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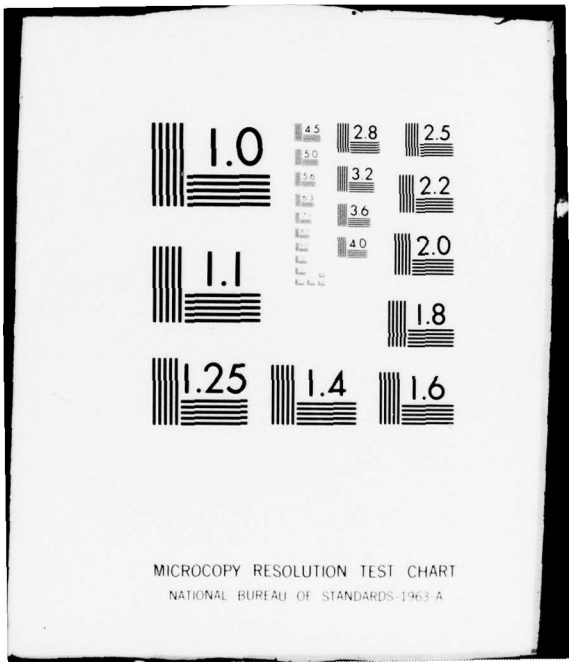
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NAVAL POSTGRADUATE SCHOOL

Monterey, California

THESIS

COST-BENEFIT ANALYSIS OF
TRAINING A NAVAL RESERVE SEABEE

by

Radney Lee Fisher

December 1978

Thesis Advisor: L. Darbyshire

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) (6) Cost-Benefit Analysis of Training a Naval Reserve Seabee,		5. TYPE OF REPORT & PERIOD COVERED (9) Master's Thesis;
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) (10) Radney Lee Fisher		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS Naval Postgraduate School Monterey, California 93940		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS Naval Postgraduate School Monterey, California 93940		12. REPORT DATE (11) December 1978 13. NUMBER OF PAGES 56
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)		15. SECURITY CLASS. (of this report) Unclassified 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited.

(12) 57 p.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Cost-Benefit Analysis
Naval Reserve Seabee
Seabee Training

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

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(20. ABSTRACT Continued)

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Cost-Benefit Analysis of Training a Naval Reserve Seabee

by

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Submitted in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT

from the

NAVAL POSTGRADUATE SCHOOL

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ABSTRACT

The defense of the United States today is based on the Total Force concept — including a combination of active duty and reserve forces in being which provide for the security structure essential during national crisis. However, the Naval Reserve forces have been continually attacked and reduced in size over the past ten years. Is this continual reduction totally justified? An analysis of the costs to maintain a Reserve Seabee relative to an active duty counterpart suggests that it costs seven times more to pay, train and support the latter. While trained to meet specialization and conditional requirements, the Reserve Seabee benefits both civic and other military organizations with contributed labor, completing many construction projects during the year. The positive benefits at lower cost make the Reserve Seabee an asset to our country's Total Force.

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I. INTRODUCTION

A. BACKGROUND

From the very beginning of United States Naval history, Naval Reservists have played an important part in the success of the United States Navy. During the Revolution, there was no regular Navy, of course so that everyone was in effect a reservist. Thus began a tradition which has seen the Naval Reserve augment and support the regular Navy forces in every major conflict throughout our history up to the present time. The Naval Reserve has served to prevent conflict as well. Carl Vinson, then House Armed Services Committee Chairman, had much praise for the Reserves ordered to active duty as a result of the Berlin crisis and pointed out that they had been mobilized "to prevent war – not to fight a war. They were called to meet the crisis and it is to their everlasting credit that they met that crisis head-on."[1] Naval Reservists continue to figure prominently in our country's overall defense posture and strategy.

Nonetheless, the Naval Reserve has found itself being continually attacked in recent years. The fiscal year 1973 defense funding included money for 129,000 Reserve pay billets, but successive cuts reduced that number to 96,500 for fiscal

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[1]Strivers, R.E., Privateers and Volunteers, Naval Institute Press, Annapolis, 1975.

year 1977. The fiscal year 1979 budget request submitted to Congress by the Carter Administration contained funding for only 52,000 billets. It is likely that Congress will compromise, authorizing final totals somewhat higher than those requested, but probably lower than the fiscal year 1978 level of 87,000 pay billets.

At least part of these cuts can be attributed to a continuation of previous Navy and Defense Department budgetary neglect of the Naval Reserve. In a speech at a Reserve Supply Corps seminar several years ago, Vice Admiral Pierre Charbonnet, Jr., then the Chief of Naval Reserve, conceded that "There was a form of, if you will, 'benign obscurity' that engulfed our reserve. It was on the backburner of Navy planning. And although recognized and appreciated, it was never to be considered a full partner in the allocation of money, hardware, construction, or management resources."[2] Another substantial portion of these cuts can be attributed to an overall reduction in the prosperity of the regular Navy. As inflation and an increased demand for the federal dollar in other areas have forced a more austere environment on the Navy, so too has the Naval Reserve experienced a gloomy monetary atmosphere. It has always been a natural phenomenon for even larger cuts to be made in the second-echelon levels

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[2]Hessman, James, "Background for the Future of the Naval Reserve," U.S. Naval Institute Proceedings, May 1978.

which are less vulnerable than the main defense budget. Thus, those looking for budget reduction opportunities believe and advocate that the United States is spending too much on its Reserve Forces. No perceptible consideration seems to be given to the benefits accruing from the dollars expended on the Naval Reserve especially in comparing cost benefits of other programs developed for national security reasons.

B. PURPOSE AND APPROACH

It is the purpose of this paper to analyze in detail the cost to train a Naval Reservist for duty with a Seebee Company ... and hopefully to examine some of the benefits related to this investment in training and military reserve activity. Owing to the variety and complexity of the Naval Reserve components (air, surface, supply, etc.,), and due to academic time constriants, it was deemed necessary to restrict the study area to one example. The Naval Reserve Seabee has been chosen as the subject of this paper, both because of certain unique features of his training and because the Reserve Seabees have a unique command structure outside the Reserve Readiness Command setup.

Chapter two gives a brief history of the United States Naval Reserve with an emphasis on the Reserve Seabees. Particular attention is given to the total force concept now applied to the Naval Reserve and the impact it has had on the organization and its operation. The Reserve Seabee organization

and command structure is explained in preparation for the detailed discussions which follow.

The approach used in the cost studies of chapter three is to analyze all costs of training and maintaining a Reserve Seabee. Included are pay and allowances, week-end and readiness duty (two-week) training and the costs to support a Seabee through established Naval Reserve Centers and Permanent Drill Sites. The emphasis then shifts to a close look at the same costs required to keep a regular Seabee on active duty. Chapter four rounds out the study by considering a number of intangible factors including the benefit of having a unit in a high degree of readiness in case of conflict and the community benefits realized as by-products of Seabee training. Also considered are benefits accruing to the Navy from a Seabee's background in the civilian construction industry. Chapter five summarizes the major points of the study.

