I think the members of the committee enjoyed the disclosure. If we get the idea that it takes about 12 layers of bureaucracy which have to review and see it, in order to get a project off the ground, you don't know the impression that makes here.

You wonder if everybody is sitting around thousands of desks with millions of papers.

I think you have been trying to individualize it and give the fellows a little leeway and give them their head and the like. You are trying to tell us that more management and more streamlined organizations aren't always the answer. You never know who is going to come up with that idea.

Collectively you have a job to do.

As Dr. Long said, he learned something this morning. This is certainly beneficial for your whole program.

We will come back at 2.

#### AFTERNOON SESSION

Mr. PATTEN. The committee will come to order.

#### DUPLICATION OF MISSIONS OF LABORATORIES

With regard to the missions of the laboratories according to military problem-oriented areas, are there instances where the Navy is purposely duplicating missions and facilities? Provide that for the record.

[The information follows:]

Over the past 6 years the management structure of Navy laboratories has been streamlined to create centers of excellence to meet the needs of the foreseeable future. In addition to these centers, it was recognized that there would continue to be a need for laboratories which would support technological areas across several types of warfare areas or platforms. In doing so, the needs to purify each laboratory or center area of responsibility was recognized. Consequently, this has been emphasized in a recent assignment of missions and functions to those activities. This assignment of responsibilities was purposely structured to avoid duplication of mission area between laboratories and centers.

In supporting their assigned missions and functions the laboratories require a variety of facilities. Facilities acquired through the military construction appropriation are scrutinized to avoid duplication prior to inclusion in the budget. Wind tunnels and anechoic chambers located at the various laboratories, for example might be construed as having been duplicated; however, the characteristics of these facilities are such that they are essentially individually unique. A more detailed treatment of this subject appears in an earlier insert for the record of July 11, 1973, page 550.

#### LABORATORIES IN ANTISUBMARINE WARFARE RESEARCH

Mr. PATTEN. According to our report, you have nine laboratories involved in antisubmarine warfare projects and eight laboratories working on acoustic detection. Can you tell us at this point which are the major laboratories involved in antisubmarine warfare and acoustic detection and how their missions differ? How are their missions similar?

Dr. LAWSON. The easiest way to keep track of them is to start in one corner of the country and go around. The Newport Lab I discussed this morning is primarily concerned with hull-mounted weapons and sonar equipment and direct fleet support. The Naval Air Development Center in Johnsville (Warminster) is in the airborne ASW business. Their particular fields of expertise are in the sonobuoy business and in the systems design of the patrol aircraft that serve the sonobuoys,

deliver them and process the information from them. The Naval Ordnance Lab at White Oak is, as the name implies, an ordnance facility interested in things that go bang, and this is in their case primarily in torpedoes, and they do supporting work in some of the fire control systems. I don't know whether you would characterize NSRDC as this or not. I would probably have to leave it out.

Carderock involvement is in the design of submarine pressure hulls, which are one of the ASW platforms, and in the silencing submarines and ships, which is a measure that you take to reduce the enemy's capability to attack you because he cannot hear you. The Naval Research Laboratory in Anacostia is primarily in the acoustics end of it, transmission and processing of acoustic signals.

The Naval Weapons Laboratory in Dahlgren is not involved in any direct research and development for ASW per se. They are involved in generating the target lists and coordinates for the fleet ballistic missile boats. That is not really ASW. They do, because of their computer facilities, some war gaming or tactic studies by computer simulation.

Panama City Coastal Systems Laboratory—I would not list as being in the antisubmarine business. They are in the countermeasures evaluation of weapons and in the acoustic warfare business; that is, decoys against torpedoes.

Mr. PATTEN. How about if you prepare an answer for the record?

Dr. LAWSON. All right, sir. There is only one more that is really in the ASW business; that is, NUC, in San Diego, which I mentioned this morning is in the surveillance, lightweight weapons, new sonars, and signal processing business.

[The information follows:]

There are five laboratories involved in antisubmarine warfare and acoustic detection: the Naval Underwater Systems Center, Newport; the Naval Undersea Center, San Diego; the Naval Ordnance Laboratory, White Oak; the Naval Air Development Center, Warminster, and the Naval Research Laboratory, Washington, D.C.

Mr. PATTEN. Do you want to tell us how their missions differ, for the record?

[The information follows:]

The submarine threat has resulted in the development of tactics and technology making possible mixed forces or platforms, each optimally configured to do some part of the ASW job. On the airborne side the Naval Air Development Center is concerned with the design of the acoustics package of the ASW patrol aircraft, the delivered sonobuoy to detect and localize the target, and the processing of data from the sonobuoy. Complementing this effort is the airborne ASW weapon system function performed by the Naval Undersea Center.

On the shipboard side, the Naval Underwater Systems Center's program is primarily in the area of underwater weapon systems and readiness of inservice shipboard underwater systems. The Center's sonar efforts are primarily directed to hull mounted and towed sonar systems. The Naval Undersea Center's Systems is more technology oriented in comparison to the Naval Underwater Systems Center, with emphasis on undersea surveillance and advanced underwater systems.

The Naval Ordnance Laboratory's role in ASW is primarily in ordnance. Its strong base in ordnance technology, both in the area of aeroballistics/aerodynamics and hydroballistics/hydrodynamics provides technological support across several types of warfare or platform areas, primarily in torpedoes.

The Naval Research Laboratory is primarily concerned with the transmission and processing of acoustic signals.

## ENGINEERING BUILDING, NAVAL UNDERWATER SYSTEMS CENTER, NEW LONDON, CONN.

Mr. PATTEN. You are requesting an engineering building at the Naval Underwater Systems Center, New London Laboratory. The justification sheet states: "This laboratory is the principal Navy R.D.T. & E. center for underwater weapons systems." The project is for a \$3,600,000 engineering building for engineering and scientific support for underwater sensor systems. It would be used to build and test working models of components and complete sensor systems. Is there not similar work conducted at any of the other nine laboratories involved in antisubmarine warfare projects?

Dr. LAWSON. Yes, sir. I am not sure that I understand. Would you repeat the question? I am not sure that I can understand it and answer it.

Mr. PATTEN. Is there not similar work conducted elsewhere?

Dr. LAWSON. Similar to what?

Mr. PATTEN. Similar to that to be done in the new building you want for \$3.6 million at New London. Aren't you doing the same work at some of the other nine labs involved in antisubmarine warfare projects?

Captain SAPP. I can speak to some aspects of that in that I am familiar with the New London activities and also assessed their facilities in looking at our requested facilities. We have a request in for an acoustic research facility this year. The New London facility is probably similar in a general way to the facilities of a number of labs in that if you are going to conduct any kind of experiment at sea you need a certain number of facilities which will enable you to put together your instrumentation and get it to sea. The New London facility is unique in that, as Dr. Lawson pointed out the facility will be used to assemble and test sonar systems for ships and submarines. The engineering and test and development of sonar systems to go on these platforms requires extensive checkout facilities before you can make the major investment of putting this on a ship and sending it to sea.

That is an extremely expensive way to carry out your work. That is the unique requirement of their facility, that they need a specific facility for sonar systems. Almost any lab that goes to sea needs some sort of acoustic research facility and so does the Naval Research Lab when, in our case, our efforts are directed toward undersea acoustic research, primarily physics in the sound at sea, as Dr. Lawson indicated.

I might liken the definition of preparing your instrumentation to go to sea in a similar way to preparing to send equipment up to the moon. You cannot wait until you are on the way to check it out. You have to extensively check out equipment before you send it down to the bottom of the ocean and leave it there for days, weeks, months, or a year, as we have done in some cases. You make the investment of sometimes hundreds of thousands or millions of dollars in putting this in a ship and sending it to sea with people. That is an example of two facilities. Perhaps, Dr. Koslov, you would want to discuss it on a broader basis.

Dr. KOSLOV. I might say I was a resident of Union County for 8 years and I know the chemical plants very well. In the chemical plants, as you know, we have to check the ideas you have in a research lab,

and then you have the chemical engineering lab and finally the heavy pilot plant that determines whether or not something is really going to go on line or not. I think we have a related problem. I don't think there are only threefold divisions in any of these processes. A related problem we have to worry about in acoustic research in the Navy is the acoustic environment. That is one lab's specialty. How does the water affect the attenuation of sound? How do particular sea conditions affect it? We worry about the development of particular sensors, namely, things which transduce sound into electrical energy and vice versa. We then have to test the system screwed down to the ship. The New London facility, in particular the requested new building, is to replace a lot of very, very badly antiquated buildings. In effect, a pilot plant operation for the underwater sonars. They worry about the sonars put on the hulls of submarines, destroyers, and so forth, as such. Their mission is somewhat different than any of the other labs involved in the underwater sound business.

Mr. PATTEN. How many of these other labs can or could do similar work?

Dr. LAWSON. My hangup, Mr. Patten, is on the word "similar." The example that comes to mind instantly is the work at Johnsville (Warminster) compared to the work at New London. In Johnsville (Warminster) our specialty is in sonobuoys. The biggest microphone they even think about is something that you could pick up—the size of a baseball or bigger. The people at New London are involved with much bigger radiators and microphones, some of which you could not get into this room, but they are of that size. When you say "similar," yes, they are similar. The people doing the work are skilled in the same lines, but one group of people is building hydrophones small enough to go into an airplane and others are building devices which you measure in tons and bolt on the front of ships.

Captain SAPP. When you want to measure the ocean itself, you need very large facilities and equipment that will not even fit in this room. They get to be tens and hundreds of feet long and have to operate at tens of thousands of feet down in the ocean. You need very unique facilities.

Mr. PATTEN. You might expand on that for the record.  
[The information follows:]

The acoustic work at New London is directed toward the development of large sonar for surface ships and submarines. Only the Naval Undersea Center (NUC) in San Diego has the basic capability to do this kind of work. However, NUC would have to have even more new facilities than that requested for NUSC and the people would have to be transferred or new personnel capabilities would have to be developed before NUC could take on the work.

Mr. PATTEN. Is there a similar facility at the Naval Undersea Center in San Diego? Do you plan to build one there?

Dr. LAWSON. No, sir, there is not.

Mr. PATTEN. Do you plan to build one there?

Dr. LAWSON. If you are asking me do we want to build a building for people to do work in—yes. We are just in the process of completing one at San Diego. It is not devoted to the same kind of work.

Admiral MARSCHALL. The hangup here is the difference between the words "same" and "similar." We are not doing the same work at these labs but we are doing similar work for different facets of the problem. That is the way I read it.

Mr. NICHOLAS. If you went and looked at the buildings themselves, could you tell which type of work could be done in one building and which type could be done in another?

Dr. LAWSON. Generally, yes.

Mr. NICHOLAS. Before the equipment is put in?

Dr. KOSLOV. The presence of overhead cranes.

Mr. NICHOLAS. I am talking about specifically San Diego.

Dr. LAWSON. Generalized laboratory support facilities.

Mr. NICHOLAS. You finished a building at San Diego and you have no present plans to expand?

Dr. LAWSON. No, sir.

Mr. NICHOLAS. Duplicating what you might do in New London with \$3.6 million?

Dr. LAWSON. No, sir.

#### MISSIONS AND FACILITIES OF UNDERSEA AND UNDERWATER CENTERS

Mr. NICHOLAS. In what major ways are the missions and facilities capabilities of the underwater center on the east coast and the undersea center on the west coast different? We discussed this somewhat earlier in our hearings, but I wish you would explain to us now how they are basically different or if they are basically the same. Could you also provide more details on their missions and particularly on their facilities capabilities for the record?

[The information follows:]

The respective missions of the Naval Underwater Systems Center (NUSC), Newport and the Naval Undersea Center (NUC), San Diego are complementary but not duplicative. The mission of the NUSC is essentially centered in underwater weapons systems and related fleet support while the NUC mission is more technology oriented with emphasis on ocean technology, undersea surveillance, marine bioscience, and airborne ASW weapon systems. For purpose of comparison the missions/functions and major facilities of the two activities are provided in the following.

The primary mission of the Naval Undersea Center is to be the principal Navy R.D.T. & E. Center for underseas surveillance, ocean technology, and advanced undersea weapons systems. The NUC maintains in-house research and development capability for:

- Undersea surveillance
- Undersea/surface weapons and fire control systems
- Light-weight torpedoes
- Sonar for high-speed vehicles
- High resolution sonar systems
- Underwater acoustic warfare systems
- Remote-controlled underwater systems and support
- Ocean technology and engineering
- Marine biosciences
- Marine mammal systems
- Underwater acoustic propagation, Pacific and Arctic Oceans
- ASW support for the Pacific Fleet
- Arctic submarine systems

The NUC maintains the following major facilities to support its mission and assigned functions:

- San Clemente Island ocean engineering test range
- Torpedo/missile ballistic range, Morris Dam
- Propulsion laboratory, Morris Dam
- Acoustic torpedo test range, Long Beach Sea Range
- Arctic submarine experimental pool
- Simulation facility hybrid, ASW weapons systems
- Pend Oreille calibration barge

Transducer evaluation center

Marine mammal research facilities

The primary mission of the Naval Underwater Systems Center is to be the principal center for underwater weapon systems. The NUSC maintains in-house research and development capability for :

Sonar systems (hull mounted and towed)

Submarine communications systems integration, including submarine antenna systems

Underwater weapon systems (less mines and strategic systems)

Underwater target systems

Underwater acoustic propagation, Atlantic Ocean and Mediterranean

Underwater range technology

Readiness of in-service shipboard underwater systems

ASW support, Atlantic Fleet

The NUSC maintains the following major facilities to support its mission and assigned functions :

Torpedo test ranges (fixed and portable), shallow and deep water

ASW weapon fire control R. & D. facility

ASW weapon launching device R. & D. facility

Quality engineering, evaluation, and reliability laboratory

Bermuda research facility

Torpedo propulsion test facility

Electromagnetic facility, Fishers Island

System certification and integration facility

Acoustic measurement and transducer research and evaluation facilities,

Lake Seneca, Dodge Pond, and Millstone Quarry

Narragansett Bay torpedo test range

Eleuthera instrumentation shelter

Acoustic range, Fishers Island

Atlantic undersea test and evaluation center

Azores fixed acoustic range facility

Cape Kennedy mark 48 test facility

Mr. NICHOLAS. To what extent is the underwater center involved in the development of acoustic arrays other than those for submarine or other underwater weapons? Is all your work at New London and Newport on submarines?

Dr. KOSLOV. Surface ships, first of all.

Mr. NICHOLAS. There is no work on undersea acoustic arrays done at the present time or planned in the future at New London or Newport?

Admiral MARSCHALL. Arrays?

Mr. NICHOLAS. Yes.

Admiral MARSCHALL. Fixed arrays.

Mr. NICHOLAS. Other than on a ship or a submarine.

Dr. KOSLOV. There is a certain amount of support work done at Bermuda.