II. HISTORY AND STRUCTURE OF THE NAVAL RESERVE

A. NAVAL RESERVE BEGINNINGS

The history of the United States Naval Reserve has run parallel to that of the regular Navy itself and has been interwoven with one overriding fact – that in time of war, the Navy has been augmented and reinforced by men who were already trained for land, air and sea assignments. The first United States Navy formed during the revolution was composed entirely of reservists. However, after the first regular Navy was formed during John Adams' presidency, the Navy was able to get along adequately with its regulars, those men who were career-minded professionals. This tendency to rely on its own resources may have stemmed less from the Navy's need for manpower than from the horrible prospect of dealing with the militia of the day. These nonvoluntary militia units had been a disaster and an embarrassment to the Army and the Navy wanted no part of them. However, independent though it wished to be, the Navy had only limited success in filling its ranks through its recruiting. When Congress authorized an increase in Navy manpower from 7500 men to 10,000 men for the Mexican War, the Navy was never able to recruit more than 8,000 men at any one time. This problem seems to have been the result both of poor Navy personnel policies and the widely held notion of the day that the glamour and glory of war belonged to the soldier. Not much

thought was given to the Navy's role in the War and the Navy did not effectively speak for itself.

At the outbreak of the Civil War in 1861, there were about 1,400 Navy officers, about 300 of whom resigned immediately to join the Confederate Forces. Lacking manpower and faced with dim prospects of recruiting regulars, the Navy had to rely heavily on volunteers — Reserves, if you will — to fill its ranks. As a result, about 7,500 volunteer officers were received into the Navy. At first, most of these were professionals — men who worked the lakes, rivers and oceans in their civilian trades. But later many were ordinary landsmen who were trained to do a wartime job. A similar situation prevailed within the enlisted ranks. At the beginning of the War, there were only about 7,600 enlisted men to which were added about 100,000 volunteers. The volunteer Reserves were the backbone of the Navy during this period. At the end of conflict, most of these volunteer enlisted men and officers returned to their homes and civilian jobs, leaving the Navy once again comprised almost entirely of career-minded regulars.[3]

For the next twenty years, the Navy was so concerned with its own survival that it showed no interest in a Naval Reserve, forgetting the important part the Naval Reservists had played

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[3]Strivers, R.E., Privateers and Volunteers, Naval Institute Press, Annapolis 1975.

during the Civil War. However, with the Naval revival of the 1880's, a number of Naval officers and civilians began to see the need for some form of reserve force. In the absence of Federal Government action, the states formed their own Naval Militia. Massachusetts took the lead, forming its militia in 1888. Many other states followed and supported their militia with ships of their own. For example, the California Naval Militia had the use of the small cruiser Marblehead. The uses for these naval militia were never really established — some saw them purely for coastal defense, others as supplements to the regular Navy — until the war with Spain in 1898. In all, about 4,000 naval militia were sent by their states to augment the 15,000 officers and men of the Navy. These reservists served in both coastal defense and in fighting ships off Cuba.

When the War ended and the militia departed, the Navy saw the need for an organized Federal Naval Reserve and for the first time began pressing Congress to establish such a group. But Congress was slow to act and the state naval militia continued until after World War I. However, in 1912, Congress established a naval medical reserve corps and followed with the piecemeal establishment of other reserve groups until a law passed on 29 August 1916 formed the Naval Reserve Force.

There was barely time for this Reserve Force to become organized, since the United States entered World War I only

a few months later. Once again, the Reserve strength proved invaluable to the Navy in meeting its wartime mission. The still-active state militia provided about 13,000 officers and men while the new Naval Reserve Force provided another 330,000 officers and men. Almost all the Navy's aviation and all 12,000 women in the Navy were Reservists. It was one of the ironies of the war that the Reservists, assigned to the submarines and other smaller craft, saw most of the action while the Navy regulars, being assigned to the larger combatants, saw very little. To a very large extent, history repeated itself in WW II with reservists manning as much as 95% of the most dangerous sea and air assignments.

The Navy, and consequently the Naval Reserve, fell upon hard times after World War I. The state naval militia were abandoned, but finally legislation in 1925 established the air reserve and revitalized the entire Naval Reserve establishment. By 1938, there were 11,000 officers and 13,000 men in the United States Naval Reserve.

This healthy growth of the Naval Reserve barely preceded the dramatic buildup of the Navy for World War II. The Naval Reserve began to report for duty as early as 1940, thereby sparing the Navy of depending on the draft for personnel. Not until after Pearl Harbor did any draftees enter the Navy and even those were enlisted as members of the United States Naval Reserve. The Navy grew to three million during this period. Of the 320,000 officers on duty in 1945, all but

approximately 13,000 were Reservists. These figures point out rather explicitly the important role which the Naval Reserve played in the course of World War II.

It has only been since demobilization from World War II that the Naval Reserve had come into its own, ready to assume a role as a full partner with either the peacetime or wartime regular Navy. Naval Reserve Training Centers were built all over the country and the Naval Air Reserve Training Command was established in Glenview, Illinois. For the first time, regular Navy ships were assigned to Reserve training duty. One of the most important programs instituted during this post-war period was a massive recruiting effort which brought thousands of veterans and men too young for World War II into the Reserve. In 1948, this period of favorable growth was climaxed by the signing by President Truman of a bill providing retirement benefits for Reservists.

The tremendous growth and maturity of the Naval Reserve during this post-war period played an important part in the Reserve's ability to meet the challenge of the many conflicts which have faced our nation since World War II. After providing some 2,000 Reservists to aid in the Berlin Airlift, the Reserve was again ready to do its part during the Korean War, ultimately providing 23 percent of the enlisted men and 60 percent of the officers who served in that War. Praising the performance of the Naval Air Reserve during this War, Vice Admiral H. M. Martin, then Commander of the Naval Air

Force, Pacific Fleet, said, "Never before has our country realized such dividends from a peacetime training program."[4]

In recent years, the Naval Reserve has continued to play an important role in the country's defense, but that role has taken on a changing character. During the Cuban Missile Crisis of 1962, President Kennedy used several thousand Reservists who were on their annual training duty to augment the regular forces. This allowed the President considerable flexibility in using the country's armed forces without the provocation of an all-out callup. Likewise, in the Vietnam War, many Reservists were called to active duty to augment the regular Navy, but this time, many of them saw little action, usually serving in stateside desk jobs. This switch to the "domino theory" of troop deployment allowed the more highly trained forces serving outside the war zone to augment troops already in the War. The Reservists, while seeing a minimum of actual combat, had nonetheless fulfilled an important mission for the war effort by freeing regular Naval personnel.