Mr. NICHOLAS. That is in place? That is technical support? They are not working on anything new?

Dr. KOSLOV. No. They are building arrays for their own support, measurements. Not for operations.

Dr. LAWSON. They are the U.S. representatives to the multinational representatives national range in the Azores. They did a lot of the engineering for them. They are the U.S. rep to that NATO effort.

Captain SAPP. That is an underwater tracking and experimentation range.

Dr. LAWSON. You could consider it an array.

Mr. NICHOLAS. Why was the underseas surveillance mission transferred to the underseas center in 1972?

Dr. LAWSON. It didn't have a home before that.

Mr. NICHOLAS. Was it transferred from the east coast lab?

Dr. LAWSON. No. In order to provide a focus and a center for that sort of work, we elected to use San Diego. That is one of their immediate functions that they picked up, to provide technical support for the project manager for undersea surveillance.

Mr. NICHOLAS. Could you provide for the record where this type of work was done before it was centralized in San Diego?

[The information follows:]

The Naval Undersea Center (NUC) has been involved in undersea surveillance since its establishment as a laboratory. Increasing emphasis in this area, together with an expansion of the role assigned to the center providing greater latitude in development work, has resulted in an increase in NUC's efforts in undersea surveillance during fiscal year 1973. The center is serving as the principal assisting laboratory to the Naval Electronic Systems Command, Undersea Surveillance Program Office (PME-124). NUC is aiding in the assessment of technical aspects of surveillance programs, evaluating proposals for future work, as well as Navy laboratory/industry resources needed to pursue the R.D.T. & E. program. During fiscal year 1973, NUC assumed, via functional transfer, the surveillance cataloging and analysis capability previously assigned to the Naval Strategic Systems Navigation Facility (NSSNF), Brooklyn, N.Y. This functional transfer represented approximately 5 man-years of work.

Mr. NICHOLAS. To what extent is the undersea center involved in technical direction for Mark 46, ASROC, and the towed acoustic surveillance system?

Dr. LAWSON. The Mark 46 that I am familiar with is the lightweight torpedo, and NUC has been technical director of that project essentially throughout its life and still is on the improvement score.

Mr. NICHOLAS. ASROC and this towed array system are also provided technical support from the west coast. Provide the rest of the answer for the record.

[The information follows:]

The Naval Undersea Center has been involved in carrying out many programs from conceptual stage through fleet introduction and fleet engineering support. Included in these are ASW torpedoes (most recently the MK-46) and ASROC systems. NUC has continuing responsibility for technical direction of the MK-46, providing for a broad range of effort directed toward weapon improvement, production support including proofing, and inservice weapon systems support. Current plans include engineering effort necessary for retrofit of recent improvements in weapon effectiveness in the presence of countermeasures and modification to adapt the torpedo to the helicopter launching system. The future program includes further improvements in anticountermeasure effectiveness. Fleet support includes review and followup of all fleet defect reports, as well as effecting improvements in test equipment. Life cycle maintenance costs have been reduced by half, and torpedo test time has been reduced from 6 hours to 30 to 40 minutes, through the development and operational use of the MK-540 test set.

NUC is the technical direction activity for the ASROC weapon system and has design cognizance for the ASROC missile. NUC is responsible for solving problems resulting from fleet use of ASROC, including testing to determine required system changes and further development. NUC maintains configuration control of the missile. In addition, NUC has the technical direction of the ASW interface with the guided missile launching system MK-26 and the design cognizance of missile modification incidental to system compatibility.

Relative to the towed acoustic surveillance system (TASS), NTC is extending its technical support to the ASW surveillance program for TASS in the Pacific Ocean. Test operations on an installed system are being conducted in the Pacific Ocean to validate engineering improvements and performance prediction models, develop Pacific operational use doctrine, determine system reliability, and maximize system effectiveness in the Pacific. NUC will also provide technical assistance for fleet operations and training.

Dr. LAWSON. They were active in the ASROC program. I imagine they are still providing technical support for that.

Mr. NICHOLAS. Does this conflict in any way with its mission of developing advanced undersea weapons systems?

Dr. LAWSON. I have to return to some of the philosophical discussion we had this morning. Too much of it, yes, it would. I personally think from my own experience in the research world and what I see in the Navy labs that it is good for the health of the laboratories to have some responsibility for things that are in the fleet so they see what the real problems with those devices are and provide them with an opportunity to see other problems that they can take home and work on.

In addition, they are a repository of technical strength, and when problems of that nature come up in a continuing program, rather than the Navy supporting a separate technical group to provide technical direction to ongoing programs, it seems to me much more efficient that we use people who are instrumental in the development and who are developing similar things for the future.

Mr. NICHOLAS. Is it similar to work that other labs are doing and therefore perhaps duplicative?

Dr. LAWSON. Other labs also follow their equipment into the field. They provide continuing support through its deployment life, so it is similar in a philosophical sense. The other labs who are following torpedo or fire control or sonar work into the field, are following generally devices which they have had a major hand in.

#### NAVAL RESEARCH LABORATORY—ACOUSTIC RESEARCH FACILITY

Mr. PATTEN. Can you describe the types of acoustic research you are doing at NRL, for which you are requesting an acoustic research facility in the amount of \$740,000?

Captain SAPP. I would be pleased to respond to that question. I might amplify upon the remarks made concerning the responsibilities of undersea surveillance before we discuss this. I think there may have been a possible misinterpretation on the relationship of the assignment of undersea surveillance to the Naval Undersea Center in San Diego. They are part of the Naval Material Command, and as such they support the program managers in the development and improvement of undersea surveillance systems. The Naval Research Lab, on the other hand, has a mission of conducting basic and applied research on the physics of sound in the sea. It is our job to determine what the ocean will let us do in the various areas of the world, and then having developed this information, the other labs proceed with systems development based on the work in undersea surveillance research that is conducted at the Naval Research Lab.

Our requirements for the facility are one which will enable us to assemble and check out very carefully very extensive instrumentation which we will have to use to measure the characteristics of the ocean, particularly sound in the ocean, in order to determine what it will let us do in terms of detecting submarine-radiated noise and/or putting active signals in the ocean for detecting submarines at long ranges.

The situation can be likened to the example that I gave you a few moments ago where, if you are going to send instrumentation, say, to the moon, you have to check it out very thoroughly. Sending instrumentation to sea, where we put it on the bottom of the ocean and record it over a long period of time, where we have to look into the

time variations of the signals, requires that we have a very specialized facility to check out this equipment; just as thoroughly with the same degree of reliability, sometimes even more so, because it has to operate in an adverse environment on the bottom of the ocean for a great period of time.

We need an essentially clean room facility, on the one hand, to handle precision instrumentation, which we encapsulate. Then we have to have an extensive test facility to run what you might call life cycle testing, to assure this equipment will work, because we invest hundreds of thousands of dollars in this instrumentation and spend millions of dollars a year in ships to get this to sea. We have to be sure it works because we make a major effort to put a major experiment at sea with a number of ships that can often cost millions of dollars. Our problem is to check out this equipment's reliability, much of which, as we indicated, is very large and heavy as well as very sensitive, and make sure this works before we take it to our ships and carry it to sea.

What we propose to do in this facility is to take some temporary facilities that we have, combine them with some warehouse space that we have managed to clear out, make additional room, and provide a facility which will accommodate the new type of instrumentation that our experimental program has developed to determine new methods of submarine detection. Thereby, we will come up with a facility which will not only enable us to get the equipment "wet" on checking it out that way, but also to determine its performance and reliability and feel confident when we go to sea it will work.

Mr. NICHOLAS. How does the type of problem that you are trying to solve through this type of research differ from the types of problems that any of the other labs working in this area are faced with in developing a working system? Aren't they comparable?

Dr. LAWSON. May I take a shot at part of that?

The process of getting new weapons, I tend to break into four pieces which have blurred edges. The first is what are the laws of nature? The second part is knowing the laws of nature, behavior of sound in the sea, for instance, what can you do about it? The third part is, are the things that you can do with it militarily useful? The fourth part is, granted that you can do something militarily useful, can you turn it into a device which industry can produce and sailors can operate and produce the results it is supposed to produce?

The edges are a little fuzzy between those, but the portion that Captain Sapp spoke to is the investigation of what are the laws of nature in the ocean. That is a different kind of study than having discovered that sound does in fact go through the ocean and it will reflect off submarines, can you build a device called a sonar? The answer is yes, you generally can. Then a specific variety of sonar. Is it militarily useful and can you produce one which the country can afford and sailors can operate?

Mr. NICHOLAS. In any one of these labs which is trying to develop an effective sonar system, aren't they thrown back against this question of what are the laws of nature in the ocean? That would seem to be the primary problem. It does not work so what do you do? It is not a question of whether the wires are hooked up?

Dr. LAWSON. The military in going to NRL ask about the laws of nature and tell NRL what things they wish they knew. That is the situation.

Captain SAPP. They do make, if I may add to that, make measurements using the equipment they are operating. They determine very specifically how that equipment performs. They may consult with us. They probably make their own measurements and interpret them because they will be working on hardware systems. We are not a hardware lab in that sense, not a systems hardware lab. Our job, as Dr. Lawson indicated, is to determine what Mother Nature will allow. We are equipped for that. We have two ships dedicated to study of the ocean. One, the *Hayes*, a catamaran oceanographic research ship, is equipped for deep sea anchoring in 20,000 feet of water and to handle heavy loads through a center well. We have a substantial investment in that ship which is dedicated for that purpose. The other research ship, *Mizar*, is uniquely equipped for ocean engineering and bottom search. This is the ship that found the *Scorpion* and *Thresher* and the bomb off of Spain, and so forth. She is uniquely equipped for making very deep sea measurements and observations on bottom conditions as well as general oceanographic measurements. They work together, and we have deployed them to the Arctic and have gone into the ice some 50 miles with the *Mizar*. We need the necessary facilities to support our investment in these ships and the information we must gather with them for ASW programs.

Mr. PATTEN. Is this work on large ocean test equipment consistent with NRL's position as the Navy's advanced research laboratory? Why?

Captain SAPP. Yes, sir, very much. In fact, I think it follows directly from what I have been saying.

#### DUPLICATION OF MISSIONS

Mr. PATTEN. Our staff report indicates that there are 4 Navy laboratories involved in antimissile defense projects and 10 with military intelligence projects, and 12 laboratories involved in electromagnetic and acoustic countermeasures. Again, this seems like an awfully large number to be involved in these areas without unnecessary duplication occurring. Can you discuss the similarities and differences in the work of each of the major laboratories involved in these areas?

#### TECHNICAL INTELLIGENCE

Dr. LAWSON. If I may take the one that jumped out at me as you went through the list, essentially all hardware labs have some kind of military intelligence project. I am very gratified that they do. Those projects do not in general amount to a large dollar volume of work but there we are in fact capitalizing on our own engineering expertise to understand with only limited information available what the other guy is doing and in some cases where we are fortunate enough to have our hands on a piece of foreign equipment, we use our engineers to exploit that equipment as to its probable behavior, characteristics, reliability, and infer from that what capability that device gives to the enemy.

The fact that essentially all of the labs are involved in that process is part of what Admiral Rectanus spoke to this morning when he mentioned the STILO's. We are using our technical resources to support the intelligence mission.

Dr. KOSLOV. The intelligence community is supported in two ways with technical resources. One, in the sense of taking technical expertise and assessing intelligence impact. There is no way of doing that other than this. Technical intelligence, the collection thereof and the analysis, is one specialty. It does not mean much unless it interacts with the R. & D. community that uses it and assesses it in terms of our own progress.

Secondly, the labs supply technical systems for intelligence collection which in a few cases can run into substantial dollars. Within the limits of classification it is difficult to go into details here. The labs are involved in different kinds of intelligence collection. When we talk about intelligence collection we are talking about ——— aircraft underwater systems, and large facilities ashore. We are talking about the traditional martini with its olive wired up.

We are talking about special cameras for agents. We are talking about communications equipment, and in each and every case there is some lab that has a special competence developed in that area of technology. It is not at all surprising to find intelligence-related projects, things which appear in the consolidated intelligence program at different labs.

Mr. PATTEN. Doctor, without commenting on what effect your statement has on me, how about expanding on that for the record?

[The information follows:]

The interface of the technical resources at the Navy laboratories and centers and the intelligence community is a particularly vital linkage for national defense. The basis of a valid and potentially effective development program depends in large part on a near realtime continuity of scientific and technological intelligence. Within the legitimate "need to know," this sensitive material serves to insure that competent technical energy will be exerted to effectively exploit the feasible counters to the known or projected threat. Current and projected intelligence is of vital importance to the laboratories and centers in assurance of the necessary leadtime to decide and initiate effective developments and studies.

Wherever a laboratory core of expertise exists which is specifically adapted to some offensive or countermeasure military function, the expertise also exists to analyze the effect of a potential opponent's technological interests or advances. Additionally, this core can and does serve to assist in advising and recommending the most modern technical approaches to intelligence data gathering in these areas.

#### NAVAL RESEARCH LABORATORY, WASHINGTON, D.C.

Mr. PATTEN. What part does the Naval Research Laboratory play in this area of countermeasures, and how is this basically different from what all of these other labs are doing?

Captain SAPP. Mr. Chairman, I wonder if this might be an appropriate time to make a presentation on the facility that the Naval Research Lab is requesting, and then if there are some questions perhaps Dr. Lawson or Dr. Koslov could comment on how this relates to other labs. We feel that the comments that we have concerning this facility describe a very unique facility. I think it might stand on its own.

Mr. PATTEN. That would be in order. Proceed.

Captain SAPP. If that is agreeable, I would like to read a statement, if I may.

Mr. PATTEN. All right. Give us your briefing now.

[First insert page I-26, I-27, in the record at this point.]