B. BIRTH OF THE SEABEES

Although there are many examples in Navy history when sailors with building skills were used to do construction work on land bases, it wasn't until the emergency of World War II

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[4]Ibid.

that the Seabees were born as an integral unit of the United States Navy. It was a birth of necessity. During the buildup of overseas bases which preceded the War, the Navy had followed its long standing policy of contracting the construction activity to civilian firms who used their own civilian employees on the job. However, as the Germans in Europe and the Japanese in the Pacific began to expand their empires, the undesirable effects of this policy became evident. By law, civilians in war zones are not allowed to make any resistance; to so do is to designate themselves as guerrillas and risk immediate execution (some civilian workers were in fact executed). Additionally, these civilians lacked the military training and expertise to make any significant resistance.

Recognizing the need for military construction units, the Chief of the Bureau of Yards and Docks, Admiral Ben Moreell, organized support for and received permission to form in 1942 three construction battalions, the purpose of which was to construct advance base facilities while resisting enemy operations. These Seabees then, were fighting construction men.

Because emphasis was placed on recruiting men from the construction fields, the first Seabee units were highly skilled volunteers. Later in the War, however, men of few or no skills were enlisted and had to be completely trained, both professionally and militarily. These men were eventually organized into 190 construction battalions which

deployed to all military fronts and built more than 400 advanced bases, some of which were large enough to house 50,000 men. In addition, the Seabees participated in almost every amphibious assault, assembling pontoons and causeways and handling ship offloading.[5] The Seabees, although a new organization, became highly respected for their invaluable contribution to the War effort.

After World War II, the Seabees were demobilized along with the rest of the armed forces and dwindled to only 2,800 men by June 1950. However, this post-war period, being one of considerable growth for the Naval Reserve, saw the organization of the Reserve Seabees as a complement to their active duty counterparts. These Reserve Seabees were mostly World War II veterans who contributed a great deal of experience and professionalism to the fledgling units. By the time the Korean War erupted in 1950, these Reserve Seabees, although small in numbers, were able to assist substantially in the rapid expansion of the small active Seabee forces which were necessary for the War. The experience and leadership provided by these veteran Reserves enabled the Seabees to accomplish major construction projects and to carry out support of amphibious operations for the War.

Since the cold war had created a necessity to maintain military strength and preparedness, there was no rapid

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[5]Naval Construction Forces Manual, p. 315, February 1978.

demobilization at the end of the Korean War. The Seabees remained strong as did the Reserve Seabee organization. However, their mission turned to one of peacetime construction and humanitarian relief. While the active duty Seabees built bases all over the world including the Cubi Point Naval Air Station in the Philippines and the installation of the first Nuclear Reactor Power Plant at McMurdo Station in Antarctica, the Reserve Seabees concentrated on preparing their mobilization readiness through a structured training program, much of which consisted of Self-Help habitability and Community Service projects.

These peacetime projects and training gave valuable practical experience to both the regular and Reserve Seabees which prepared them for the role they were to play in the Vietnam War. The first Seabee battalion arrived in Vietnam on 7 May 1965. As the War escalated, all active duty battalions were rotated to service in Vietnam and nine battalions were reactivated. This buildup culminated in 1968 in the call to active duty of two Reserve Construction Battalions. These units, being mobilization ready and highly trained, were able to deploy to Vietnam and to produce results almost immediately with a minimum of disruption to the shore establishment or the active forces. When these two units were sent back to inactive status over a year later, they had again proven that the Reserve Seabees were ready to perform as an integral part of this country's armed forces.

C. TOTAL FORCE CONCEPT AND THE RESERVE SEABEES

The defense of the United States in the 1970's and 1980's continues to rely heavily on the Naval Reserve through the "Total Force Program". Under this concept, future buildup of military forces during national crises will come from manpower and assets of the Reserves without the immediate recourse to the selective service system unless Congress reinstitutes the draft. The rationale behind this policy is to protect the country with forces in being while minimizing the cost to the taxpayer. The emphasis is a total management and integration of the active and Reserve forces to maximize the combat capabilities of the total force. This idea has prevailed in our Reserve structure in the past but management of it was lacking. Today's Reserve is structured so as to work alongside its active duty partner.

In keeping with this precept, the Reserve Seabee organization has command responsibility to the Chief of Naval Reserve, who administers the entire Naval Reserve Program. Figure 1 shows the organization chart of the Seabee Reserve. The Commander, Reserve Naval Construction Force, administers the eight Reserve Construction Regiments and the seventeen Reserve Construction Battalions as well as various public works and Construction Battalion Center augment units. It is interesting to note that this organization is self-contained and separate from the other Reserve organizations who have command responsibility through the Readiness Commands located

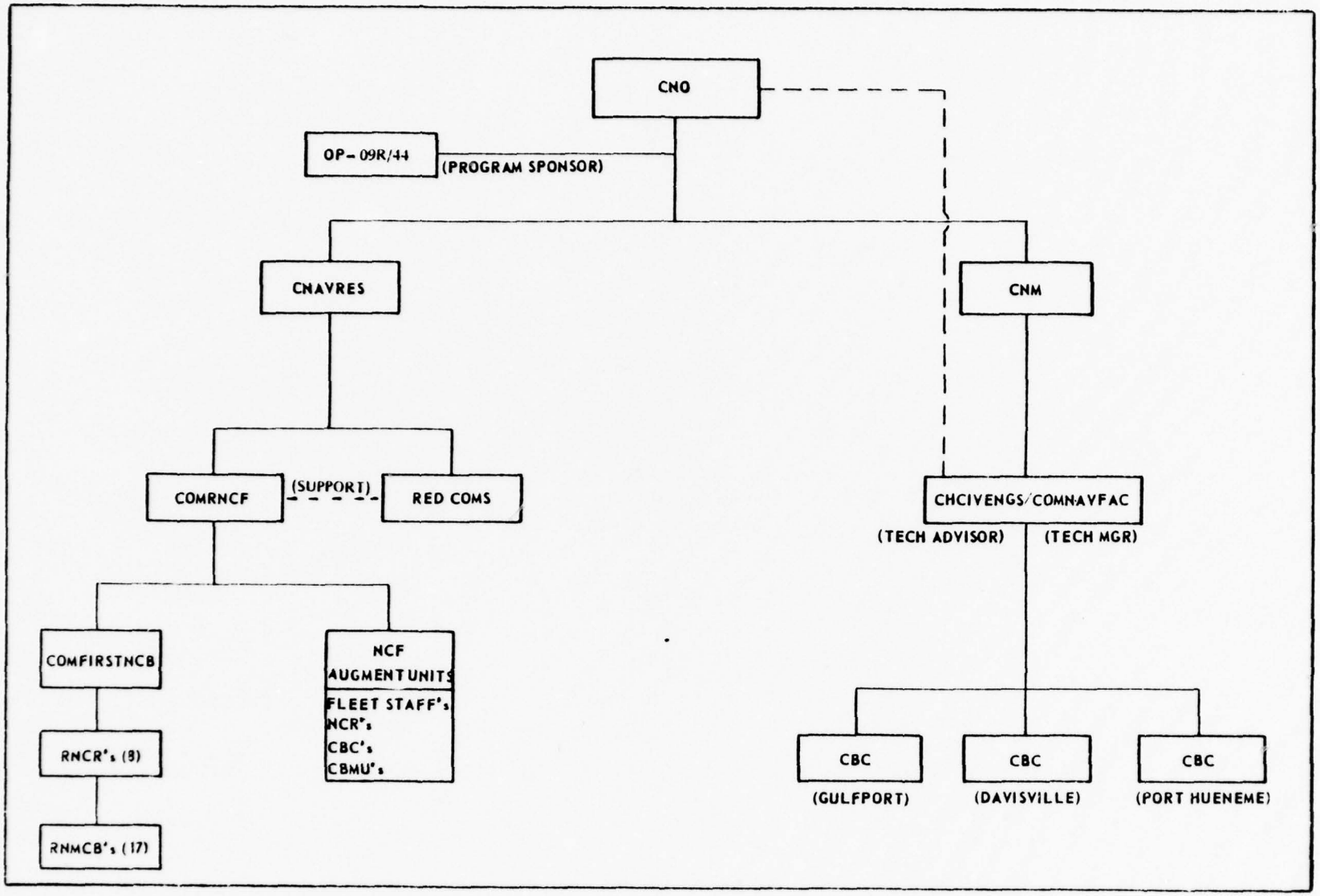

Figure 1
Reserve NCF Organization

around the country. The Seabees receive only administrative support from these REDCOMS. The Seabees, therefore, operate identically and work very closely with the Commander, Naval Facilities Engineering Command, who is the technical program manager for the Seabee Reserve. Working together so closely in this manner, the two organizations, both active and Reserve, are better able to plan the readiness and capabilities of the total Construction Force.

Units of the Reserve Construction Force conduct inactive duty for training (weekend drills) at the detachment level at various Naval Reserve Training Centers and at the battalion level at designated battalion Permanent Drill Sites (PDS). These PDS's house portions of an active duty equipment and tool allowance which are utilized in readiness training. The two-weeks Active Duty for Training periods are usually conducted on the regimental level at one of the Construction Battalion Centers. During all periods of training, the Reserve Commanding Officers of each battalion exercise full staff operational control and are responsible for attainment of the training goals established by COMRNCF in conjunction with COMNAVFAC.

III. COSTS OF TRAINING RESERVE AND ACTIVE DUTY SEABEES

A. UNAFFORDABLE LUXURY OR BARGAIN?

Costs are usually the main reason behind proposed reductions of the Reserve. Harold W. Chase, Deputy Assistant Defense Secretary for Reserve Affairs, while testifying before the Senate Armed Services Committee's Manpower and Personnel Subcommittee, admitted that cost reduction is the reason for proposed cuts in the 1979 Reserve budget, saying, "The move would save $60 million and is a judgment call." In absolute terms, the cost to maintain the Reserve is considerable. For fiscal year 1977, the Department of Defense estimate of personnel costs alone for the six Reserve and National Guard components was in excess of $1,639 million. It is apparent that the Reserve budget is a substantial expenditure which deserves careful control and consideration. But at the same time, it is argued that the Reserve is a wise investment. Proponents of a strong Reserve point out that it would cost many times more were the 900,000 officers and men of the Reserve Force on active duty. The Reserve is a bargain, they argue.

Just how much of a bargain is the Reserve Seabee? This study now turns to a comparison between the costs of training a Reserve Seabee and one who is on active duty. To keep the comparison pure, an E-6 Petty Officer with over 10 years of service has been chosen as the typical Seabee and will be used

as the basis for both parts of the study. It is also assumed that he is married with dependents.

B. COST ANALYSIS OF TRAINING A RESERVE SEABEE

The costs involved in maintaining a Reserve Seabee are of three basic types: pay and allowances, training expenses, and support costs. Perhaps the most obvious of these is pay and allowances, which, for all Reservists, are derived from two sources. He is allowed forty-eight paid drills per year plus a seventeen-day period of annual active duty for training (ACDUTRA). During both these periods of service, he receives a regular salary plus a basic allowance for quarters (BAQ). There is no allowance for subsistence as meals are provided for him at the Naval Reserve Training Center, the Permanent Drill Site or the ACDUTRA site. The fiscal year 1978 daily drill pay rates (each drill is considered one day) for an E-6 Reservist with over 10 years service is $24.94 base pay and $6.74 BAQ. These rates also apply to the seventeen-day period of ACDUTRA. Figure 2 shows the calculations for his yearly pay and allowances, the total of which is $2,059.20.

Figure 2

ANNUAL COMPENSATION – RESERVE SEABEE

	Daily Rate	x	No. Days	Totals
Regular Drills:				
Pay	$ 24.94		48	$ 1,197.12
BAQ	6.74		48	323.52
ACDUTRA:				
Pay	24.94		17	423.98
BAQ	6.74		17	114.58
Grand Total				$ 2,059.20

Although the Reservist does not receive an allowance for his subsistence cost, there is nonetheless a cost to feed him while he is in a drill status and on ACDUTRA. The Reserve Seabee drills one weekend each month and is provided lunch on both Saturday and Sunday. Thus he is fed a total of twenty-four days a year. The current Navy Subsistence Office rate per day is $2.40 or $57.60 per year for drill periods. While on ACDUTRA, the Naval Reservist subsists in the dining hall at his ACDUTRA site at an allowable cost of $3.02 per day. The cost to feed him for the entire seventeen-day period is $51.34. His yearly subsistence cost then is $103.94.

The expense of training a Reserve Seabee is a substantial portion of his maintenance costs. This is not surprising since he receives training at three different locations during the year. He is attached to a Naval Reserve Training Center at which he must perform a minimum of twenty-five drills. The other twenty-three required drills are then spent at his battalion Permanent Drill Site. A third location is required for him to complete his ACDUTRA training. The expenses at each of these locations is calculated in Figures 3, 4 and 5. In each of these Figures, the Administrative Cost category includes administrative and consumable supplies, telephone expenses, vehicle maintenance and similar items. Both operating costs and civilian personnel costs are actual budgeted figures for fiscal year 1978 while the number of Reservists served at the Naval Reserve Training Center is

Figure 3

ANNUAL OPERATING EXPENSE
NAVAL RESERVE TRAINING CENTER

Operating Costs:			
Administrative Cost		$ 28,581.00	
Building Maintenance		12,355.01	
Utilities		23,231.13	
Total			$ 64,167.14
Civilian Personnel Costs:			
One GS-4			7,680.00
Military Personnel Costs (Active Duty):			
Pay Grade	No.	Annual Rate	Total
O-6	1	$ 38,381.00	$ 38,381.00
O-3	1	23,667.00	23,667.00
E-9	1	21,019.00	21,019.00
E-7	5	15,652.00	78,260.00
E-6	6	13,258.00	79,548.00
E-5	5	10,930.00	54,650.00
E-4	4	9,199.00	36,796.00
Total			332,321.00
Grand Total			$ 404,168.14
Number of Reservists Served			400
Average Cost Per Reservist			$ 1,010.42

approximate since the number fluctuates throughout the year. Military personnel expenses have been figured using authorized allowances costed at the Composite Standard Military Rates given in NAVCOMPT Manual, Volume 3, paragraph 035750. The costs of the Naval Reserve Training Center are those of the Center in Phoenix, Az. It is typical of the many Reserve Training Centers around the country which train Reserve Seabees.