[The information follows:]

1. DATE 17 APR 1973		2. DEPARTMENT NAVY		3. FY 1974 MILITARY CONSTRUCTION PROGRAM			5. INSTALLATION NAVAL RESEARCH LABORATORY						
4. COMMAND OR MANAGEMENT BUREAU OFFICE OF NAVAL RESEARCH				6. INSTALLATION CONTROL NUMBER 3860-930			8. STATE/COUNTRY WASHINGTON, D. C.						
7. STATUS ACTIVE				9. YEAR OF INITIAL OCCUPANCY 1923			9. COUNTY (U.S.) DISTRICT OF COLUMBIA		10. NEAREST CITY WITHIN DISTRICT OF COLUMBIA				
11. MISSION OR MAJOR FUNCTIONS  This Laboratory conducts scientific research and development in the physical sciences and related fields directed toward new and improved materials, equipment, techniques and systems for the Navy, Department of Defense and for other government agencies in defense related efforts.  Major Functions: Conduct basic research to improve material, equipment and techniques				12. PERSONNEL STRENGTH									
				PERMANENT			STUDENTS			SUPPORTED			TOTAL
				OFFICER (1)	ENLISTED (2)	CIVILIAN (3)	OFFICER (4)	ENLISTED (5)	OFFICER (6)	ENLISTED (7)	CIVILIAN (8)	(9)	
				a. AS OF 31 December 72	41	19	3,991	0	0	0	0	0	4,051
b. PLANNED (BUDGET FY1975)	39	25	4,017	0	0	5	3	3	4,092				
13. INVENTORY													
LAND		ACRES (1)		LAND COST (\$000) (2)		IMPROVEMENT (\$000) (3)		TOTAL (\$000) (4)					
a. OWNED		383		304		77,566		77,870					
b. LEASES AND EASEMENTS #		322* - 63#		4* - 11#		4,030* - 0#		4,041					
c. INVENTORY TOTAL (Except land rent) AS OF 30 JUNE 19 72								81,911					
d. AUTHORIZATION NOT YET IN INVENTORY								2,982					
e. AUTHORIZATION REQUESTED IN THIS PROGRAM								5,395					
f. ESTIMATED AUTHORIZATION - NEXT 4 YEARS								14,874					
g. GRAND TOTAL (c + d + e + f)								105,162					
14. SUMMARY OF INSTALLATION PROJECTS													
PROJECT DESIGNATION													
CATEGORY CODE NO. a	PROJECT TITLE b	TENANT COMMAND PRIORITY c	UNIT OF MEASURE d	AUTHORIZATION PROGRAM		FUNDING PROGRAM							
				SCOPE e	ESTIMATED COST (\$000) f	SCOPE g	ESTIMATED COST (\$000) h						
310.26	ACOUSTIC RESEARCH FACILITY	71	SF	46,200	740	46,200	740						
310.34	INTEGRATED ELECTROMAGNETIC TEST & ANALYSIS LABORATORY	1	SF	56,250	4,655	56,250	4,655						
				TOTAL	5,395		5,395						

Naval Research Laboratory, District of Columbia, WA. \$5,395,000.

This laboratory conducts research and development in the physical sciences and related fields directed toward new and improved materials, equipment, techniques, and systems.

The acoustic research facility project will provide laboratory shop and office space for personnel engaged in advancing basic research in underwater surveillance.

The project for an integrated electromagnetic test and analysis laboratory will provide facilities to conduct basic research required to develop and evaluate countermeasures against threat weapons systems such as the antiship cruise missile.

Status of funds:

Cumulative appropriations through fiscal year 1973.....	\$36,374,000
Cumulative obligations, Dec. 31, 1972 (actual).....	27,594,010
Cumulative obligations, June 30, 1973 (estimated).....	27,658,218

DESIGN INFORMATION

Project	Design cost	Percent complete Apr. 1, 1973
Acoustic research facility.....	\$37,405	19
Integrated electromagnetic test and analysis laboratory.....	223,440	1

Mr. DAVIS. Before we get to the Naval Research Lab, in Connecticut this would not normally be an area where you would have air-conditioning. I would assume because it is a lab that the air-conditioning is necessary for the work for the lab?

Admiral MARSCHALL. Very definitely; yes, sir.

Mr. DAVIS. That is all.

Admiral MARSCHALL. Captain Sapp?

Captain SAPP. Thank you.

Mr. Cosby, the division superintendent, will assist me with the Vugraphs as I get to appropriate points in the presentation.

Mr. Cosby, would you stand and be recognized.

BRIEFING ON INTEGRATED ELECTROMAGNETIC TEST AND ANALYSIS  
LABORATORY

Mr. Chairman, I appreciate this opportunity to provide you and members of the committee with a greater insight into the proposed Integrated Electromagnetic Test and Analysis Laboratory project at the Naval Research Laboratory, which is before you in the fiscal year 1974 military construction program. Remarks today in support of this project bear the overall classification of secret, and they are not releasable to foreign nationals.

This proposed facility will enable the Navy to move ahead in the vital area of electronic warfare alternatives for countering the threat to our surface fleet posed by the antiship cruise missile. Development of effective countermeasures for this weapon is one of the top priorities of the Chief of Naval Operations. The Naval Research Laboratory has been assigned the lead role in this and other electronic warfare efforts.

The Soviets have advanced their hardware development for many types of these antiship weapon systems such that after being air, surface, or subsurface launched and attaining low-level, supersonic cruising speed they can home on surface ship targets using \_\_\_\_\_ guidance systems. \_\_\_\_\_.

We expect the antiship missile threat to grow as the Soviets develop increased capabilities for multiple missile launches against entire task forces and as they install improved guidance and homing systems into the ships and submarines of their fleets.

The facility proposed for your approval will support research and development in an area offering great potential as a countermeasure—one that provides significant peace and wartime capabilities and which will complement the “hard kill” approach of our defensive systems embodied in our gun and missile weapons systems.

This facility fosters electronic warfare research and development and will permit us to make the necessary tests and tradeoff studies to develop countermeasures which are both highly reliable and cost effective. Simply stated, the technology we are pursuing will allow highly sophisticated electromagnetic “jamming” and “deception” techniques to be employed by individual ships or entire task forces to divert incoming missiles from their intended course, causing the missiles to miss and impact at a safe distance from the target. These techniques will also materially support and increase the effectiveness of the “hard kill” defense systems.

Countermeasures R. & D. at NRL goes back to World War II when we built up a staff of experts in this field. The NRL EW staff of some 160 people is in being and has made excellent progress to date. Research and development on defensive capability has been heavily based on modeling and computer-assisted simulation in special anechoic chambers—essentially enclosed spaces shielded from outside electromagnetic interference and finished with special wall treatments eliminating echoes and creating the needed environment for controlled testing.

Mr. PATTEN. Would you say you get zero noise?

Captain SAPP. It seems about like that when you get into one of those. It is dead electromagnetically and acoustically. We cannot stand reflections coming from the anechoic wall because this would interfere with the measurements. ———.

We have had considerable success to date ——— using NRL’s computer model and two small chambers. The general approach attacks the fundamentals of new ——— this approach is based on ——— analysis of physical and theoretical constraints imposed by nature on the antiship missile system designer in his choice of system operating parameter. ———.

The Navy now urgently needs access to a much larger chamber in which to do its modeling—we need more horizontal area to properly simulate task force deployments, and more vertical clearance to deploy decoy countermeasures and to accommodate multiple missile attack threats. Moreover, the chamber must be provided with the means for physical and signal security so that the work and the fruits of the work are not compromised.

NRL is moving forward with procurement of such a chamber not elsewhere available to the Navy—to be ready for installation at the time this proposed facility is ready. Essentially the facility will house the large anechoic chamber and associated computer support and secure laboratory spaces. Aside from housing the chamber, the facility will enable NRL to consolidate its people and equipment now spread through four locations plus trailers.

Now I will direct your attention to the charts. Mr. Cosby is on the far end and will point out the details as I read some prepared remarks. First we will have a graphic which will show the present facilities in the upper right-hand corner.

(Graphic showing isometric of two small chambers in use today.)

Theoretical means of countering antishipping missiles have been proven using the smaller existing facilities. More realistic developments require a wider field of view ———.

(Graphic showing overall interior of proposed facility.)

NRL has been developing closed loop engagement simulations and producing results in a number of separate fragmented facilities, which have prevented effective interaction, and simultaneously have created serious security problems.

Mr. PATTEN. The whole building will be over 100 feet long?

Mr. COSBY. Yes, sir. The chamber has to be not only longer but wider. We have only ——— degrees in the present chamber so we cannot put more than one ship in there.

Mr. PATTEN. You are going to ——— degrees?

Mr. COSBY. ———.

Captain SAPP. Would you indicate across the back screen how you intend to array your sensors, so he can see how the task force effect would be simulated. This might be a good time to digress for a moment.

Mr. COSBY. ———.

Mr. PATTEN. How many decoys would you have to scatter?

#### USE OF COUNTERMEASURES IN SOUTHEAST ASIA

Mr. COSBY. We have been doing this job successfully. We used these in Southeast Asia and the question can be answered by the number of attack angles. If you have only one angle, a few decoys can do it. But if you have that broadened, you get a dozen.

Captain SAPP. If I could amplify on that?

Mr. PATTEN. How about your missile ——— miles away?

Captain SAPP. ——— be launched from hundreds of miles away. I think a good example of the kind of thing Mr. Cosby is talking about can be used by expanding upon his comments in Southeast Asia. The aircraft which had to penetrate the very heavily defended areas in Southeast Asia were critically dependent on electronic warfare and countermeasures to force the surface-to-air missiles fired at them to miss. Without that, our aircraft would not have been able to survive. Our loss rate was quite low because of this capability. Similarly on our ships which operated off the coast of Vietnam and attacked coastal targets; they were tracked by coastal radars.

Mr. Cosby's personnel developed special radar-reflecting clouds that could be launched from the ships ———. This is a very real-world operation he conducts and he says in the current intelligence world as well as looking downstream to new capabilities.

Mr. PATTEN. Is this related to throwing chaff into the air, such as metal?

Mr. COSBY. It is exactly that. These are millions of dipoles.

Dr. LAWSON. Short pieces of aluminum foil.

Mr. COSBY. This package costs about \$5. Ten million dipoles for \$5. It is aluminum foil chopped up ———.

Mr. PATTEN. ——— to work in?

Mr. COSBY. We can make this cloud bloom ———. This is the trick, to make it bloom. You do it like a skyrocket.

Captain SAPP. That is a very good question, because our problem is to detect, recognize the threat signal, get a reaction in terms of this chaff cloud ——— so that the missile will get mixed up between the ship and false target and miss the ship. That is why we need an integrated facility which tests out the whole concept and lets us determine which alternative is best before we make a commitment to actual electronic system construction.

Mr. COSBY. In the U.S.S. *New Jersey* when it was deployed, we could defend that ship against a missile in something less than ———. You can see the threat, launch these clouds, have them activated, and then bloom ———. The whole command process would be completed in less than ———.

Sensing the right signals in reacting to the threat is a critical part of the problem.

#### SECURITY OF FACILITY

Captain SAPP. One of the key problems that we have had to face in this area, Mr. Chairman, is that we have been dealing with extremely sensitive information. ——— we are able to conduct experiments and vary our parameters around either side of this information so that we can define the problem within the limits a system designer would have to work.

By having this sensitive intelligence information, we have to provide a high degree of security. In fact, some of the people that work in this building cannot talk to other people who work in the building because of compartmented security and because it is so sensitive. We have to have special intelligence security. We have to have radiation security and we have to have the necessary facilities to support operations and construction.

To continue with the statement: By integrating these efforts, and by adding the proposed chamber whose characteristics are not elsewhere available, a much more comprehensive interactive approach to the assessment of EW effectiveness can be achieved. Both the evolving interactive techniques and their applications to specific threats on a task force basis dictate the need for the larger radiation-free structure shown in the diagram. To permit continuance of NRL's efforts ——— either in R. & D. or to support the fleet, the proposed integrated laboratory facility includes: a number of appropriately compartmented areas, required for restricted access programs and means for controlling access within those portions in cases where multilevels of security clearances are demanded; secure areas for the ——— a shop for ——— hardware; areas for development of ESM/ECM techniques and systems, with space for modern analysis and synthesis equipment.

#### EXISTING FACILITIES

There are no structures existing at NRL capable of modification to meet the requirements of space and physical security. Remote location would hamper the overall work of NRL. Security is a major consideration and NRL possesses the necessary physical security organization and equipment capability. A comprehensive, nationwide survey of rf anechoic chambers (November 1972 subpanel report to the Joint

Logistic Commander's Panel of Consolidation of Functions and Facilities) discloses that two large chambers exist but their dimensions do not provide the increased field of view required by NRL.

Mr. NICHOLAS. Tell us now what the actual dimensions of those chambers are.

Captain SAPP. We can provide that for the record.

[The information follows:]

The rectangular chamber located at Naval Missile Center, Point Mugu, Calif., is on the inside, 100 feet long and 40 feet in both width and height, giving a 22° field of view in both horizontal and vertical planes. That facility has high rates of usage, providing measured data ———.

The Grumman chamber has a length and width of 75 feet and a height of 30 feet (interior dimensions) with fields of view of 54° and 22° respectively in the horizontal and vertical planes. It is instrumented and capable of emission testing complete aircraft of the EA6B and F-14 types. Schedules exist for extended tests of the F-14 in specific scenarios. Neither of these chambers are dimensionally adequate nor possess the required physical and radiation security demanded nor the complex instrumentation necessary to conduct dynamic engagement modeling as proposed in the much larger chamber described here.

Captain SAPP. One of these chambers is located at NMC, Point Mugu, Calif.; the other at Calverton, N. Y., is operated for the Navy by Grumman to test systems in completed aircraft. Both of these are fully committed, being devoted to their own specific scheduled programs. Neither of these facilities has available the necessary trained and knowledgeable personnel, specialized equipments nor adequate security features to make practical their use for the purposes being proposed.

#### DESIGN OF NEW FACILITY

##### *Graphic showing details of chamber*

The theoretical approaches proven at NRL require the installation of all the necessary facilities in close physical proximity to permit simulating all pertinent details of the problem and with a built-in capability to assess the overall effectiveness of countermeasures. It is essential that the many important facets of a complex operational situation be investigated fully reserving for costly fleet evaluation and exercises only those measures that have been shown by simulation most likely to be effective. The simulation facilities must reproduce the effects introduced by enemy weapons, in all their variety and modes of performance. [Deleted.]

Mr. COSBY. We are proposing a 3-story building of about 50,000 square feet gross area. The first floor contains a compartmented area and a small noncompartmented area to handle administrative matters. Three separate compartments are shown. On the second floor, and another on the first floor to isolate specific detailed investigations within the building. Except for this administrative corridor, and utility space on the third floor, the building will be constructed to provide security appropriate to the equipment and problems being investigated.

This chamber is so large it occupies all three stories at the rear of the building. The third floor only occurs in the front portion.

This high bay area extends over the rear section. Within these forward compartments are all the resources necessary to fully document the ———. We have shops and graphics and printed circuit capability and electronic wiring and so on. In addition, we have a handling area for large objects. Some of these ———. This is an open area in the

rear. That covers generally what is here. There is a little space for housing. We are going to put some 47 people working on this program right now into this facility. We have them scattered about. It is not a case of 47 additional people but 47 people already working on the problem.

Mr. PATTEN. When you said housing, what did you mean?

Mr. COSBY. They live there 8 hours a day. We must accommodate their occupancy with the usual amenities and facilities. They directly support the facility; this is not a general purpose laboratory and office space.

Captain SAPP. In summary, gentlemen, I would like to make the following points:

First: The Navy needs this facility as soon as possible if we are to keep our countermeasures abreast of the rapidly advancing Soviet technology.

Second: The construction of this facility will not create an influx of people but will provide the people now at NRL with a new capability. There is no existing capability adequate to do this job in the country.