Figure 4

ANNUAL OPERATING EXPENSE
PERMANENT DRILL SITE

Operating Costs:

Battalion	Location	OPTAR	Support Cost	
2	Treasure Island	$ 29,175	$ 3,765	
12	CBC Davisville	32,278	10,000	
13	Camp Smith, NY	28,442	3,700	
14	NAS Jacksonville	46,235	6,230	
15	Richards AFB MO	33,485	3,580	
16	NAS Los Alamitos	31,627	-0-	
17	CBC Port Hueneme	29,570	-0-	
18	NSA Seattle	31,285	-0-	
20	Columbus AFB OH	28,430	5,396	
21	NAS Lakehurst	37,570	15,000	
22	NAS Dallas	30,500	-0-	
23	Ft. Belvoir	65,899	8,744	
24	Redstone Arsenal	27,300	20,637	
25	NTC Great Lakes	26,620	8,452	
26	NAS Glenview	34,390	-0-	
27	NAS Brunswick	53,306	5,039	
28	NAD MacAlister	22,200	2,400	
Totals		$588,312	$ 92,943	$681,255

Civilian Personnel Costs: -0-

Military Personnel Costs:

Pay Grade	No.	Annual Rate	Total	
E-9	5	$ 21,019	$ 105,095	
E-8	8	18,070	144,560	
E-7	8	15,652	125,216	
E-6	45	13,258	596,610	
E-5	17	10,930	185,810	
E-4	17	9,199	156,383	
Total				1,313,674

Grand Total $ 1,994,929

Number of Reservists Served 14,552

Average Cost Per Reservist $ 137.09

Figure 5

ANNUAL OPERATING EXPENSE
ACDUTRA LOCATION

Operating Costs:

Location	No. of Battalions	Support Agreement	
CBC, Gulfport	10	$ 249,800	
Ft. Drum, NY	1	17,000	
CBC, Port Hueneme	4	59,150	
Quantico	1	5,150	
Camp Lejeune	1	6,000	
Total			$ 337,100
Travel to and from ACDUTRA			900,000
Civilian Personnel Costs			-0-
Military Personnel Costs			-0-
Grand Total			$1,237,100
Number of Reservists on Training			14,552
Average Cost Per Reservist			$ 85.04

Each of the seventeen Reserve Seabee battalions has its own Permanent Drill Site, the locations of which are enumerated in Figure 5. The expense of operating these sites is two-fold. Each battalion receives an annual operating target which finances the administrative costs and maintenance of the site. In addition, a support agreement is negotiated with most host activities to pay for utilities and other services provided to the sites. There are no civilian personnel at the PDS's but each has a complement of active duty Navy men to

assist in training and to man the site between drill weekends. The costs of all the sites is totaled and divided by the approximate number of officer and enlisted Reserve Seabees to get an average cost, a procedure which eliminates regional costs differences.

The five ACDUTRA sites used by the Reserve Seabees are listed in Figure 5. A support agreement is negotiated with the host location to cover the cost of some training received, supplies used and utilities furnished. The agreement also includes a portion of each location's overhead, into which is added the civilian and military personnel costs of the base. Thus no separate personnel costs are shown. An additional cost for ACDUTRA is the expense of transporting personnel from their homes or Reserve Centers to the ACDUTRA site. This cost for fiscal year 1978 is estimated to be $900,000. The $85.04 ACDUTRA training cost brings to $1,232.55 the total of training a Reserve Seabee for fiscal year 1978.

The remaining category of Reserve Seabee maintenance costs is for support of the Reserve Regimental and Brigade staffs within the Seabee organization. Each Reserve Regiment receives an operating target with which it purchases administrative and office consumables. They have no other office support costs since they are located in various Naval Reserve Centers around the country; nor are there any additional civilian or military personnel costs. Figure 6 enumerates

Figure 6

ANNUAL OPERATING EXPENSE
RESERVE REGIMENTS

Operating Costs

Regiment	OPTAR
1	$ 2,990
2	3,550
3	5,310
5	3,450
6	2,900
7	7,105
8	2,970
9	4,300
21	5,620
Total	

Total	$ 37,895
Civilian Personnel Costs	-0-
Military Personnel Costs	-0-
Grand Total	$ 37,895
Number of Reservists Served	14,552
Average Cost Per Reservist	$ 2.60

the Regiments and their costs. Figure 7 shows the costs of the First Reserve Naval Construction Brigade, which administers the entire program from its offices in Kansas City, Mo. In addition to administrative and utility costs, this office has both civilian and active duty Navy personnel who assist the Reserve staff in administering the program. The total support cost for both staffs is $46.23 which, when combined with pay and allowances, subsistence and training costs,

Figure 7

ANNUAL OPERATING EXPENSE
FIRST RESERVE NAVAL CONSTRUCTION BRIGADE

Operating Costs:			
Administrative Costs		$ 130,000	
Utilities		4,508	
Total			$ 134,508
Civilian Personnel Costs:			
Four GS-7's @ $13,569/year			54,276
Military Personnel Costs:			
Pay Grade	No.	Annual Rate	Total
O-5	1	$ 32,045	$ 32,045
O-4	6	26,886	161,316
O-3	1	23,667	23,667
E-9	1	21,019	21,019
E-8	1	18,070	18,070
E-6	8	13,258	106,064
E-5	6	10,930	65,580
E-4	2	9,199	18,398
Total			446,159
Grand Total			$ 634,943
Number of Reservists Served			14,552
Average Cost Per Reservist			$ 43.63

brings the total maintenance costs for an individual Reserve Seabee to $3,446.92.[6]

[6]All cost data was obtained from the NAVCOMPT Form 2171, Budget Classification/Functional Category/Expense Report – COMFIRSTRNCB and the NAVCOMPT Form 2199; Trial Balance – COMFIRSTRNCB, both produced monthly by the Navy Regional Finance Center, San Diego.

C. COST ANALYSIS OF TRAINING AN ACTIVE DUTY SEABEE

The costs to maintain a Seabee on active duty fall into the same three basic categories as those for a Reserve Seabee. As is the case in the previous cost analysis, the pay and allowance category is the largest of the three. An E-6 Petty Officer with over ten years active service receives $748.20 per month in base pay and a BAQ allowance of $202.20. For purposes of this study, it is assumed that he is not authorized to receive a separate ration allowance, but rather is required to subsist in the Navy general mess while on duty. In addition, active duty enlisted personnel receive a monthly clothing allowance, the amount of which is $8.10 for an E-6. (A Reservist does not receive this allowance.) For the entire fiscal year, the total pay and allowances received by the active duty E-6 Seabee is $11,502.00.