Third: The Naval Research Laboratory is the Navy's "Corporate Laboratory" and conducts broadly based multidisciplinary programs of scientific research and advanced technological development. This fact offers a great advantage for placing the proposed facility at NRL since the laboratory's tactical electronic warfare division can and does draw freely on the other scientific and technical disciplines available at NRL. The laboratory also enjoys the advantage of being located in close proximity to the Office of the Chief of Naval Operations, to Headquarters of the various Naval Systems Commands and to the Naval Intelligence Support Center (NISC). Close liaison with NISC allows NRL to rapidly utilize new intelligence material and to provide timely results of specific investigations. By authorizing this facility, you will enable NRL to keep our Navy preeminent in the field of electronic warfare and to meet the challenge of the antishipping missile threat to our fleet.

Thank you for the opportunity of making the presentation, sir. [The charts were furnished for the Committee files.]

Mr. PATTEN. Are there any questions, Mr. Davis?

Mr. DAVIS. No questions.

#### ELECTRONIC WARFARE MISSION OF NRL

Mr. PATTEN. You state that the Navy Research Laboratory has the lead role in the electronic warfare field. Do you mean that it has the lead role in advanced research in this area, or does it have the lead role at all stages—from advanced research right through to technical support?

Captain SAPP. In this particular area we are lead across the entire area you identified. While we do work closely with a number of other laboratories in this area, the laboratory in World War II had a very unique capability in electronic warfare and a group was established and has become essentially pre-eminent, so we have been designated the lead laboratory for electronic warfare. This covers the area from exploratory development to fleet support.

As Mr. Cosby indicated, we have directly supported forces in southeast area as well as working directly with the intelligence community.

PERCENTAGE OF EFFORT DEVOTED TO BASIC RESEARCH

Mr. PATTEN. Am I right to assume NRL is a basic research laboratory?

Captain SAPP. That is our primary mission. Our efforts are divided approximately one-third in basic research, one-third in exploratory development, and one-third in the more advanced areas.

Mr. PATTEN. Provide more exact details for the record on the percentage of NRL's workload spent on basic research; on exploratory development, and improvement or technical support of existing hardware.

Captain SAPP. Yes, sir.

[The information follows:]

The laboratory's research department applies 33 percent of their manpower on basic research (category 6.1); 31 percent on exploratory development (category 6.2); and 32 percent on advanced/engineering/operational development and management support (categories 6.3, 6.4, 6.5, 6.6) and 4 percent in miscellaneous other support functions.

EXTENT TO WHICH NRL DUPLICATES OTHER LABORATORIES

Mr. PATTEN. To the extent that NRL is involved in these other areas, is it not duplicating functions carried on by other Navy laboratories?

Captain SAPP. I believe we touched in depth on that subject this morning. I would be glad to elaborate further unless Dr. Lawson wants to comment.

Dr. LAWSON. Mr. Chairman, you are referring particularly to electronic warfare?

Mr. PATTEN. Across the board on NRL.

Captain SAPP. I would be glad to speak to NRL. I thought that was a broad issue on all laboratories.

Mr. PATTEN. The question relates to the extent that it gets into technical support or exploratory development and the improving of existing hardware and things that are farther downstream than basic research. Is there duplication with the other laboratories?

Captain SAPP. I would not at all call our effort duplicative with the other laboratories. I think it is important to understand the concept of the Naval Research Laboratory. Being a multidisciplinary laboratory, we address almost all areas of science and technology of interest to the Navy with exceptions in the areas of weapons and medicine. Those are not ours. But in the terms of the physical sciences and materials areas, the laboratory has its primary mission.

When you conduct an extensive research program in this area you obviously have many things which you learn and want to apply either in exploratory development, or once you have established that a particular fact in science or nature will allow us to exploit a particular capability, that we want to put together something that will let us demonstrate its application to the Navy.

Furthermore, there are certain systems which evolve from our programs which are better carried on by the people who actually participated in the initial development or are using advanced tools which

would come under the category of advanced development, in order to conduct experiments to prove the feasibility of a particular approach.

Furthermore, by having facilities which have this capability we enhance the opportunity and capability of the scientist working in basic research and exploratory development to have modern instrumentation and people with the understanding of the application of this instrumentation to military systems. Therefore there is a very natural progression of work from basic research through exploratory development to advanced development. But as a general rule, when requirements reach the advanced development stage they are in general picked up either by the systems command or the work is carried on at other laboratories as they get into hardware engineering.

Dr. LAWSON. The other side of that coin is that the 10 big CNM laboratories do a very small amount of research and that is at least partially intentional on my part. They do more work in the exploratory development arena and contract more work in the advanced and engineering development arena. So there is a blending of NRL as a research-oriented organization with less and less involvement as you get nearer the fleet and the CNM laboratories which are only really very minimally involved in research and more and more involved with either fleet hardware or hardware that is being developed for fleet use.

Mr. PATTEN. To the extent that NRL develops its facilities to support work in other-than-basic research, is it not in danger of duplicating facilities already in existence at other laboratories?

Dr. LAWSON. We watch it pretty closely. Facilities money is hard enough to come by so that the Chief of Naval Research and Captain Sapp and I and my people look very closely at requests for facilities money. If there is a facility available that will do the job and it isn't absolutely impossible to get to, we urge that the work go there.

#### ELECTRONIC WARFARE

Mr. PATTEN. What number of NRL personnel are involved in the electronic warfare area?

Captain SAPP. There are approximately 160 personnel in the electronic warfare area.

Mr. PATTEN. Is this the largest group of personnel working in this research area at any Navy activity?

Dr. LAWSON. Yes.

Mr. PATTEN. Supply details on the numbers of personnel involved in electronic warfare at other Navy labs.

Captain SAPP. We can supply it for the record.

[The information follows:]

	EW projects total man- years (1973)	
Naval Air Development Center, Warminster, Pa. ....	33.6	34
Naval Electronics Laboratory Center, San Diego, Calif. ....	63.2	63
Naval Missile Center, Point Mugu, Calif. ....	98.5	98
Naval Ordnance Laboratory, White Oak, Md. ....	4.2	4
Naval Research Laboratory, Washington, D.C. ....	151.0	151
Naval Undersea System Center, Newport, R.I. ....	16.8	17
Naval Weapons Center, China Lake, Calif. ....		138
Naval Weapons Laboratory, Dahlgren, Va. ....	81.6	82

<sup>1</sup> Does not include 87 personnel devoted to operation of Echo Range.

Mr. PATTEN. Why is it necessary to have as large a chamber as you are proposing in order to properly carry out this electronics warfare research?

Captain SAPP. I would like to have Mr. Cosby answer that question.

Mr. COSBY. Mr. Chairman, I didn't explain to you the length of 100 feet. I did explain the angle.

The minimum length here is to get out of the so-called near field. Each of the seekers that are used on these weapons which we are simulating has a means of collimating energy so it can focus on a particular target in this scenario, either electromagnetically or optically. It turns out there is another law of physics to be concerned with, the so-called near field. As a source radiates from a point it radiates in circular waves, if you remember your basic physics, and you are in the near field when the system you are looking at sees a curvature of the wave front as the field reaches a target. You are in the far field when the system receives a plane wave. For the system to represent real world situations as the seeker would see a target at 10 nautical miles or 100 nautical miles, this wave front has to be nearly plane when it reaches the target simulated here.

It turns out that as the function of the aperture used here and for the kind of system ——— these are like 3 feet in diameter at the microwave frequency range. That being the case, the near field has to be in excess of 90 feet. We have chosen 100 feet because we have to put the source inside the chamber. So the distance between the source and the point of impact, so to speak, or target complex, is right on the very minimum. We don't have any extra space in this particular chamber.

The reason we have chosen such a minimal chamber size is because of the cost. Every time we increase this footage we have to add that much more structure to house this facility. We have been trying to hold the cost of the total facility down.

So the dimensions here are 100 feet by about 150 feet across the rear wall. If we took a straight line across this curved rear wall it is about 150 feet. The reason we need that size then is to give an angular field of view and the far field conditions for the apertures that are being used.

Mr. NICHOLAS. You are actually using something that is what you constructed ———.

Mr. COSBY. You can't scale down that problem because of the collimation. You have to use the full scale.

Mr. PATTEN. What is the cost of the equipment to be installed in the facility?

Mr. COSBY. The facilities that will be available in these other chambers I have talked about, the seekers, the electromagnetic systems to drive these sources, and special purpose computers that will be in hand when this facility is completed, if we get it in a year, will be about \$7 million.

This system allows growth. You see we can add more than this number of target elements. We have in mind putting in up to a ——— target elements. Starting where we are, we are talking about \$7 million of present facilities, and we are talking about that growing in 5 years to about \$12.5 million.

I have a breakdown if you are interested.

Mr. PATTEN. I think you ought to provide for the record the detailed procurement and delivery schedules for this equipment.

Mr. COSBY. Yes.

[The information follows:]

	<u>\$ MILLIONS</u>				
	<u>AVAILABLE AT PRESENT</u>	<u>DELIVERY BY END FY 74</u>	<u>TOTALS BY END FY 74</u>	<u>BY END FY 76</u>	
<u>RF Simulation Facility</u>					
Anechoic Chamber	0.2 <sup>1</sup>	0.4 <sup>2</sup>	0.6	2.0	
Controls, Instrumentation	0.4	0.1	0.5	0.4	
Operation & Maintenance				<u>0.5</u>	
					2.9 <sup>3</sup>
<u>Computer</u>	1.0	0.6	1.6	0.3	
Operation & Maintenance				<u>0.3</u>	
					0.6 <sup>4</sup>
<u>Hybrid Lab</u>					
Components & Instrumentation	1.6	0.4	2.0	0.8	
Operation & Maintenance				<u>0.2</u>	
Other Simulation Equipment	0.6	0.4	1.0	<u>1.0</u>	1.0
General Purpose Equipment	<u>1.4</u>	<u>-</u>	<u>1.4</u>	<u>-</u>	1.0
\$ Millions	5.2	1.9	7.1		5.5
Funds from 10 Sponsored Projects (Includes funds for personnel as well as equipment procurement)					5.0 <sup>5</sup>

<sup>1</sup>Design contract

<sup>2</sup>Source module prototype

<sup>3</sup>Chamber construction operation maintenance

<sup>4</sup>Integrated system growth

<sup>5</sup>Estimated for FY 75 & FY 76

Mr. PATTEN. What percentage of this facility will be devoted to the following functions: Administrative space, laboratory space, an-echoic chamber, and associated support space, computer space, and others? Provide that for the record.

[The information follows:]

The following building features have been found in the preliminary design plans:

	<i>Percent</i>
Chamber and high bay area.....	44
Scientific and engineering spaces.....	34
Computer space.....	5
Administrative and conference areas.....	5
Shops and secure storage.....	12
Total .....	100

NAVAL ELECTRONICS LABORATORY CENTER—ELECTRONICS DEVELOPMENT  
AND LABORATORY

Mr. PATTEN. I note that you are requesting the first increment of an electronics development and test laboratory at the Naval Electronics Laboratory Center (NELC). What is the mission of this activity?

Dr. LAWSON. That is considerably different, sir. The problem that the NRL people have spoken to is the understanding of threat missiles to the fleet and counters to those threats.

The functions that will be performed in the building at the Naval Electronics Laboratory Center have to do with the integration of the electronics equipment, the command support equipment aboard one of our vessels, to help attack the problems they alluded to in the shortness of time we have available in a military world to respond.

Admiral MARSCHALL. That is basically a command and control function you are talking about.

Dr. LAWSON. There we are talking about integrating the radars and the computers, the fire control systems, all of the equipment that is on our ship which supports the commander, gets him the information, processes it for him, makes it available for him to make a decision and that he uses to execute those decisions.

Mr. PATTEN. How about after the first 5 minutes and your first defense is over. Suppose it is repeated?

Dr. LAWSON. You have to be able to take on the second one, too, sir.

Mr. PATTEN. Would you be in business?

Captain SAPP. Yes, sir. That is one of the advantages of electronic warfare. We can keep shooting electrons and chaff clouds easier than you can shoot weapons before you run out of them, if you had too many engagements. They complement each other, the weapons and the electrons.

ELECTRONICS RESEARCH

Mr. PATTEN. How many other Navy laboratories are doing work in the electronics area?

Dr. LAWSON. All of our products have electrons, sir.

Mr. PATTEN. What are the principal ones?

Dr. LAWSON. Electronics is a tool one uses to implement certain functions. So we have electronic engineers building guidance systems

for torpedoes, or for missiles, or for ships, or for airplanes. They are all electronics people; they are all building guidance systems. So you could call it electronics work. But it would be misleading to say that it was duplicative. Electrons are the tools you use to do something with.

Mr. PATTEN. Which are the principal centers?

Dr. LAWSON. There are essentially four that jump to mind. The Naval Research Laboratory, particularly in the electronics warfare and high power electron device business. The Naval Electronics Laboratory Center, which is really doing two things. It is doing the command support, the command control and communications business for the Navy, which is largely electronic, and it also does electronics technology work—how can one use the engineering science of electronics to do new things with. And it serves in that sense as a technical support for the Systems Command when they are presented with the proposal so they can ask these people will that electronic device do what the inventor claims it will. They are doing that.

Johnsville (NADC Warminister) has a fair amount of electronics, but it is airplane electronics, airplane-oriented radios, radars.

And the laboratory at Newport, because of their leaning on submarines so much, they are actually working in some of the problems of integrating the radio room, the antenna system for a submarine. That is specific for submarines where the antennas are a real problem because if you want to stick it out through the hull it is apt to leak, and so it is a very tight-knit organization within the submarine community.

Mr. PATTEN. Are you planning to consolidate further at NELC?

Dr. LAWSON. Not in any significant way.

#### POSSIBILITY OF CONSOLIDATING ELECTRONICS AND ELECTRONIC WARFARE RESEARCH

Mr. PATTEN. Why would not electronic warfare be a logical mission for NELC rather than NRL?

Captain SAPP. Electronic warfare requires a dedicated team experienced in many disciplines—electronics, in both systems and components areas; close coupling to intelligence resources and ready access to experts in all the physical sciences and unique physical facilities. At the Naval Research Laboratory, there is such a unique combination of experts in all the physical sciences, a strong radar and communications research effort, a large body of expertise built up over the years in the weapon system vulnerability area and already a large investment in special facilities. In addition, the proximity of NRL to all the intelligence resources available to the Navy, and its proximity to CNO and CNM management allows the dynamic and interactive processes essential to effective electronic warfare research and development. There is no way possible to duplicate this dynamic interaction with technology, the frontiers of science, intelligence, and operational Navy management matters at any other location where these resources do not exist. Thus, over the years, this unique electronic warfare capability for the Navy has evolved at NRL unique physical and personnel investments cannot be transferred nor could they be duplicated at any other Navy facility.