Even though the E-6 Petty Officer addressed in this study does not receive a subsistence allowance, it nevertheless costs the Navy to feed him while he is on duty. The present Seabee spends approximately five months, or twenty-two weeks, of each year in his battalion's home port. It is assumed that during this time, he will eat breakfast and lunch in the general mess five days a week, or a total of 110 days. The current allowable daily rate for breakfast and lunch is $1.81. (This rate is the amount that the general mess is allowed to spend per man in preparing its meals.) Therefore, it will cost the Navy approximately $199.10 to feed him during

this period. The cost is greater during the other thirty weeks that his battalion is deploying overseas. Since he is away from home, it is assumed that the average Seabee eats all three meals each day in the general mess. The deployed rate of $3.12 per day amounts to $651.00 for the 210 day period the Seabee is away from homeport. The annual cost to feed an active duty Seabee, therefore, is $850.10.

The active duty Seabee receives all of his training through his battalion, which undergoes intensive exercises while in homeport. During deployment, the battalion undertakes numerous construction projects, all of which give the Seabee valuable on-the-job training. There are also some specialized schools utilized during the homeport period which are paid for out of battalion funds. Most of the cost of operating a battalion, therefore, is in the nature of training, the remainder being for administrative support costs. For clarity and convenience, the entire battalion operating target is considered training. Rather than examining only one battalion's funds, the cost of operating all four battalions serving under the Commander, Construction Battalions, Pacific (CBPAC) is used to determine the average cost per Seabee. This procedure is thought to eliminate the bias inherent in the fact that each battalion receives different target amounts. A more representative average results. Figure 8 shows the calculation of this average. The battalions have no civilian personnel, of course. The military personnel cost of the

Figure 8

ANNUAL OPERATING EXPENSE
CONSTRUCTION BATTALIONS – PACIFIC

Operating Costs	$ 7,209,005
Civilian Personnel Costs	-0-
Military Personnel Costs	-0-
Total	$ 7,209,005
Number of Seabees in the Battalions	3,012
Average Cost Per Seabee	$ 2,393.43

Figure 9

ANNUAL OPERATING EXPENSE
CONSTRUCTION REGIMENTS – PACIFIC AND CBPAC

	Regiments	CBPAC
Operating Costs	$ 2,581,730	$ 285,373
Civilian Personnel Cost	307,525	-0-
Military Personnel Cost	2,018,850	564,370
Totals	$ 4,908,105	$ 849,743
Grand Total		$5,757,848
Number Of Seabees in CBPAC		3,207
Average Cost Per Active Duty Seabee		$ 1,795.40

battalions has been purposely omitted so as to ensure a similar comparison between the total active duty battalion costs and those of a reserve battalion, which also omitted the personnel cost of the reserve members.

The active duty battalions have a support structure very similar to that of the Reserve Seabees. There are two Regiments serving under CBPAC who is in effect the same as the Reserve Brigade Commander. The operating expenses for both the Regiments and CBPAC are shown in Figure 9. The civilian personnel costs of CBPAC are charged to the Regimental civilian personnel figure by the Navy Finance Office, San Diego, and are unretrievable as separate figures. This fact explains the lack of civilian costs for CBPAC. The military personnel costs for both staffs are shown in this case because, just as with the Reserve staffs, these people serve entirely to support the battalions and thus the individual Seabee.

A final area of costs is the support provided by the Construction Battalion Center, Port Hueneme. All four CBPAC battalions are homeported there and receive not only organizational space, but also logistics, personnel and other support. The Center exists solely to support the battalions. Its expenses for fiscal year 1978 are shown in Figure 10. The average $7,107.83 cost per Seabee supported is approximately

Figure 10

ANNUAL OPERATING EXPENSES
CONSTRUCTION BATTALION CENTER, PORT HUENEME

Operating Costs	$ 6,370,026
Civilian Personnel Costs	12,260,192
Military Personnel Costs	3,240,587
Total	$ 21,870,805
Number of Personnel Served	3,077
Average Cost Per Person Served	$ 7,107.83

thirty per cent of the $23,648.76 needed to support an active duty Seabee.[7]

D. SUMMARY COMPARISON

Figure 11 is a summary comparison of the total expenses involved in maintaining both the Reserve Seabee and his active duty partner. The active duty Seabee is approximately seven times more expensive to maintain.

[7]The same reports from the Navy Regional Finance Center, San Diego were used to obtain active duty cost data.

Figure 11

COST COMPARISON
RESERVE AND ACTIVE DUTY SEABEE

Category	Reserve	Active Duty
Pay and Allowances	$ 2,059.20	$ 11,502.00
Subsistence	108.94	850.10
Training:		
Reserve:		
Reserve Center	1,010.42	
Battalion PDS	137.09	
ACDUTRA	85.04	
Active:		
Battalion		2,393.43
Support:		
Regiments	2.60	
Brigade/CBPAC	43.63	1,795.40
CBC, Port Hueneme		7,107.83
Grand Totals	$ 3,446.92	$ 23,648.76

IV. THE BENEFITS ACCRUING FROM THE RESERVE SEABEE

A. THE RESERVE SEABEE'S CONTRIBUTION TO THE TOTAL FORCE

This study has shown that the Reserve Seabee is a financial bargain when compared to the investment required of the active duty Seabee. Quite obviously, history proves that the Reserve is a good investment for our country. However, cost-effectiveness is not the only criteria which should be considered when examining the worth of an organization. Equally important is the contribution made by the Reserve Seabee toward the accomplishment of our national defense through the Total Force.

The Total Force policy has two main goals. First, to insure that adequately trained personnel are on hand and capable of using modern equipment and ready to respond immediately. Secondly, to utilize manpower and material in the most efficient manner possible in order to get the most for the taxpayer's military dollar.

The strategy to accomplish these two goals consists of the creation of a combined active duty and reserve force which is managed as one and which is concerned with the combat capabilities of the Total Force. This strategy recognizes that the needs of deterrence, peacetime presence and immediate response make portions of our defense applicable only to the active forces. However, essential missions must be assigned to the Reserve forces and their capabilities honed to

perfection. The Reserve forces must be trained as actual elements of the active force. The true test, therefore, of the worthiness of the Seabee Reserve is its fulfillment of the Total Force objective.

The Reserve Seabee certainly makes a significant contribution toward the second Total Force goal, lower cost. There are presently about 6,414 Seabees on active duty, or only about thirty-one percent of the total active and reserve construction force of 20,966. The analysis in Chapter Three showed that it costs approximately $20,201.84 more per year to maintain the active duty Seabee. Were the 14,552 Reserve Seabees on active duty, it would cost the country $294,664,038 more per year to maintain the total Seabee force. This cost becomes even more significant when it is considered that a Joint Contingency Construction Requirements Study, recently approved by the Joint Chiefs of Staff, calls for a construction force level significantly higher than the current combined force of actives and reserves.[8] Thus, the more economical Reserve Seabees allow our country to have a greater construction force – one more nearly the size actually required by projected emergency requirements – than were all Seabees required to be on active duty. Our national defense is significantly stronger because of this fact.

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[8]Mantel, James E., RADM, CEC, USNR, "Naval Reserve Seabee SITREP-1978", Naval Reserve Association News, v. 25, May 1978.

The Reserve Seabees receive equally high marks for their training accomplishments and combat capabilities. The Naval Facilities Engineering Command deserves much credit for its support of the Reserve Seabees. NAVFAC, through its role as technical program manager for the Seabee Reserve program, has integrated them into its overall plan and has given them an opportunity to train and learn as full partners. This includes providing expertise and on-the-job training opportunities as well as modern equipment. NAVFAC distributes all new inventory items to both Reserve and active elements. Thus, the training conducted by the Reserve Seabee at his Permanent Drill Site is with the same equipment being used by the active duty Seabee. This constant modernization allows the Reserve Seabees to maintain a high degree of readiness in anticipation of augmenting the active Seabee forces on Mobilization Day.

NAVFAC support notwithstanding, the Reserve Seabees are responsible for planning, developing and supporting their own training. This training is designed to provide diversified specialty and condition capabilities which will allow immediate deployment to any crisis location in the world. To this end, each Reserve Battalion is required to have a specialty, such as horizontal construction, in addition to the primary capability to perform war damage repair, maintenance, operation and construction of critical facilities in support of Navy and Marine Corps fleet units during the initial period of a contingency. Condition training, such

as cold weather, jungle, and desert, is required to meet the "any-where-in-the-world" challenge.

During fiscal year 1978, nine of the seventeen Reserve battalions received advanced military training; four received general construction training; three received operational training, and one received cold weather training. In addition there were detachments training and working in the Canal Zone for jungle experience, in Hawaii and Guantanamo Bay. One battalion also sent detachments to Marine Corps Base, Twenty-Nine Palms Ca for desert training. By the end of the fiscal year, four battalions will have completed air detachment mount-out exercises. These exercises involve preposition and practice in loading an air detachment allowance. Each one of the training exercises was witnessed and reviewed by an inspection team from one of the active duty Seabee regiments. All exercises were given high marks, attesting to the general high level of readiness which exists within the Seabee Reserve. This in turn attests to the capabilities which it contributes to the Total Force.

B. THE RESERVE SEABEE'S CONTRIBUTION TO CIVIC AND OTHER CONSTRUCTION PROJECTS

An equally significant example of the Reserve Seabees' level of expertise and readiness is the construction projects which are accomplished each year for the civilian community and for other Department of Defense components. Accomplished primarily during weekend drill periods, these projects are

mainly construction which the recipients could not finance were it not for the free labor provided by the Reserve Seabees. Construction materials must be provided by the organization requesting the aid since the Seabees receive no funds for this purpose. It should also be noted that no project is undertaken unless it is first approved by the local trade and craft unions. Any possible conflict with them is therefore avoided.

Common among the civic projects are work on Boy Scout or Girl Scout camps, community centers or parks. During fiscal years 1977 and 1978, the Reserve Seabees built an entire 4-H camp in Gretna, Nebraska. This project included planning, site preparation and all construction of buildings and facilities. The 4-H provided only the materials; the Reserve Seabees did the rest. In addition to projects for community groups, the Reserve Seabees did considerable work for other Department of Defense organizations. During fiscal year 1977, several detachments worked two months to grade land and build an airstrip at the Marine Corps Base, Twenty-Nine Palms. While the Marines could obtain money to purchase materials, there were no funds in their budget to provide for actual construction of the strip. Only through the Reserve Seabees' labor could this project have been accomplished. Ranger stations in various National Parks were built during fiscal year 1977 as well as forty miles of fire break lines on the Marine Corps Base, Quantico.

Approximately 350 projects were undertaken by the seventeen Reserve Seabee Battalions during 1977. Considering the numbers of Seabees working on each project and the duration of their labor, it is estimated that over five million man-hours were expended by the Reserve Seabees on these projects during the fiscal year. Costing these man-hours at a conservative $10 per hour rate, it is estimated that at least $50 million of free construction labor was donated to civic and military groups around the country during fiscal year 1977. The total cost of maintaining the 14,552 Reserve Seabees (at $3,446.92 each) is $50,159,580, almost the exact amount of dollar benefit donated on construction projects during the year. When it is considered that each of these projects provides valuable on-the-job training to the Reserve Seabee, the worthiness of the organization is self-evident.[9]

C. BENEFITS OF A RESERVE SEABEE'S CIVILIAN TRAINING

Most Reserve Seabees work in civilian jobs which are the same as or comparable to their reserve military assignments. It is significant to note that the training and experience the Reserve Seabee receives on his job greatly increases his ability to perform his Seabee tasks. The construction capabilities of his battalion are increased as

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[9]The information for this section was obtained through personal interview of several COMFIRSTRNCB Operations Department Officers.

a result. For example, several members of Reserve Naval Mobil Construction Battalion Thirteen, based at Camp Smith, NY were employed as workers during the construction of the World Trade Center in New York City. One of these, a steelworker, actually helped assemble the steel superstructure for the building. Another Reserve Seabee is the foreman of a highway asphalt application crew in Arizona. A very large percentage of the 14,552 Reserve Seabees hold civilian positions requiring similar construction expertise. It is impossible to calculate the dollar advantage accruing to the Naval Reserve from this civilian experience and training. This civilian expertise significantly increases the Reserve Seabee battalions' professional readiness and general capability to further the Total Force objectives.

D. THE ACTIVE SEABEE'S CONTRIBUTION TO THE TOTAL FORCE

It has been shown that the Reserve Seabee costs less than the active duty Seabee. However, the obvious question arises as to the comparative amount of output produced by the two segments of the construction force. Is the amount of accomplishment per man hour relatively the same or is it greater or smaller? Only in this way can a true cost-effective comparison be made. It is now appropriate to examine the contributions of the active duty Seabee to the Total Force.

The active duty Seabee's time is divided between his homeport – one of the Construction Battalion Centers – and an overseas deployment site such as Guam, Okinawa or Diego

Garcia in the Indian Ocean. While in homeport the main emphasis of the active duty battalions is to undergo hands-on training for the types of things which they will be doing on deployment. However, this training is accomplished by formal training such as A, J and C schools rather than by actual on-the-job experience. This situation is the result of strong civilian labor unions in the area of the Construction Battalion Centers which prevent most of the possible significant construction projects which might be accomplished for civic groups and other military organizations. Any such projects must be low profile such as painting the interior and exterior of the CBC chapel and constructing cement block trash enclosures on base. Some major projects are occasionally done at distant military installations such as at Twenty-Nine Palms where an active duty battalion constructed a building. Additional training is completed during the six month in-port period through several military training exercises and through the participation in beach assault exercises at Marine Corps Base, Camp Pendleton. These types of training prepare the active duty Seabee for his overseas duties as well as for possible war mobilization. The in-port period for the active duty Seabee is very similar to the drill periods completed by the Reserve Seabee. There is, however, greater emphasis on formal training and less actual on-the-job experience.

Operations shift to actual construction projects when the active duty battalion deploys overseas where almost one hundred percent of the time if spent on jobs ranging from general repair to new construction. Most of this work is done for other military organizations even though each battalion has a number of ongoing projects at its overseas camp. The four battalions completed approximately 120 projects overseas during fiscal year 1978. Representative of these is the repair and renovation of the enlisted barracks at the Naval Air Station, Atsugi, Japan. The Seabees ripped out the interior of these barracks and replaced all plumbing and wiring as well as completely reconstructing the interior. A more complicated project is the reconstruction of the Navy pier on Okinawa. The wooden and steel piles are being completely replaced and the pier totally remodeled. In all, it is estimated that each active duty battalion will have expended approximately 67,000 mandays of labor during fiscal year 1978. This figure compares to the approximate 36,765 mandays expended on projects by the Reserve Seabees during fiscal year 1977.

V. CONCLUSIONS

A. THE CASE FOR STRENGTHENING OTHER NAVAL RESERVE UNITS

This study has focused on the cost benefits of the Naval Reserve Seabee. It was discovered that the Reserve Seabee costs only about one-seventh the amount required to maintain a Seabee on active duty. Nevertheless, through intensive training planned to provide a variety of specialty and conditional experience, the Reserve Seabees have proven themselves to have a high degree of combat readiness. This training has been supplemented by on-the-job projects for civilian and military organizations, the total labor value of which equals or exceeds the yearly maintenance costs of the Reserve Seabee organization. It was pointed out that additional training expertise is gained by most Reserve Seabees in their civilian jobs, which are similar to their military assignments. All these factors contribute to a high degree of mobilization readiness which has made the Total Force concept a reality within the construction forces of the United States.

The Reserve Seabee organization is in some respects unique, a factor which accounts in part for the high degree of cost effectiveness accruing from this group. However, there are other units in our Naval Reserve which display many of these same positive factors. The Naval Reserve Air Community is one such example. Also reorganized five years ago, it is now comprised of squadrons that are duplicates of

their fleet counterparts. It has enjoyed greater stability than the Naval Reserve in general, primarily because its hardware exists outside that of the fleet aircraft inventory - much like the Reserve Seabee equipment allowance, although in some instances, Reserve aircraft are not up-to-date.[10] It is a striking example of the hardware-oriented type of Naval Reserve which the Total Force Navy requires. Due to the large number of Vietnam veteran pilots who are now members of the Air Reserve, many Reserve tactical squadrons have a significantly higher level of combat experience than their fleet counterparts. Also, a large percentage of Naval Air Reservists are commercial pilots in their civilian jobs, thereby bringing a high level of training and current experience with them to their military assignments.

The Air Reserve has been assigned specific missions which keeps it ready. Four Reserve air transport squadrons provide airlift support and Reserve requirements with a fleet of thirty C-118 transport aircraft. An affiliation program has led to the establishment of two Naval Air Reserve Force squadrons employing six newly acquired C-9 jet transports.[11] These types of missions significantly increase the contribution of

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[10]"Guard and Reserve in the Total Force Program," Commanders Digest, v. 19, January 1976.

[11]Ibid.

the Air Reserve to the Total Force and contribute to their cost effectiveness.

Similar conditions exist within the Naval Reserve Program 11 subspecialty programs such as medicine and law. Highly trained and skilled in their civilian jobs, these professionals report to Naval Reserve duty capable of performing any job assignment given them. Only military training is required to bring them to full mobilization readiness. The Navy utilizes their expertise in providing medical checkups and care or legal service, both to drilling Reservists and active duty personnel. Recently, a team of Reserve lawyers from the San Diego Readiness Command were formed into a team to provide legal services to active duty personnel stationed at Reserve Centers throughout the Command. Serving mainly during the yearly two-weeks' training periods, this legal team provides a model for the creative use of Naval Reservists to benefit and augment the active fleet. Each such assignment contributes to improved cost effectiveness of the Naval Reserve.

B. ADDITIONAL OPPORTUNITIES OF SERVICE

Many enlightened individuals in our society have for some time tried to focus public attention on the lack of civil defense in this country. They point out that there is no viable plan of action to be followed in case of nuclear attack nor is the general public aware of what precautions or actions it should take in an emergency. This state of

affairs is more alarming when the extensive civil defense plans of some other nations are considered. The Soviet Union has a sophisticated civil defense plan which has been supported through extensive public facilities and educational programs for the Soviet citizens. This country has very little of either.

One possible plan to develop an adequate civil defense in our country is to utilize the Reserve Seabees in developing and implementing a civil protection program. For several years the CEC was the primary military organization charged with civil defense planning, construction and public safety and many Seabee's as well as other Naval Reservists have gone through training programs in Civil Defense. Several factors make the Reserve Seabees especially suited for such public service. Their military training, especially in support of amphibious assault and landings, has given them valuable experience in moving men and equipment which could be transferred to personnel evacuation. Their construction expertise would allow them to clear damage or to provide shelter as the need arose. And their skills at organization and management — as evidenced by their own organization — would seemingly make them highly suited to devising and carrying out such a plan. This proposal must not be carried out, however, at the dilution of their combat readiness and training. Only through maintenance of these capabilities is our Total Force — and our national defense — a workable policy.

C. THREATS TO NAVAL RESERVE SEABEE EFFECTIVENESS

Today's Naval Reserve Seabee Force is continually faced with problems which threaten the effectiveness of the organization. One such threat comes from within the military. A few analysts in both the Department of the Navy and the Department of Defense have suggested reducing the number of Reserve Seabee battalions from seventeen to eight. They reason that in time of crisis, personnel from the civilian construction industry could be conscripted as necessary. They overlook both the failure of this type of construction force in World War II and the fact that civilians would be untrained in military matters and not prepared for combat conditions as is the Reserve Seabee. After three years, proponents of this reduction plan are still intent on seeing it carried out in spite of the OP-605 study released during 1977 which called for more than seventeen Reserve Seabee battalions. During this time, the Reserve Seabee Force has been forced to spend much time defending itself before Congress, thereby reducing its concentration on training and readiness. An additional external threat comes from a Congress which is constantly pressured to institute people-related government programs. One result of this condition has been a reduction in funding for all military organizations and a commensurate decrease in our national defense. During the last seven years, the percentage of our country's budget spent on defense has decreased while the Soviet Union has significantly increased its defense expenditures. It is hoped this paper will help

convince military planners and Congressmen of the strategic and financial value of a healthy Naval Reserve Seabee Force.

The evidence obtained and cited in this paper appears to the author to be ample justification for support of the Seabee Reserve as an integral and necessary part of the Total Force concept.

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